Abstract

Kayardild Morphology, Phonology and Morphosyntax

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Kayardild possesses one of, if not the, most exuberant systems of morphological concord known to linguists, and a phonological system which is intricately sensitive to its morphology. This dissertation provides a comprehensive description of the phonology of Kayardild, an investigation of its phonetics, its intonation, and a formal analysis of its inflectional morphology. A key component of the latter is the existence of a 'morphomic' level of representation intermediate between morphosyntactic features and underlying phonological forms.

Chapter 2 introduces the segmental inventory of Kayardild, the phonetic realisations of surface segments, and their phonotactics. Chapter 3 provides an introduction to the empirical facts of Kayardild word structure, outlining the kinds of morphs of which words are composed, their formal shapes and their combinations. Chapter 4 treats the segmental phonology of Kayardild. After a survey of the mappings between underlying and (lexical) surface forms, the primary topic is the interaction of the phonology with morphology, although major generalisations identifiable in the

phonology itself are also identified and discussed. Chapter 5 examines Kayardild stress, and presents a constraint based analysis, before turning to an empirical and analytical discussion of intonation. Chapter 6, on the syntax and morphosyntax of Kayardild, is most substantial chapter of the dissertation. In association with the examination of a large corpus of new and newly collated data, mutually compatible analyses of the syntax and morphosyntactic features of Kayardild are built up and compared against less favourable alternatives. A critical review of Evans' (1995a) analysis of similar phenomena is also provided. Chapter 7 turns to the realisational morphology — the component of the grammar which ties the morphosyntax to the phonology, by realising morphosyntactic features structures as morphomic representations, then morphomic representations as underlying phonological representations. A formalism is proposed in order to express these mappings within a constraint based grammar.

In addition to enriching our understanding of Kayardild, the dissertation presents data and analyses which will be of interest for theories of the interface between morphology on the one hand and phonology and syntax on the other, as well as for morphological and phonological theory more narrowly.

Kayardild Morphology, Phonology and Morphosyntax

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List of Abbreviations

A	adjective
ABL	ablative
ACT	actual (not realised)
Adv	adverb
AdvP	adverb phrase
ALL	allative
ANTE	antecedent
AP	adjective phrase
APPR	apprehensive
ASSOC	associative
A-TAM	athematic tense/aspect/mood
COLL	collative
COMP	complementisation
CONS	consequential
CONT	continuous
D	determiner
DAT	dative
DEN	denizen
DES	desiderative
DIR	directed
DON	donative
DP	determiner phrase
DU, du	dual
EMO	emotive
EMP	empathy
fABL	formal ablative
fADDICT	formal addict
fALL	formal allative
fANOTH	formal another
fAPPR	formal apprehensive
fASSOC	formal associative
fAWAIT	formal awaiting
fBORN	formal born
fBOUND	formal boundary
fCAUS	formal causative
fCONS	formal consequential
fCONT	formal continuous
fCOMP	formal complementised
fDAT	formal dative
fDEAR	formal dear
fDEN	formal denizen
fDEPO	formal deportmentive
fDES	formal desiderative
fDON	formal donative
fDU	formal dual
fEND	formal end
fEXS	formal excessive
fFACT	formal factative
fFRM	formal from
fGEN	formal genitive
fGENLIG	formal genitive ligative
fHAIL	formal hail
fHALL	formal human allative
fINCH	formal inchoative
fINY	formal '*iny*'
fINST	formal instrumental
fLADEN	formal laden
fLLOC	formal long locative
fLOC	formal locative
fLWR	formal lower
fMID	formal middle
fN	formal nominaliser
fNEG	formal negative
fOABL	formal objective ablative
fOBL	formal oblique
fOEVIT	formal objective evitative
fORIG	formal origin
fPL	formal plural
fPLENTY	formal plenty
fPRIV	formal privative
fPROP	formal proprietive

fPOSS	formal possessive
fRATH	formal ‘*rath*’
fRCP	formal reciprocal
fREM	formal remote
fRES	formal resultative
fSAME	formal same
fUTIL	formal utilitive
FUNC	functional
FUT	future
GEN	genitive
HALL	human allative
HORT	hortative
IMMED	immediate
IMP	imperative
INC	increment
INS	instantiated
INST	instrumental
LOC	locative
M	morphomic level of representation
N	noun
NEG	negation
NEGAT	negatory
NONVER	nonveridical
NP	noun phrase
NUM	number
OABL	objective ablative
OBL	oblique
OEVIT	objective evitative
ORIG	origin
PL, pl	plural
POT	potential
PRECON	precondition
PRES	present
PRIOR	prior
PRIV	privative
PROG	progressive
PROP	proprietive
PST	past
PURP	purposive
RES	resultative
SABL	subjective ablative
SEVIT	subjective evitative
sg	singular
T	termination
TH	thematic
TH-TAM	thematic tense/aspect/mood
TRANS	translative
UTIL	utilitive
V	verb
VP	verb phrase
Φ	underlying phonological level of representation
Σ	morphosyntactic level of representation

1 Introduction

1.1 Introduction

Kayardild possesses one of, if not the, most exuberant systems of morphological concord known to linguists. Through accidents of history it also possesses inflectional suffixes on verbs which descend historically from case suffixes, and inflectional suffixes on nouns which descend historically from verbs, which are in turn inflected with the suffixes that descend from case. Untangling and comprehending the synchronic state of a system with such a complex pedigree is a fascinating task and is the first key aim of this dissertation.

Kayardild also possesses a phonological system which is intricately sensitive to its morphology, and particularly to language-specific classes which cross cut the divide between noun and verb, root and suffix, and inflection and derivation. Shedding light on the nature of Kayardild's phonology, and it relation to the language's complex morphology is the second key aim.

The approach taken in the dissertation is one of formal analysis, trained upon a comprehensive field of empirical data. The theoretical outlook is one which aims to be catholic, yet to engage with specific theoretical issues of contemporary interest. The hope is that practitioners of most schools of linguistics may find the discussion lucid, the arguments logical and the findings relevant, even though the very complexity of the data calls at times for quite specific and technical formalisms in order to express cogently the analyses which are advanced. At least some portion of the dissertation may be of interest to specialist in the fields of phonetics, phonology, morphology, and syntax, as well as to a broader audience of linguists studying Australian languages, and endangered languages in general.

This introductory chapter is organised as follows. The Kayardild language, its speakers and primary sources are introduced in §1.2; the main novel contributions of the dissertation are mentioned in §1.3, and §§1.4–§1.6 offer an outline of the model of Kayardild grammar which will be developed in later chapters. Notational conventions are tabled in §1.7 and §1.8 presents an outline of the dissertation as a whole.

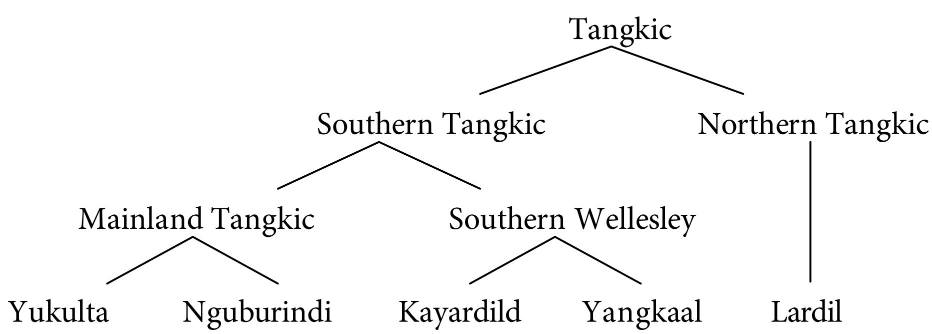
1.2 The Kayardild language, its speakers and sources

Kayardild is a moribund language of the non Pama-Nyungan, Tangkic family, traditionally spoken by the Kaiadilt people of the Southern Wellesley Islands located at the southern end of the Gulf of Carpentaria, off the north coast of Australia. At the time of writing, Kayardild is spoken in its traditional form by just one speaker, aged in her mid-eighties. A cohort of younger speakers, all women of around sixty years of age, speak a variety of Kayardild which is similar to the traditional language, with varying degrees of fluency. For an extended introduction to linguistic situation in recent times, see Evans (1995a:8–50).

The subject of this dissertation is the traditional variety of Kayardild. Throughout the dissertation, speakers of this variety will be referred to as **senior speakers**. Members of the younger cohort will be referred to as **younger speakers**. Members of both sets of speakers self-identify, and identify one another, consistently.

Genetically speaking Kayardild is a Southern Tangkic language, and finds its place within the Tangkic family as shown in (1.1). Kayardild is the last of the Tangkic languages still to be spoken.

(1.1) The Tangkic language family (after Evans 1995a; Round in prep.-a)



The *locus classicus* of Kayardild is Evans' (1995a) descriptive Grammar of Kayardild,[1] a revised version of Evans' 1985 PhD dissertation from the Australian National University. Primarily through this source, Kayardild has become widely known as a language with one of the most exuberant systems of inflectional morphology in the world, a system which will be of considerable interest in this dissertation. Relatively unnoticed until now though, are the intricate relationships which hold between morphology and phonology, which will

[1] Reviews have been published as Dixon (1998) and Majewicz (1999).

also be investigated here. In addition to Evans (1995a), the dissertation takes as its empirical basis three primary sources.

The first is a set of recordings produced during field trips made in conjunction with the preparation of the dissertation. Three seasons were spent working with speakers who at the time were the last four in command of the traditional variety of Kayardild, together with the younger speakers mentioned above. The visits to Bentinck and Mornington Islands took place over two months in 2005, four months in 2006 and three months in 2007.[2] It should be mentioned that during the seasons in the field it was not possible to work with senior speakers of Kayardild in the manner which would typically be characterised as 'elicitation'. Attempts at collecting citation forms of words, for example, proved to be frustrating to elderly consultants, and were discontinued. Emphasis was placed instead on the recording of stories and accounts of traditional knowledge, which were generously offered and delivered as spontaneous speech. Translations of these texts were prepared with the assistance of the younger cohort of speakers, with whom lexical elicitation was also carried out. An early finding was that the inflectional morphology and phonology of the variety of Kayardild spoken by the younger cohort does not always

[2] These field seasons were financed in large part by grants FTG0025 and IGS0039 from the Haus Rausing Endangered Languages Project. Transcriptions of audio and video recordings produced during and after these trips currently run to approximately 14,000 words of spontaneous speech and around 9,000 words of elicitation and general discussion (Round 2005; 2007). All materials have been deposited with the Endangered Languages Archive (ELAR) and are accessible to the linguistic community.

match that of senior speakers, and accordingly younger speakers' forms have not been taken as the basis of description and analysis in this dissertation.

Three other significant sets of recordings of Kayardild exist. The earliest is a set produced by Stephen Wurm over the course of two months in 1960 in conjunction with Kayardild speaker Alison Dundaman (Wurm 1960). In conjunction with the preparation of the dissertation these recordings were transcribed in full for the first time.[3]

Nick Evans has generously made available his complete set of field recordings made by between 1984 and the present. These were transcribed to a lesser extent, and also feature in the dissertation.[4]

Anthropologist Normal B. Tindale collected two sets of recordings of Kayardild, in 1960 and 1963 which are now housed at the South Australia Museum. I have had the opportunity to listen to these, but for logistical reasons they do not form part of the corpus referred to in the dissertation.

Other, secondary sources referred to here will include Tindale's field journals (Tindale 1963; 1960), field notes taken by Ken Hale on Mornington Island in 1960 (Hale 1960a; 1960b), and several works by Evans and colleagues published subsequent to Evans' Grammar (Evans 1995c; 2003; Fletcher et al. 2002; Evans & Nordlinger 2004).

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[3] The recordings run to just over 11,000 words of elicited lexical items and sentences.

[4] Transcriptions currently run to around 4,000 words.

1.3 Novel contributions of the dissertation

In addition to providing confirmation of the existing empirical and analytical treatments of Kayardild, this dissertation makes several new contributions.

A discussion of the phonetics of Kayardild highlights a number of newly recognised phenomena, including a weak realisation of phonologically retroflex consonants, in which the tongue tip is barely retracted if at all; a phonetic contrast between two degrees of retroflexion; and the existence of pre-stopped laterals, though not pre-stopped nasals. A consideration of the phonetics and phonotactics of Kayardild liquids and retroflexes leads to the positing of a class of [+Apical +Dorsal] consonants whose members pattern alike both phonologically and phonetically. An investigation of the Kayardild lexicon reveals a strong tendency towards [±front] harmony of high vowels in adjacent syllables, which can be found manifesting itself also in a slow diachronic drift towards greater harmony, although interestingly, evidence is also found of a productive process of harmony which has recently been lost from the phonological system.

An investigation of the division of words into component morphs leads to a pivotal reanalysis of 'thematic' elements which appear at the boundary between verbal stems and their inflections. Evidence from both the phonology and morphology support a revision of the analysis in Evans (1995a) which shifts the thematic element out of the suffix and into the base to which the suffix attaches. A significant consequence of this is the loss of motivation for an analysis according to which Kayardild was regarded as possessing inflectional suffixes that altered the word class of their base (Evans 1995a; Evans & Nordlinger 2004).

A comprehensive data set documents all attested phonological modifications that apply to underlying segments, expanding significantly upon the coverage in Evans (1995a) and revealing a phonology which is pervasively sensitive to morphological structure. Detailed consideration is given to possible architectural implications of the data, with attention paid to issues which have been of interest in the formal phonological literature over the past three decades. As in many other Australian languages, the phonology of consonant clusters in Kayardild supports an analysis framed in terms of segmental adjacency rather than prosodic (i.e., syllabic) position, but the empirical details fail to lend support to the currently most favoured cross-linguistic explanation for such behaviour, the 'licensing by cue' hypothesis of Steriade (1999a; 2001).

An analysis of Kayardild stress is presented, in tandem with an initial documentation and an autosegmental–metrical analysis of Kayardild intonation. It is argued that certain aspects of lexical prosodic structure are systematically masked by the phonetic properties of breath group edges, and a novel analysis is offered based on a large-scale investigation of breath group internal word tokens. Principal findings are that stress in Kayardild is sensitive to morphological structure, with suffixes often carrying lexical stress on their first or second syllable (suffixes longer than two syllables are rare). An analysis is presented in which trochaic feet are preferentially built closer to the right edge of the word in the lexical phonology, while in the post-lexical phonology, rhythmic feet are built preferential towards the left.

In the domain of Kayardild syntax and inflectional morphology, a substantial body of new empirical evidence is presented. With respect to syntax *per se*, the existence of focus DPs (descending diachronically form erstwhile ergative DPs) is a novel discovery, as is the clitic status of several particles, which align at the very left edge of the clause; in second position; or rarely, in final position. The DP is accorded a somewhat modified analysis relative to the NP of Evans (1995a), and a consideration of DP apposition leads to the rejection of an analysis according to which DPs are sometimes 'split' and discontinuous.

An extended study of inflection reveals an intricate structure to Kayardild clauses which is manifested not in surface word order, but in the constituents whose words inflect for certain features. This line of research continues and expands upon the findings of Evans (1995a), yet at the same time calls for a significant reanalysis. Evans' (1995a) contrast between *associating case* and *modal case* is dissolved, based partly on the finding of a homologous contrast that exists within the *modal case* category, and partly upon a number of non-trivial simplifications which result when the two categories are merged. In the reanalysed system, Kayardild words inflect, in addition to the typologically common features of CASE and NUMBER, for two TENSE/ASPECT/MOOD (TAM) features, a NEGATION feature and a COMPLEMENTISATION feature. Other departures from the analysis of Evans (1995a) include the recasting of *inflectional nominalisation* as the realisation of a TAM feature value, and the treatment of *adnominal case* and *relational case* as the same feature. Arguments are advanced for the existence of DPs embedded within matrix DPs whose NP lacks an N head. These structures, once recognised and integrated into the account of DP apposition, enable the formulation of a coherent and relatively simple analysis of the syntactically and inflectionally most complex phenomena in the language, some of which are identified for the first time here. A section devoted to the topic of morphological recursion offers arguments that truly prodigious, recursive morphological structures in Kayardild are restricted only indirectly, via syntax and perhaps ultimately for processing reasons, but not by any inherently morphological principle.

In formulating these analyses, a general structure of the grammar is proposed for Kayardild in which a 'morphomic' level of representation (Aronoff 1994) plays a central role. Since the structure of the grammar is a matter some complexity, §§1.4–1.6 are devoted to introducing it in some detail.

1.4 On the structure of the grammar, from syntax to phonetic form

Through the course fo the dissertation an analysis of Kayardild is developed in which several distinct levels of representation play a crucial role. Levels are posited in order to capture generalisations which otherwise would go systematically unexpressed. The existence of each will be supported by argumentation at appropriate junctures, and motivated in terms of empirical facts of the language which will be richly exemplified at each point. While the process of analysis and argumentation will be informed and sometimes guided by the theoretical literature, the methodology in the dissertation is not to begin with any given theory and attempt to fit the Kayardild data to it, or to test it against the data, but to let the empirical facts determine the direction of the analysis. Perhaps the one exception to this, is that the analysis of the mappings between one representational level and the next, will be expressed in terms of a grammar built upon ranked, violable constraints as opposed to one of ordered or unordered rules. In the following, §1.5 introduces the levels of representation in the grammar, and §1.6 the nature of mappings between them.

1.5 Levels of representation

The levels of representation which will feature in the dissertation are summarised in (1.2), and introduced in further detail in §§1.5.1–1.5.6 below.

(1.2)

	Level of representation	Nature of the representation
a.	Syntactic/semantic	For each sentence, all word order & related constituent structure, all semantic and discourse relationships between syntactically realised units.
b.	Morphosyntactic	For each syntactic word, a partially ordered set of feature value pairs, selected from a set of six features, each with a finite range of permissible, discrete values.
c.	Morphomic	For each syntactic word, a fully ordered set of categories, selected from a large, but finite set.
d.	Underlying phonological	For each syntactic word, a fully ordered set of allomorph sets,[5] where each allomorph set contains one or more morphs (i.e., phonological strings).
e.	Lexical (surface) phonological	For each syntactic word, a prosodified, phonological string, with morphological structure.
f.	Post-lexical (surface) phonological	For each utterance, a prosodified, phonological string.

A central aim of the dissertation will be to justify the positing of these levels of representation and to furnish an empirically adequate, and insightful analysis of Kayardild in terms of the relationships that exist between one level and the next for each pair of levels in (1.2): <a,b>, <b,c>, <c,d>, <d,e> and <e,f>.

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[5] Allomorph sets are not discussed in this chapter; see however Ch.4, §4.5 for details.

For a number of reasons, equal energy will not be focused on every pair. The most concentrated analytic attention will be directed towards <a,b>, <b,c> and <c,d>; pairs <d,e> and <e,f> will be afforded partial accounts. The decision to focus more comprehensively on some pairs than on others has been guided primarily by the scale of each task, and in the case of the post-lexical phonology (pair <e,f>) by the limited availability of empirical data: an account of post-lexical stress, and of intonation are given in Ch.5, but post-lexical phonology in general is still too poorly understood to warrant a formal account. The lexical phonology (pair <d,e>) is treated non-exhaustively for reasons of space. While the requisite data for a comprehensive analysis of Kayardild lexical phonology now exists, a fully argued, constraint based analysis is a sufficiently substantial task that it is beyond the scope of this dissertation. Instead of a complete formal analysis, a description is given with full exemplification of the sound patterns found in the phonology of the language, and a critical appraisal is provided of how these patterns relate to one another and of how they correlate with morphological structure.

The following sections introduce each level of representation in terms of its contents, the entities which it seeks to represent, and the formalisms and nomenclature which will be used in relation to it.

1.5.1 From syntax and semantics to morphosyntactic features

When a Kayardild word appears in a given syntactic context, with a given semantic force and given discourse function, it will take on an appropriate, **inflected** form. That is to say, its morphological structure, and therefore by extension its phonological structure, will depend in a predictable way on its syntax, its semantics and its discourse function. By the same token, not every syntactic, semantic or discourse distinction that can be made in the grammar of Kayardild will be reflected in the morphology of an individual word. The role of **morphosyntactic features** therefore is to represent precisely the information required by the morphology — no more and no less — in order for a word to be properly inflected. The appeal to a notion of morphosyntactic features, as the distillation of morphologically relevant information taken from the domains of syntax, semantics and discourse, follows something of a consensus position in recent formal, morphological theory. Although individual schools of thought differ as to how such features are derived, how they can be manipulated and what they are named, features of this nature can be found in A-Morphous Morphology (Anderson 1992), Paradigm Function Morphology (Stump 2001), Distributed Morphology (Halle & Marantz 1993; 1994) and in other cornerstone works on formal morphological theory such as Matthews (1974) and Aronoff (1994).

In this dissertation, morphosyntactic features are represented as **feature value pairs**. The 'instrumental' value of the 'case' feature for example is written as CASE:instrumental, in the format FEATURE:value. Each word will be associated with zero or more such feature values. In Ch.6 it is argued that those feature values may in some cases be partially ordered with respect to one another, so that for example {CASE:associative > NUMBER:plural} is not equivalent to {NUMBER:plural > CASE:associative}. Chapter 6 also sets out in considerable detail the nature of the syntactic representations from which morphosyntactic features are derived; these are complex and will not be summarised here.

1.5.2 From morphosyntactic features to morphomic categories

In a significant contribution to the understanding of how systems of inflectional morphology can be organised in natural languages, Aronoff (1994) presents a monograph-length argument that in the general case, morphosyntactic features are realised not directly as phonological forms as shown for example in (1.3a), but rather are interpreted via an intermediate level of representation which is termed **morphomic**, as in (1.3b), where *M* represents some morphomic category.

(1.3) a. CASE:consequential → /ŋarpa/
b. CASE:consequential → *M* → /ŋarpa/

The existence of a morphomic level, which mediates between morphosyntactic representations and underlying phonological forms, is strikingly apparent in the organisation of morphology and phonology in Kayardild. To gain an insight into this aspect of the language's organisation, let us briefly examine a single morphomic category of Kayardild.

Throughout the dissertation, morphomic categories will be labelled according to one of two formats. Morphomic categories corresponding to roots appear as an orthographic form placed in italics, e.g. '*dangka*' corresponding to the root for 'person', realised phonologically as /ʈaŋka/. Morphomic categories corresponding to affixes are given labels in the format 'formal *x*' for some *x* — e.g., 'formal oblique' (fOBL), or 'formal negative' (fNEG).[6]

In Kayardild, the morphosyntactic feature value CASE:oblique is eventually realised, in terms of its underlying phonological form, by a suffix /in̪t̪a/. So too is the feature value TH-TAM:hortative,[7] and the feature value A-TAM:continuous, and the feature value COMPLEMENTISATION:plain. A formal analysis of Kayardild in which these morphosyntactic feature values were all realised directly as underlying phonological forms would fail to capture the rather obvious point of commonality: that they all have the same underlying phonological realisation. To express this, it is assumed here that each of the four feature values is realised at the morphomic level as the formal oblique (fOBL), and that it is the formal oblique — a morphomic category — which is then realised as the underlying phonological suffix /in̪t̪a/. Other generalisations can also be expressed in terms of the morphomic category fOBL, though these need not concern us right now.

One might object that the notion of a 'formal oblique' category as distinct from morphosyntactic feature values is misplaced, and that its postulation follows only from a poor definition of the latter — that is, why not distil the relevant syntactic/semantic/discourse information directly into this fOBL category (and call it a morphosyntactic feature) rather than distilling it first into four distinct feature values and only thereafter

[6] As a convention, if a morphomic category realises a morphosyntactic CASE feature then the *x* in its label 'formal *x*' be the same as the label of the CASE value — e.g. the formal oblique realises the morphosyntactic feature value CASE:oblique, as well as several others.

[7] TH-TAM is short for THEMATIC TENSE/ASPECT/MODALITY, and A-TAM for ATHEMATIC TENSE/ASPECT/MODALITY.

into one morphomic category? The reason for maintaining the distinction between morphosyntactic feature values and morphomic categories again relates to the capturing of significant generalisations. Any attempt to describe coherently the patterns which exist in the distribution of fOBL tokens across the words in a sentence will only be successful if those tokens of fOBL are related back to the morphosyntactic feature values that underlie them: CASE:oblique (realised as fOBL) stands in paradigmatic opposition to other CASE values and shares their distributional properties; TH-TAM:hortative (also realised as fOBL) stands in paradigmatic opposition to other TH-TAM values and shares theirs; and likewise for A-TAM:continuous and COMPLEMENTISATION:plain. Any attempt to conflate morphosyntactic features and morphomic categories in the description of Kayardild decreases the range of facts that can be coherently accounted for and diminishes the insightfulness of the analysis. Moreover, the generalisations which would be lost add up not merely to incidental facts, but to pervasive patterns which are fundamental to the structure of the linguistic system — what in a less prosaic terminology might be regarded as the very 'genius' of the language.

1.5.3 From morphomic categories to underlying phonological forms

At the morphomic level, a syntactic word is represented as an ordered set of morphomic categories. In the mapping from morphomic structure to underlying phonological form, most morphomic categories spell out into a single phonological string which will be referred to as a **morph**, e.g. 'fNEG → /naŋ/'. The linearised string of morphs then constitutes the underlying phonological form of the word.

1.5.4 From underlying to lexical and post-lexical phonological forms

Kayardild phonology will be analysed in terms of a **lexical** component in which phonological modifications apply solely within the domain of single words, and a **post-lexical** component for larger constituents. For the most part no attempt will be made to motivate this division, rather reference is made to the long history within the discipline of positing a distinct representational level corresponding to this dissertation's lexical level, be it the 'phonemic level' of structuralist linguistics or of Basic Linguistic Theory (Dixon 1997; Dryer 2006), the 'surface representation' of early generative phonology (Chomsky & Halle 1968), the 'lexical level' of Lexical Phonology (Kiparsky 1982a; 1982b; Mohanan 1982) or the representational level which in practice corresponds to the phonological 'outputs' of most contemporary research in Optimality Theory. The remainder of this section focuses on the relationship between underlying forms and lexical representations, as this is where the dissertation's phonological focus will lie.

Since the advent of Optimality Theory (Prince & Smolensky 2004[1993]), an important research program within the field of phonology has been the pursuit of a model of phonology in which surface forms are derived directly from underlying representations without recourse to intermediate levels of representation. After a concerted attempt by many in the discipline to realise this goal, consensus opinion appears to have settled recently on the admission that in the general case, seriality actually cannot be avoided altogether (for a detailed review by a formerly leading proponent of seriality-free phonology, see McCarthy 2007:Ch.2).

There are two principle reasons why seriality is argued to be necessary or at least desirable in a theory of phonology, the most prominent being the existence of empirical data which exhibit phonological **opacity** (Kiparsky 1971; 1973a; more recently see also McCarthy 1999; Kiparsky 2000; Bakovic 2007; McCarthy 2007). As a cover term, opacity refers to any of a number of relationships between underlying and surface forms whose formalisation requires the positing of some kind of intermediate level of representation, or at the very least something which emulates the effects of one. The second reason relates to empirical data in which certain morphological constituents, or combinations of morphological constituents, undergo different phonological processes than others. The existence of such data has long been familiar to phonologists and in recent decades has featured prominently in the generative theory of Lexical Phonology (Kiparsky 1982a; 1982b; Mohanan 1982), and in serial, constraint based theories which attempt to carry over its main insights, such as Stratal OT (Kiparsky 2000; to appear; Bermúdez-Otero to appear), Derivational OT (Rubach 1997; 2000) and Co-phonology Theory (Orgun 1996; Inkelas & Zoll 2005; 2007). The phonology of Kayardild exhibits both opacity and pervasive sensitivity to morphological factors.

As mentioned earlier, it is beyond the scope of the dissertation to provide a full, constraint based analysis of Kayardild phonology. Accordingly, certain deliberate choices have been made regarding which phonological phenomena to devote attention to. As argued recently by Inkelas (1999), there is a distinct motivation for the phonological analyst to attend where possible to morphologically sensitive exceptions to 'regular' phonological processes, particularly if those exceptions possess a regularity of their own, for it is often exceptions in need of a coherent account which will overturn a phonological analysis based on a selective, regular data set alone. In the treatment of Kayardild lexical phonology in Ch.4, the identification and consideration of morphologically sensitive sub-regularities has been prioritised over the formulation of detailed analyses of any one set of data. The intention in doing so is twofold. Firstly, this should reduce the need for revision of future, detailed phonological analyses, by establisheing a full data set at the outset. Secondly, it allows for the continued discussion of the interface between morphological categories all the way from morphosyntactic features through to surface forms.

1.5.5 On the lack of morphemes

A significant theoretical construct which is absent from the grammatical model outlined here is the **morpheme**. In structuralist linguistic theory, the morpheme is the central unit of morphological analysis, and one which can be thought of as representing of a correspondence between a meaning or function on the one hand, and a phonological form on another. Although the morpheme continues to hold this central role in Basic Linguistic Theory, and although it is often still assumed in research within generative and OT phonology, it has been absent from most theoretical approaches to formal morphology to have emerged over the past two decades, following compelling arguments for its abandonment due to Matthews (1974) and elaborated by Anderson (1992), Aronoff (1994) and others.[8]

The approach to morphology in this dissertation sides with recent theory in which morphology, and particularly inflectional morphology, is viewed as **realisational**. That is, representations at one level are realised as (or spelt out as, mapped onto, or placed in correspondence with) representations at another level. Although the mapping between

[8] These issues are related specifically to Australian languages in Koch (1990).

elements on one level and the next may involve certain one-to-one correspondences, they may, and do involve more complex relationships also. Moreover, the mapping between meaning or function at one level, and phonological form at another, may be mediated by additional levels of representation.

In many languages, the most compelling evidence in support of the realisational view of morphology can be found in the existence of significant and systematic departures from one-to-one mappings between function and form (Matthews 1974). In Kayardild, the evidence comes not so much from this source as from the need for an intermediate (morphomic) level of representation. In the analysis of Kayardild morphology presented in the dissertation, the greatest points of departure from Evans (1995a) ultimately originate in difference between Evans' morphemic approach to mophology and the realisational approach taken here.

1.5.6 Regarding non-concatenative morphology

As mentioned just above, the principle motivation in Kayardild for adopting a realisational approach to morphology comes from the need for an intermediate level between function and form, and not from the existence of complex correspondences between elements in adjacent representational levels. In Kayardild the mappings between elements on adjacent levels is typically one-to-one, with occasional many-to-one and one-to-many mappings, but never the complex, many-to-many relationship which characterise languages with distinctively non-concatenative morphology. As a consequence it will be possible, and convenient, to make use of the trope of 'ordering' to describe structural relationships that hold between elements within earlier levels, which are realised eventually as actual linear ordering of elements at the phonological level — for example, a typical mapping will be described as holding from 'ordered' morphosyntactic features, via 'ordered' morphomic categories, to (actually) ordered underlying phonological forms. Two remarks are offered with respect to this practice. Firstly, it is assumed that 'ordering' in earlier levels could equally be represented in any form which maintains transitivity and asymmetricality in the relationships between elements in a representation — other, alternate formalisms would include hierarchical structures, or nested, bracketed structures for example. Secondly, because Kayardild does not call for them, the formalisms employed in the dissertation will not always be obviously compatible with the analysis of non-concatenative morphology. The tacit intention is to posit all formalisms in a flexible enough manner that such compatibility could be incorporated at a later date, in order to apply them to other languages, but that task itself is left for future research. In the context of this appraoch, an inevitable, standing caveat must be offered, that future research may identify reasons to revise the formal apparatus employed here in ways that in turn suggest alternate analyses of the Kayardild data. To the extent that this would allow for further insights and discoveries to be made, it can only be a welcome prospect.

1.6 Mappings between levels: Constraint based grammar

In addition to an adequate set of representational levels, we will require a method of relating representations to one another across those levels. To this end, the dissertation will employ an approach based on Optimality Theory (OT, Prince & Smolensky

2004[1993]). Some of the specific assumptions of OT will be set aside, but the general, constraint based architecture of the grammar is essentially the same. The following sections discuss the basic elements of the constraint based approach in §1.6.1, the use of tableaux in ranking arguments in §1.6.2, assumptions made regarding constraints, inputs and language universals in §1.6.3, about the format of constraints in §1.6.4, the ranking of constraints in §1.6.5 and the nature of output candidates in §1.6.6. The reader who is well versed in Optimality Theory may wish to glance at §§1.6.3; 1.6.6 and otherwise skip ahead to §1.7

1.6.1 Basic elements of a constraint based grammar

A constraint based grammar is divided into one or more levels, at each of which one representation, the **input**, is mapped to another, the **output**. The mapping is achieved via the selection, given an input, of an **optimal output candidate**, chosen from amongst a large candidate set. This is quite different from rule based mappings, where the output is derived from the input via a set of processes applied to it, usually in a serial fashion.

The process of selecting an optimal output candidate is fundamentally comparative: each candidate is evaluated according to certain yardsticks, and the candidate which performs better than all others — the **winning candidate** — is chosen. The nature of the 'yardsticks' is as follows.

Candidates are compared against one another in terms of the degree to which they possess various desirable traits. Those traits may be expressed purely in terms of the output candidate itself — for example, 'the output must not contain a sequence [kp]' — or they may be expressed in terms of both the output candidate and the input — e.g. 'the output must not contain any segment which is not present in the input'. Such demands on outputs are formalised in terms of **constraints**. Constraints which evaluate an output candidate on its own terms are termed **markedness** constraints; constraints which evaluate an output candidate in terms of its similarity to the input are termed **faithfulness** constraints. All constraints are expressed in absolute terms — e.g. '*x* has property *p*', and not '*x* prefers to/ tends to have property *p*' — and candidates are evaluated in terms of whether they **satisfy** each constraint or **violate** it, and if so, to what degree. This gives us in effect a large array, with constraints along one dimension, candidates along another, and cells filled with the evaluation of each candidate by each constraint.

Constraints are **ranked** with respect to one another. This ranking is crucial to the process of selecting a **winning** candidate. First we can note, that given a ranking of constraints, it is possible to take any pair of candidates, *a* and *b*, and to determine which (if either) is **more harmonic** that the other: *a* is more harmonic than *b* if it better satisfies the highest ranking constraint which evaluates the two differently. As such, a pair of candidates will always be distinguished into a more harmonic and less harmonic member unless *every* constraint evaluates both candidates identically.

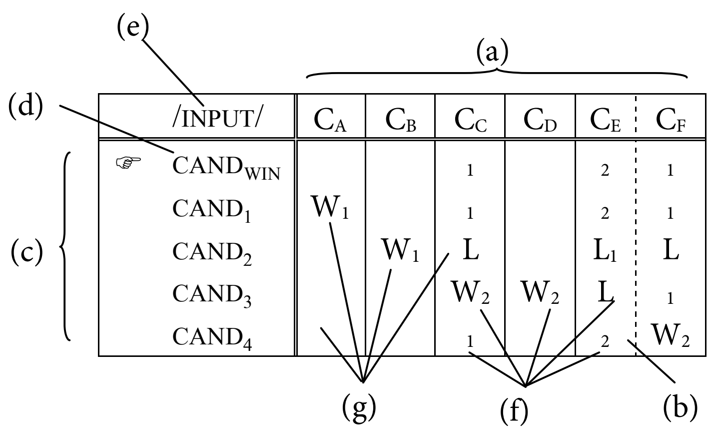
In the overall selection of an output, the winning output candidate is simply that candidate which, in each of its pairwise comparisons with all other candidates, is always the more harmonic. Given that the relationship 'more harmonic than' depends crucially on the ranking of constraints, it follows that the ranking of constraints plays a crucial role in selecting the winning candidate, i.e., the output form.

For the working linguistic analyst, the empirical evidence from a given language supplies a stock of winning outputs. The primary task is then to find an adequate representation of underlying forms, and a constraint ranking which for all inputs leads to the selection of the right output.

1.6.2 Comparative tableaux and ranking arguments

Having arrived upon an analysis, the next task is to argue for it, and to this end some specific tools have been developed, most notably the **tableau** which displays information about constraints, candidates and evaluations. The tableaux used in this dissertation are of the comparative type (Prince 2002), which possess a number of advantages over earlier tableau formats in terms of the clarity with which they present information that is most pertinent to arguments about constraint ranking. A schematic example is shown in (1.4).

(1.4)



Constraints are arrayed in columns (1.4a) from highest ranking at the left to lowest ranking at the right. Adjacent columns that contain constraints which are not crucially ranked with respect to one another are separated by a dashed line (1.4b). Candidates are arrayed in rows (1.4c). The winning candidate (1.4d) is set above all others, with a '☞' symbol pointing to it. The input is placed in the top, left hand corner (1.4e). Individual evaluations, measured in terms of the number of violations of a constraint which a candidate incurs, are placed in the cells of the table, as subscripted roman numerals (1.4f); if a candidate fully satisfies a constraint, no numeral is entered. On the row corresponding to any losing candidate, the comparative performance of that candidate against the winner is shown in the appropriate column for each constraint: 'W' indicates that the winner better satisfies the constraint in question, 'L' indicates that the loser does so, and blank indicates that neither performs better (this can be checked in (1.4): for 'W', the number of violations incurred by the winner is less than the number incurred by the loser; for 'L' the number is greater, and for blank, the number is equal).

Most importantly, the distribution of W's and L's in a comparative tableau highlight the relevance possessed by individual losing candidates, for the ranking of various constraints. Recall that the winning candidate must be more harmonic than every other candidate, that is, in each pairwise comparison it must better satisfy the highest ranking constraint which distinguishes it from another candidate. In terms of the tableau, this means that the *leftmost* unequal comparison (i.e., W or L) in every loser's row must be W — this corresponds to the winner better satisfying the highest ranking constraint which distinguishes it from the loser. With this requirement in hand, we can now make easy reference to explicit ranking arguments as follows.

In tableau (1.5), the comparative evaluation of CAND_2 shows that constraint C_B must outrank constraint C_C. If this were not the case, then the leftmost unequal comparison would not be 'W', in turn indicating that under the constraint ranking proposed, the candidate which should be the winner is not actually the most harmonic.

(1.5)

/INPUT/	C_A	C_B	C_C
☞ CAND$_{WIN}$			1
CAND$_1$	W$_1$		1
CAND$_2$		**W$_1$**	**L**

(1.6)

/INPUT/	C_A	C_B	C_C
☞ CAND$_{WIN}$		2	1
CAND$_1$	**W$_1$**	**L$_1$**	**L**
CAND$_2$		2	W$_2$

Likewise, in tableau (1.6) the comparative evaluation of CAND$_1$ shows that constraint C_A must outrank *both* C_B *and* C_C. Note that these arguments will remain true no matter what other losing candidates remain to be examined. In (1.7), the comparative evaluation of CAND$_2$ shows that constraint C_D must be outranked *either* by C_A *or* by C_C. On the basis of evidence from CAND$_2$ it need not be outranked by both.

(1.7)

/INPUT/	C_A	C_B	C_C	C_D
☞ CAND$_{WIN}$			1	2
CAND$_1$		W$_1$	L	L
CAND$_2$	**W$_1$**		**W$_2$**	**L$_1$**

A constraint ranking can be shown to be inadequate if it contains a contradiction as in (1.8). The comparative evaluations of CAND$_1$ and CAND$_2$ show, contradictorily, that C_B must outrank, and be outranked by, C_C. At that point, the analyst will need to review the proposed constraint ranking in some way. One possibility is to identify another constraint, such as C_D in (1.9) which resolves the contradiction (tableau (1.9) is otherwise identical to (1.8)).

(1.8)

/INPUT/	C_A	C_B	C_C
☞ CAND_{WIN}		1	1
CAND_1		**L**	$\mathbf{W}_3$
CAND_2		$\mathbf{W}_2$	**L**

(1.9)

/INPUT/	C_A	C_D	C_B	C_C
☞ CAND_{WIN}			1	1
CAND_1		$\mathbf{W}_1$	**L**	W_3
CAND_2			W_2	L

An important point illustrated by the comparison of tableaux (1.8) and (1.9) is that ranking arguments pertain to a given, proposed constraint ranking. In the general case those arguments will not survive if constraints are reranked, or if the constraint set is changed.

1.6.3 Assumptions regarding constraint sets and inputs

Optimality Theory is currently the most fully developed, constraint based theory of grammar, but OT and constraint based grammar are not inseparable. In addition to its assumptions regarding the architecture of a grammar, standard OT also adopts assumptions regarding constraints sets and inputs which will not be followed in this dissertation.

In OT, it is usually assumed that all languages employ the same, universal constraint set and that only the individual rankings of each constraint are language specific. In addition, it is assumed that the grammar ought to be able to select a unique output for *any* given input. This would entail for example that the grammar of Kayardild contains constraints relating to clicks, tones and ejective stops, and can generate an output, even when presented with an input as exotic as /t’a⊙/. Recently, arguments have been mounted against this position, to the effect that constraints can be learned and thus need not be provided in advance by an innate universal grammar (Hume & Tserdanelis

2002; Blevins 2004; Pulleybank 2006; Mielke 2008). On such assumptions, the constraint based grammars of individual languages become simpler. In the dissertation, I follow this latter school of thought, and assume that Kayardild grammar ranks only a set of pertinent constraints, which have a visible impact on the selection of winning candidates; constraints proposed in the analysis of other languages need not be part of the grammar of Kayardild. At the same time though, it will be assumed that constraints are of essentially the same *type* as used in contemporary OT. This is expanded upon in §1.6.4.

1.6.4 Constraint types in correspondence theory

A number of basic distinctions among constraints, and basic formats for constraints, will be employed in this dissertation just as in contemporary Optimality Theory. As mentioned above, markedness constraints place demands upon outputs alone, and faithfulness constraints evaluate output candidates according to their similarity to the input. Because faithfulness constraints compare elements in different representations, they are crucially predicated on a notion of **correspondence**, as developed in the component of OT known as Correspondence Theory (McCarthy & Prince 1995). This states that elements in the input and output may stand in correspondence with one another, or not. Faithfulness constraints can evaluate, among other things, whether a given element possesses a correspondent, or whether an element's correspondent is identical to it in some respect. For example, what is traditionally termed 'deletion' can be regarded as a case in which an input element lacks a correspondent in the output. Likewise, 'insertion' can be regarded as a case in which an output element lacks a correspondent in the input, and 'feature changing' a case in which a corresponding pair of elements in the input and output are not identical.

Beyond markedness and faithfulness constraints, **alignment** constraints demand that the edges of certain constituents — for example, prosodic constituents or morphological constituents — be aligned with one another. The use of alignment constraints to produce simple and powerful accounts of prosodic structure has been one of the major successes of OT and of constraint based grammar in general.

Individual constraints are often **parameterised** in order to limit their scope. For example, the basic, unparameterised constraint IDENT demands that corresponding segments be identically specified for all features, whereas the parameterised constraint IDENT(coronal) demands only that they be identically specified with respect to [±coronal]. Incidentally, IDENT constraints are defined so as to be violated only in the case that *corresponding* elements fail to match one another in some respect; if a given element *e* fails to possess a correspondent, then it cannot trigger a violation of an IDENT constraint.

Finally, constraints are sometimes relativised to certain environments, so that IDENT(coronal)/_V demands that corresponding segments be identically specified with respect to [±coronal], if they precede a vowel.

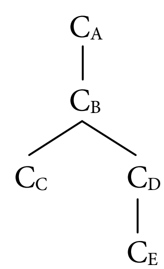
Specific definitions of constraints, and references to their original proposal and their use in Optimality Theory, will been provided at appropriate junctures throughout the dissertation.

1.6.5 Ranking relationships amongst constraints

At the most basic level, constraints can be divided into those which are never violated by winning output candidates — termed **undominated** constraints, on the assumption that no other constraint crucially dominates them; and those which are crucially dominated and therefore violated by at least some winning candidates, in order that a higher ranking constraint be satisfied. Constraint rankings will be displayed in three formats. Within a tableau, the relative ranking of constraints is displayed as discussed in §1.6.2. Otherwise, constraint rankings are listed linearly as illustrated in (1.10a), or as a Hasse diagram (a standard visualisation tool used to represent partially ordered sets), as illustrated in (1.10b), where any two constraints joined by a vertex are crucially ranked, and the uppermost ranked higher.

(1.10) a. || C_A » C_B » C_C, C_D » C_E ||

b.



Because the two dimensional format of Hasse diagrams can represent more complicated relationships between subsets of three or more constraints than the one-dimensional formats can, diagrams such as (1.10b) will be used to represent rankings of relatively large sets of constraints.

1.6.6 Assumptions regarding output candidates

The standard assumption in OT is that output candidates may contain any phonological elements or phonological structure attested in a natural language, and that all of these must be evaluable by constraints. An alternative view is that the set of out output candidates is somehow restricted — for example, it might contain only those segments which occur in output forms in a given language. On the latter view, the set of relevant constraints needed is smaller, since fewer structures need to be ruled out, but at the same time greater restrictions needs to be placed on the component of grammar which generates output candidates (referred to as GEN in OT). The dissertation will not engage directly with issues of this nature, but a tacit assumption which arguably is built into the analysis (at least in the case of mappings between non-phonological levels of representation), is that GEN somehow restricts outputs candidates to those composed of a language-specific set of elements. This would seem to be a reasonable assumption given that non-phonological outputs are composed of elements such as morphomic categories which are unquestionably specific to Kayardild, rather than universal.

1.7 Notational conventions

Notational conventions are summarised below, but will also generally be re-introduced before they begin to be used in any major section of the dissertation.

1.7.1 Representations

All phonological representations are expressed in IPA characters, and may or be not be enclosed in forwards slashes /.../. Phonetic forms are enclosed in square brackets [...]. Morphomic categories appear in the format f*x* (eg. fOBL) or as italicised orthographic forms, e.g. *dangka*. Morphosyntactic feature values are written in the format FEATURE:value (e.g. CASE:locative), and features as a whole are referred to in small caps, e.g. CASE. Sets of feature values are placed in braces, and ordering between them indicate by a chevron '>' , e.g. {NUMBER:plural > CASE:associative}. Also written in small caps are labels for lexical entries, on which see further Ch.3, §3.2.

1.7.2 Categories of analysis

Particularly in Ch.6 extensive comparisons will be made between the analysis of Kayardild in Evans (1995a) and the analysis advanced here. To keep the two distinct, elements of Evans' analysis will be written in italics, e.g. *associating case*, while elements from the current analysis will be written in the usual typeface, e.g. A-TAM:continuous.

1.7.3 Interlinear glosses

Interlinear glosses may contain up to six lines, though often will contain fewer. A maximally explicit example is shown in (1.11).

(1.11)	a.	*Dan-kiy-a*	*kuna~wuna-y-a*	*barji-j-arra-nth- !*
	b.	ʈankia	kunaunaja	paɻcicaran̪t̪a
	c.	ʈan-ki-a	kuna-kuna-ki-a	paɻci-c-ŋara-in̪t̪a-ø
	d.	this-fLOC-T	‹child$_{\text{NL}}$-child$_{\text{NL}}$›-fLOC-T	fall-TH-fCONS-fOBL-T
	e.	this-EMP-Ø	‹child›-EMP-Ø	fall-Ø-PST-COMP-Ø
	f.	‘This child has been born!’ [R2005-jul21]		

The first line (a) contains an orthographic form, divided by hyphens at approximate morph boundaries.[9,10] The remaining lines of a maximally explicit gloss display (b) a surface (lexical level) phonological representation, which is unhyphenated; then (c) an underlying phonological representation; (d) a morphomic representation, and (e) a semantic and morphosyntactic gloss, all of which are hyphenated. For sentential examples, a free translation (f) is given in English and the source of the example is indicated. Examples from the 2005–2007 fieldtrip recordings are identified for example as [R2005-jul05b], referring to the second recording made on July 5, 2005, and labelled 2005-jul05b in the corpus deposited with the Endangered Languages Archive. Examples from Evans’ field tapes are identified for example as [E1984-03-01], referring to the first digitised section of the third tape of the set made in 1984. Examples taken from Evans’ Grammar are identified for example as [E472.ex.11-27], referring to page 472, example

[9] Following the Leipzig glossing rules (Comrie et al. 2003) a tilde is used at reduplication boundaries.

[10] The boundaries in orthographic forms are ‘approximate’ because the divisions between morphs are established at the underlying level, and may be obscured at the surface; and although orthography corresponds closely to surface segmental form, it does not do so exactly. In some case, two hyphens follow one another — this indicates that an underlying morph has been unrealised at the surface.

(11-27). Examples from Stephen Wurm's 1960 corpus are identified as [W1960]. Time alignment and speaker identification data are not displayed, but in the metadata deposited with these corpora (and available from the author on request) each example sentence is transcribed orthographically, and so can be retrieved easily with a text-based search; all transcriptions are time-aligned to audio recordings and associated with speaker metadata.

1.8 Outline of the dissertation

The dissertation is divided into six further chapters. Chapter 2 introduces the segmental inventory of Kayardild, the phonetic realisations of surface segments, and their phonotactics. Chapter 3 provides a general introduction to the empirical facts of Kayardild word structure, outlining the kinds of morphs of which words are composed, their formal shapes and their combinations, as well as several idiosyncrasies which will bear on the analyses of later chapters. Chapter 4 treats the segmental phonology of Kayardild. After a survey of the mappings between underlying and (lexical) surface forms, the primary topic is the interaction of the phonology with morphology, although major generalisations identifiable in the phonology *per se* are also identified and discussed. Chapter 5 examines Kayardild stress, and presents a complete constraint based analysis, before turning to an empirical and then analytical discussion of intonation. Chapter 6, on the syntax and morphosyntax of Kayardild, is most substantial chapter of the dissertation. In association with the examination of a large corpus of new and newly collated data, mutually compatible analyses of the syntax and morphosyntactic features of Kayardild are built up and compared against less favourable alternatives. A critical review of Evans' (1995a) analysis of similar phenomena is also provided. Chapter 7 turns finally to the realisational morphology — the component of the grammar which ties the morphosyntax to the phonology, by realising morphosyntactic features structures as morphomic representations, then morphomic representations as underlying phonological representations. A formalism is proposed in order to express these mappings within a constraint based grammar.

2 Phonetics and surface phonology

This chapter surveys the phonetics and surface phonology of Kayardild. The inventory of contrastive, surface segments and their phonetic realisations are set out and discussed in §2.1. The phonotactics of vowels are treated in §2.2 and of consonants in §2.3. The chapter closes with a summary in §2.4 of the differences between this dissertation and Evans (1995a) in the segmental analysis which is assumed for certain surface forms.

2.1 The segmental inventory of Kayardild

The segmental inventory of Kayardild is typical for an Australian language, featuring (i) a single series of plosives at six places of articulation, four of which are coronal, one of which is dorsal velar and one bilabial; (ii) a series of nasals at the same six places; (iii) three liquids — a trill, a lateral[1] and a retroflex glide; (iv) two semivowels; (v) a vowel system contrasting three qualities and two lengths. The inventory is shown in (2.1–2.2), where the descriptions attached to place and manner follow standard Australianist practice. The

[1] Languages farther west than Kayardild typically contrast more than one lateral; languages in the eastern third of the continent often possess just one (Dixon 1980:143)

IPA symbols convey a typical realisation of the consonants, with the exception that plosive voicing is abstracted away from; symbols for vowels reflect phonological contrasts more than direct phonetic values (see further §2.1.6.1).

(2.1) Surface–contrastive consonants (typical realisations)

	bilabial	laminal dental	apical alveolar	apical retroflex	laminal palatal	dorsal velar
plosive	p	t̪	t	ʈ	c	k
nasal	m	n̪	n	ɳ	ɲ	ŋ
liquid			r, l	ɻ		
semivowel	w				j	

(2.2) Surface–contrastive vowels

i, iː		u, uː
	a, aː	

The remainder of §2.1 discusses the phonetic characteristics of segments in §§2.1.1–2.1.6 after which minimal pairs are presented in §2.1.7.

2.1.1 The phonetics of Australian languages

The languages of Australia exhibit striking similarities in their inventories of contrastive segments (Dixon 1980; Evans 1995b; Hamilton 1996), and the existence of such phonological similarities raises the question of whether the phonetics of Australian languages are also similar, or whether perhaps the similarities in contrastive inventories and a shared descriptive tradition mask an underlying phonetic diversity. These questions define an entire research program which is now being pursued by a small but productive and collaborative group of Australian phoneticians. Especially over the past decade, the field has benefited from the appearance of a number of high quality instrumental studies of various aspects of Australian language phonetics (e.g. Butcher 1995; Butcher 1996; Butcher 1999; Anderson & Maddieson 1999; Tabain & Butcher 1999; Fletcher & Butcher 2003; Tabain & Butcher 2004; Stoakes et al. 2006; Loakes et al. 2008). Notwithstanding recent progress though, it must be recognised that definitive answers to questions concerning the phonetic homogeneity or diversity of Australian languages are still some distance away. The description of Kayardild phonetics to follow is based primarily upon impressionistic observations, and so carries with it the usual potential shortcomings. At some points, impressionistic descriptions are supplemented with initial instrumental results. I report both Evans' observations and my own, and compare these to more precise studies of other Australian languages.

2.1.2 Phonetic characteristics of plosives

The plosives of most Australian languages, including Kayardild, are phonologically contrastive in terms of just one feature, place of articulation; no phonological contrast is made in terms of voicing, length, aspiration or so forth. Stevens and colleagues (Stevens et al. 1986; Stevens 1989; Keyser & Stevens 2006) have proposed though that non-distinctive, phonetic features play a role in enhancing the purely phonological contrasts made within a language's sound system, and it has been suggested in several acoustic studies of Australian languages (e.g. Busby 1979; Anderson & Maddieson 1999; Tabain & Butcher 1999; Stoakes et al. 2006) that duration, voicing and release characteristics, as well as formant transitions and perhaps the duration of neighbouring vowels, all serve together to provide phonetic cues to the phonological distinctions between places of articulation.

The plosives of Kayardild are described below in terms of four phonetic dimensions: the place of articulation of closure in §2.1.2.1, duration in §2.1.2.2, voicing in §2.1.2.3, and release characteristics in §2.1.2.4. Lenited realisations of plosives, in which no full closure is made, are discussed in §2.1.2.5.

2.1.2.1 Places of articulation of closure

We begin with the places of articulation of plosives. What is described here applies equally well for the nasals, which share the same, six-way place contrast. The non-coronal places are discussed first before the four coronal contrasts.

Bilabial /p/ is formed by a vertical compression of the lips with little forward lip protrusion. Dorsal velar /k/ involves a contact between the tongue dorsum and the velum. Coarticulation with neighbouring segments undoubtedly occurs, resulting in slightly different points of contact. Evans (1995a:54) characterises coarticulation in terms of a binary contrast in which [k] appears before non-front vowels and [k^j] before /i, iː/. My impression is that all vowel contexts bear differentially upon the articulation of /k/, as opposed to there being a sharp front/non-front contrast. Tabain & Butcher (2004) find that in several other Australian languages the coarticulation between vowels and /k/ does not follow a binary front/non-front pattern. See also §2.1.4.5 regarding the coarticulation of /k/ (and /ŋ/) with liquids.

The plosive /t̪/ in Kayardild is typically produced via contact of the tongue blade across the back of the upper, front teeth and the post-dental alveolar ridge; the tongue apex is typically lower than the tip of the upper teeth. However, as Evans (1995a:55) mentions for Kayardild and as Butcher (1995) summarises from the descriptions of

Australian languages more generally, the articulation of /t̪/ also departs from this typical realisation. In traditional Kayardild society mature speakers would have lacked some if not all of their upper front teeth. Evans (1995a:55), reports one such speaker articulating /t̪/ in a retracted position, as a laminal alveolar stop. Another speaker, whose articulation is shown in (2.3) below, produces a more advanced /t̪/, namely a laminal labial stop — the token in (2.3) is laminal interlabial, chosen for the visibility of the tongue tip.

(2.3)

Laminal interlabial articulation of /t̪/, at 30 frames/s in the context /a__a/
The tongue tip appears lighter than the upper lip. It can be seen in frames 3–7.

The closure of the apical alveolar plosive is made against the alveolar ridge with the front of the tip of the tongue (which for convenience we may term a **pre-apical** articulation), as opposed to the top of the tongue tip, (which we may term **super-apical**). Butcher (1995) infers similar articulations in five other Australian languages from electropalatographic evidence. In the field I found that an utterance initial, super-apical alveolar articulation of /t/ would be perceived as /t̪/ by speakers in pairs of citation forms such as *dulanda~thulanda* ‘fat~descending’ and *durumatha~thuramatha* ‘deceive~chew’,[2] despite the fact that the super-apical plosives were voiced (as /t/ usually is, cf §2.1.2.3) and not voiceless (as /t̪/ usually is). This suggests that the area of contact between the tongue and the passive articulatory surface is a key component of the articulatory contrast between /t̪/ and /t/ in Kayardild, and is possibly attended to more closely than voicing. The role of contact area as a cue to contrast between /t̪/ and /t/ is consistent with findings from static palatogram data obtained by Butcher (1995), showing that the area of contact in /t̪/ was consistently, significantly greater than in /t/ across five Australian languages.[3]

Although the /t̪/ and /t/ plosives contrast significantly in the area of tongue contact, there is unlikely to be much difference between them in terms of the most posterior point along the alveolar ridge at which closure is made. Consequently, and assuming that the posture of the tongue dorsum is largely the same for /t̪/ and /t/, the geometry of the vocal tract behind the two closures would be very similar, resulting in similar formant transitions during closure and release — such similarities have been reported for other Australian languages (Busby 1979; Tabain & Butcher 1999).

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[2] At least this was so utterance initially and in the absence of disambiguating semantic or pragmatic context.

[3] The depth of contact along the midsagittal line is on the order of two times as great, and the breadth of contact is also greater.

The laminal palatal plosive /c/[4] typically involves a relatively wide area of contact between the tongue blade and post-alveolar or pre-palatal region. Evans (1995a:55) reports that some speakers articulate /c/ 'with the blade of their tongue, others with the tip'. I did not perceive any of the speakers I worked with employing the latter, apical palatal articulation.

In codas, the contrast between the laminals /t̪/ and /c/ is suspended. The plosive which surfaces is categorised as /c/ by Evans (1995a) and will be treated as /c/ in this dissertation, however my impression is that '/c/' in coda position is often articulated significantly further forward than intervocalic /c/, in line with articulations reported by Butcher (1995) for neutralised laminal plosives in several other Australian languages. Butcher argues that the articulation of the neutralised laminal is one which lies between that of the contrastive /t̪/ and /c/.[5]

The articulation of retroflex /ʈ/ is more complex than the articulation of the five other plosives. As for most segments in the world's languages which would be classified as retroflex, /ʈ/ in Kayardild typically involves not only a raising of the tongue tip towards the point of closure, but a retraction of it too. In addition, the tongue dorsum is raised.

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[4] Here I follow recent Australianist convention and use the IPA symbol 'c' for the laminal post-alveolar stop. Earlier Australianist conventions were to use 'tʸ' (predominant in the 1960s), and then 'ṯ' (somewhat later). Ladefoged and Maddieson (1996) use IPA 't̠'. Of the two, most recently emoplyed symbols, 'c' has disadvantages in that it is used outside of Australia primarily to symbolise *dorsal* palatals, whereas 't̠' has the disadvantage that it is typographically nearly identical to 't̪', and so is relatively impractical in a language where /c/ and /t̪/ contrast.

[5] See Butcher (1995) for further discussion of this issue from a theoretical standpoint.

Since the action of retracting the tongue apex requires a significantly longer time than the closure of other plosives, and since the retraction necessarily occurs during the articulation of the preceding vowel, that vowel will typically be perceived as 'coloured' by the retroflex consonant that follows it. Acoustically, an extra resonance corresponding to the sublingual cavity may be present between the usual second and third formant, and higher formants may be lowered (for a recent, extended summary of the phonetics of retroflexes see Hamann 2003). The apical closure itself is almost certainly dynamic: Butcher reports smearing of palatographic traces, consistent with a moving area of contact (1995) in most tokens of /ʈ/ plosives in five Australian languages, and refers to supporting electropalatographic data (Butcher forthcoming). It has been remarked that in faster and in more casual speech, the retraction of the tongue apex in retroflex consonants is reduced (Bhat 1974; Butcher 1995), bring the articulation and acoustics closer to /t/. This appears to be so for Kayardild also. Butcher (1995) finds in several Australian languages that the articulation of apical plosives in word initial position (in which /ʈ/ and /t/ are phonologically neutralised) is similarly realised somewhere between a more typical /ʈ/ and /t/. I have no indication that this last observation applies to Kayardild. On the other hand, it may be that the retraction of /ʈ/ is more variable, and more likely to be reduced, in contexts other than immediately following a stressed vowel (and thus word initial position is one of several contexts of greater variability and reduction).[6]

Because the position of the closure in a retroflex consonant is dynamic, the question arises of how to represent the place of articulation of a retroflex cluster in terms

[6] On this point see also §2.4.2 regarding the 'formal associate' suffix /ɳuru/.

of discrete segments. For example, in the cluster traditionally transcribed as /ɳʈ/, one could argue that the plosive has more in common with an intervocalic /t/ than with an intervocalic /ʈ/, in both articulatory and acoustic terms. On the other hand the sequence '/ɳʈ/' does come across perceptually as a cluster which is homorganic rather heterorganic. In §2.3 (on cluster phonotactics) I find reasons in Kayardild to represent such clusters segmentally as /ɳt/. On that analysis, one can state than in Kayardild, retroflex segments only occur initially in clusters, and not finally. Certain other generalisations regarding cluster phonotactics then follow. This approach to the analysis of retroflex clusters has some commonalities with a recent proposal by Baker and Harvey (2007) that all retroflexes be analysed effectively as contour segments in terms of their the place of articulation — i.e., that even '/ʈ/' is effectively /ʈ͡t/. At this point I have not identified any advantages in applying Baker and Harvey's representation to single retroflex consonants in Kayardild.

2.1.2.2 Duration

Indications are that the factors determining plosive duration (this section) and voicing (§2.1.2.3) are complex, and further study is required. This section and the next offer some initial observations.

Evans (1985:497,500)[7] writes that (i) /ʈ/ is 'either a tap or an extremely short stop'; (ii) /t/ is also short; (iii) /t̪/ is 'much longer'; though (iv) not as long as /p/ or /k/. In addition, the length of the preceding vowel is 'inversely proportional to stop length'.[8]

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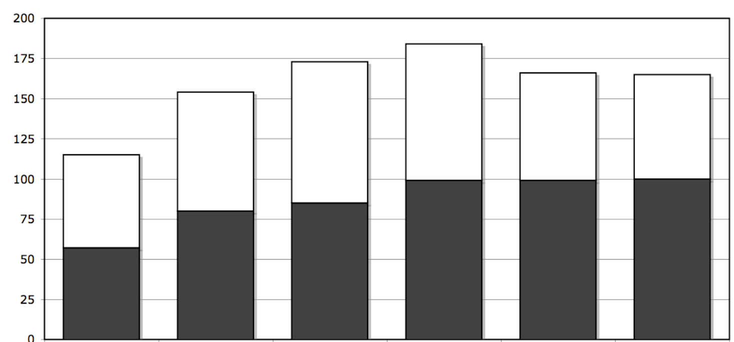
[7] Evans' PhD thesis (1985) contains more discussion of duration than Evans (1995a).

My own observations are that /ʈ/ is in fact only rarely a tap, and that /t/ may also be a tap on some occasions. A preliminary study of segment durations (Round 2002; in prep.), which controls for boundary-adjacent lengthening yielded the results shown in (2.4) for the durations of intervocalic plosives. Data comes from two narratives by the same, female speaker, and pertains only to tokens which are unaffected by lengthening at prosodic boundaries.[9] At this point, I have not assembled any data on variability.

(2.4)



	/t/	/ʈ/	/c/	/t̪/	/p/	/k/
Tokens	6	64	71	40	28	63
□ Preceding V	58	74	88	85	67	65
■ Plosive	57	80	85	99	99	100

Durations (ms) of intervocalic plosives (closure & release) and their preceding vowels

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[8] Quantitative data are not supplied, though spectrograms are provided showing intervocalic /t̪, t, ʈ/ (Evans 1985:498). Durations appear to be around 150, 50 and 25ms respectively. The plosive tokens occur in disyllabic citation forms. This places them near enough to breath group edges that boundary adjacent lengthening is expected.

[9] The only relevant boundaries appear to be the edges of breath groups.

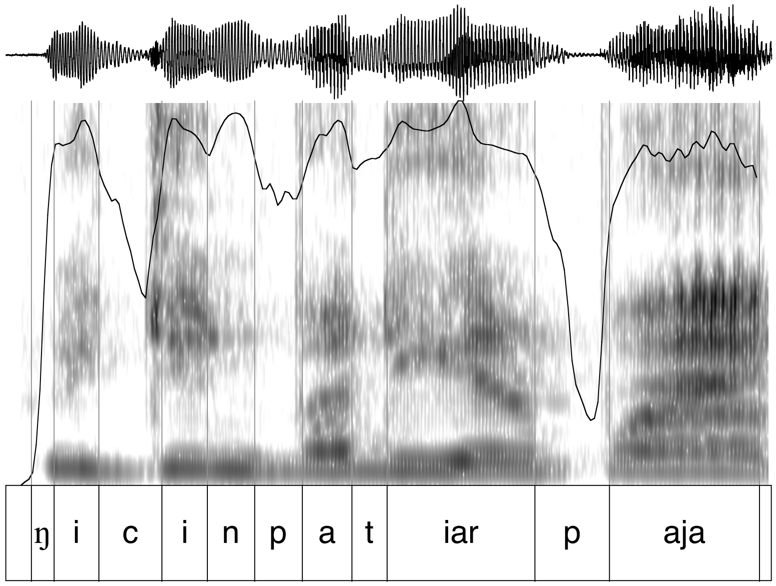
The status of /t/ is difficult to assess given the low number of tokens, but it is clear that /ʈ/ is not ‘extremely short’ in general, and that vowel durations do not vary in a strictly inverse manner with the duration of the following plosive.

2.1.2.3 Voicing

Evans (1995a:52) characterises plosives as ‘generally voiceless after sonorants and voiced elsewhere,’ with the exception that /t̪/ and /k/ ‘tend to a voiceless realisation in all positions’. This characterisation seems apt for careful speech, though I suspect that the ear attuned to the sound patterns of English may perceive plosives as ‘voiceless’ when they are followed by a noisy release, and ‘voiced’ otherwise even when the amount of phonetic voicing is equal. It may be that this, rather than true voicing is what contributes to the impression that /t̪/ and /k/ tend to be voiceless. Further instrumental study is required to resolve the issue. Voicing is also affected by speech style, speech rate and prosodic structure. To take one example, bilabial /p/ is often voiced at the beginning of a prosodic word, even after a sonorant.

The example in (2.5) illustrates several patterns just mentioned.

(2.5)



The word shown in (2.5) is *ngijinbadiyarrbaya* 'the one who carried me', uttered by a male speaker. A prosodic word boundary occurs between *ngijin-* and *-badiyarrbaya*. A spectrogram displays frequencies from 0–7000Hz, over which an intensity plot is superimposed. Both /c/ and the second token of /p/ in (2.5) appear to undergo passive devoicing — voicing is sustained after closure only while a sufficient transglottal pressure differential is maintained via passive expansion of the vocal tract (Stevens 2000:465–66); after a certain time the expansion ceases and voicing fails. Notice that intensity falls across the entire plosive. In both the earlier token of /p/ and in /t/, intensity falls barely if at all, perhaps indicating that voicing is being actively sustained (by any of several available strategies to maintain the transglottal pressure differential).

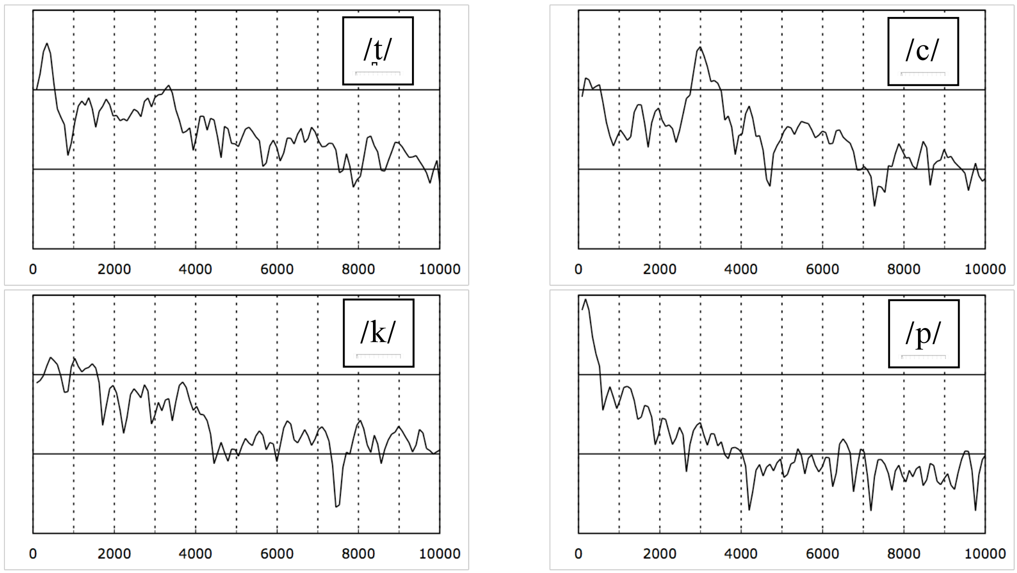
2.1.2.4 Releases

Plosive releases are regularly found in two environments, before a vowel and before a pause. The only plosive which can appear before a consonant is /c/, before /p/, in which position /c/ is typically unreleased.[10] For reasons of space, discussion here will focus on releases before vowels. We begin with fricated releases before moving to trilled releases.

Before vowels the apicals /t/ and /ʈ/ exhibit little if any frication in their release; /p/ typically has a relatively short, low-intensity release burst; release bursts for /t̪, c, k/ are longer. The distribution of spectral energy (0–10kHz) in the release bursts for /t̪, c, k, p/ preceding an /a/ vowel are shown in (2.6). Means have been taken across five tokens from the same, male speaker.

[10] The fact that /c/ in this position is both more advanced than a typical /c/ (§2.1.2.1) and unreleased makes it sound significantly more similar to /t/ than usual.

(2.6) Mean relative distribution of intensity in release burst spectra, 0–10kHz.
(mean taken across five normalised tokens of each plosive, all uttered by the same male speaker during casual speech; each plosive precedes /a/; the same logarithmic scale for intensity is used for each plosive type)



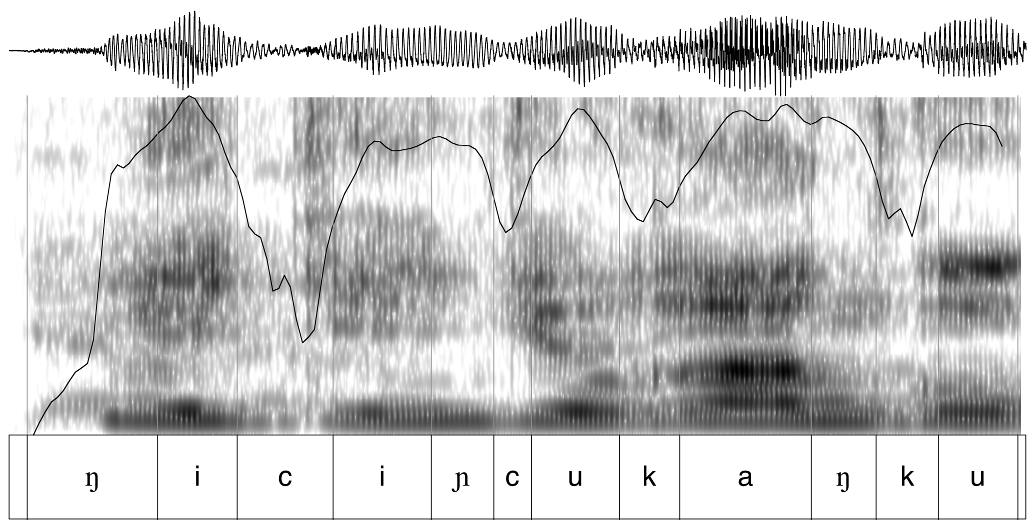
Relative to the other three plosives, little energy in the /p/ release is found high in the spectrum. Both /k/ and /t̪/ exhibit something of a plateau between 1 or 2 kHz and 3.5 kHz before energy levels drop away.[11] The positions of energy peaks for /t̪/ and /c/ occur in two frequency bands, one at low frequencies and one at ~2.5–3.5 kHz. The key difference is that for /t̪/ the first peak is greater (as is the low-frequency peak for /p/ and /k/), but for /c/ the peak centred at 3kHz is significantly more prominent. The concentration of energy at higher frequencies sets /c/ apart from all three other plosives.

It should be mentioned that intervocalically /c/ and /k/ often lack bursts *per se* and instead are realised as voiced or voiceless affricates, with a significant duration of

[11] This seems to corresponds to an occasional confusability between /t̪/ and /k/ which I have noticed when transcribing Kayardild audio recordings

frication before the vowel. An example is shown in (2.7), which contains two tokens of /c/ and two of /k/, one of each being intervocalic and one occurring after a homorganic nasal. In all four cases, the plosive is realised as an affricate, as can be seen in the high-frequency energy present before the vowel. The words in (2.7) are *ngijinju kangku* 'my words'. As in (2.5) above, the spectrogram displays frequencies from 0–7000Hz, and an intensity plot is superimposed.

(2.7)



This kind of affricated realisation is not found or at least is very rare for /t̪/ and /p/. In the case of /p/ a full closure often gives way to a relatively long offglide. (On the realisation of plosives without any full closure see further §2.1.2.5).

As mentioned above, the apical plosives /t/ and /ʈ/ tend to have negligible release bursts before vowels. However, tokens of /t/[12] which are preceded by a nasal or a liquid

[12] The apicals /t/ and /ʈ/ are neutralised post-consonantally and are represented in this dissertation as /t/.

may exhibit a trilled release.[13] The requirement that the plosive be preceded by a sonorant holds at the phonological, not phonetic level — as detailed in §2.1.4.2 below, both /ʈ/ and /ɻʈ/ are phonetically realised as retroflex plosives, but /ɻʈ/, which begins phonologically with a sonorant, can be followed by a trilled release. The trill of a release typically contains just one contact between the tongue apex and the alveolar ridge, but may contain more.

Phonetically, there is a contrast between (i) a nasal+plosive cluster followed by a trilled release, and (ii) a nasal+trill cluster which results from vowel elision (cf §2.1.6.2), as shown in (2.8). In the former the nasal is followed by a full closure occurs whose duration extends well beyond what is typical for the closure phase of a trill;[14] in the latter this is not the case.

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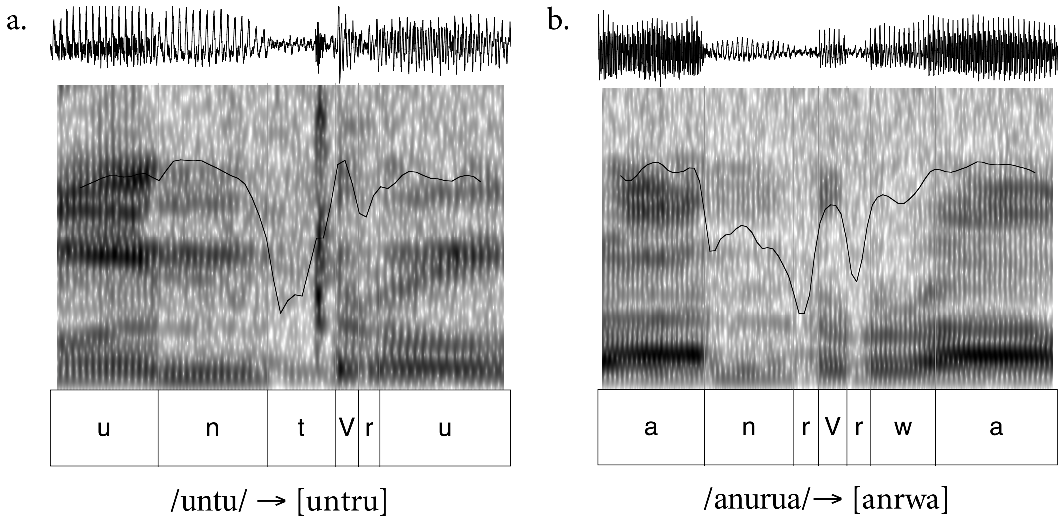
[13] Acoustically, the trilled release is quite conspicuous. It was noted explicitly anthropologist N. B. Tindale (1960:47), can be heard being emphasised in Wurm's Kayardild speech during elicitation sessions (Wurm 1960), and is described by Evans (1995a:55).

[14] This contrasts with the phonetic situation in Diyari (Central Australian). In Diyari, the sequences argued by Austin (1988) to be phonemically /n, l/ plus /d/ have closures for /d/ whose phonetic duration is short, corresponding to that of a trill (Trefry 1984:318–19).

(2.8) Difference between (a) [ntr] from /nt/ with trilled release, and (b) [nr] from /nur/ via vowel elision. In the former, a full stop closure (51ms) occurs after the nasal; in the latter the closures are part of the trill (both <30ms). Both tokens are uttered by the same, female speaker. Spectrograms show 0–7000Hz.



Trilled releases do not occur at the left edge of a prosodic word, even following sonorant+plosive clusters, thus for example the compound *marraldunbu* /maraltunpu/ 'deaf (lit. deaf-eared)', which contains a prosodic word break between /l/ and /t/, will not be pronounced *[maralt^{r}unpu].

Elsewhere in Australia, trilled releases of apical plosives are found in several languages of the Lake Eyre region of central Australia and in Cape York in the far north-east (Austin 1988; Evans 1995b:736). Across the Central Australian languages, the most common phonotactic environment for trill-released apicals is in cluster, following [n] or [l] (Austin 1988), and in Anguthimri (Cape York) such plosives, although not synchronically preceded by a sonorant, descend historically from erstwhile sonorant+plosive clusters (Crowley 1981:157–8).

2.1.2.5 Lenited realisations without full closure

In casual speech and even in some careful speech, plosives can be articulated without any full closure. Impressionistically, this seems to be most common for /k/ and /c/, followed by /p/ and then /ʈ/. Neither /t/ nor /t̪/ are often lenited in this way. The more posterior plosives /k/ and /c/ are realised as voiced or voiceless fricatives, or in the case of /c/, as a semivowel. Presumably the semivowel realisation of /c/ is a laminal pre-palatal approximant and thus articulatorily distinct from dorsal palatal /j/; the two sound very similar though.[15] The labial /p/ lenites to an approximant. Evans (1995a:54) transcribes this as [w], though my impression is that the articulation is usually labial only, rather than labiovelar. Retroflex /ʈ/ lenites to a retroflex approximant /ɻ/ with relatively little apical retraction.

2.1.3 Phonetic characteristics of nasals

This section addresses place of articulation in §2.1.3.1, and the lenition of utterance initial nasals in §2.1.3.2.

2.1.3.1 Place of articulation and a note on /n̪/

The oral tract closures for nasals are articulated in the same manner as plosives. Since the nasals lack the voicing contrasts and releases characteristics of plosives however, the

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[15] I am unsure whether native speakers would be able to distinguish the two perceptually. I am not able to; Evans (1995a:226,62,465) describes /c/ leniting to [j] under certain circumstances without any comment that it might differ from /j/.

acoustic cues distinguishing them are quite different. Particularly close in perceptual terms are intervocalic /n/ and /n̪/. The latter appears in derived environments (from underlying /t̪+ɲ/) in the apprehensive inflection of verbs, and sometimes via post-lexical simplification of /n̪t̪/ → /n̪/ and reportedly in just two other places: in the roots *kanhithu-* /kan̪it̪u/ 'whale' and *jalnganhang-* /calŋan̪aŋ/ 'tongue' (Evans 1992; 1995a), however I have not been able to confirm that these two roots do indeed contain /n̪/. While there is no compelling reason to doubt the status of these nasals as /n̪/, some relevant facts can be listed as follows.

On the grounds of comparative and internal evidence, a number of /n/ segments in Kayardild can be reconstructed as having descended from */n̪/, such as the nasal in *minal-* /minal/ 'bushfire', cf Yukulta and Lardil /min̪al-/ 'burnt country'. The historical change */n̪/ > /n/ appears to have affected all non-derived intervocalic /n̪/ segments bar those in 'whale' and 'tongue'.

Hale transcribes 'whale' and 'tongue' with /n/ rather than /n̪/, as /kanit̪u-/ (Hale 1960a) as /calŋanaŋ-/ (Hale 1960b).

Evans occasionally writes 'whale' as *kanithu* /kanit̪u-/ (1995a:245,699,745,68), and also for 'bark torch' alternates between *manharr-* (1995a:93,94,379,474,578,762) and *manarr-* (1995a:94,404,580,722,724,725,763,771).

In this dissertation, I will follow Evans' (1992; 1995a) dictionary entries, and assume the forms to be /kan̪it̪u/ 'whale' and /calŋan̪aŋ/ 'tongue' with /n̪/, and /manar/ 'torch' with /n/.

2.1.3.2 Lenition of utterance initial nasals

Utterance initial nasals, in particular /ŋ/, are often lenited in two ways. Firstly, a full oral closure is not made. Secondly, modal voicing is delayed for some or all of the segment, and phonation is breathy instead. The result is a breathy or voiceless, nasalised approximant such as [ɰ̤̃] or [ɰ̤̃͡ŋ] for /ŋ/.[16] An example can be seen in (2.7) above. In the first half of the initial /ŋ/ (realised as [ɰ̤̃͡ŋ]) modal voicing is absent and a nasal zero can be seen rising from ~1000Hz to ~1300Hz, which is consistent with expectations for a nasal vowel (or semivowel) that precedes a nasal stop (Stevens 2000:303–22). The two visible formants in the first (lenited) half of /ŋ/ are also on par with what one would expect for a high back vowel (compare their height with the height of the formants in the final vowel, /u/), though F1 is lowered and rises with the nasal zero, again as expected for a nasalised (semi-)vowel.

2.1.4 Phonetic characteristics of liquids

The place of articulation of a liquid segment is traditionally described with reference to articulations made with the apex and blade of the tongue — for the present discussion, let us call these **anterior constrictions**. At the same time there has been instrumental confirmation for some decades now that liquids such as the 'dark l' of English involve a dorsal (or **posterior**) constriction also (Giles & Moll 1975). This section discusses the phonetic characteristics of liquids in Kayardild. The hypothesis is advanced, that the articulation of liquids in Kayardild is generally complex, comprising both an anterior

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[16] The perceptual effect can be reminiscent of English /h/.

(apical) and a posterior (dorsal) component.[17] This follows recent research such as Gick et al. (2006), which found that across six languages, laterals and trill/taps all involved both anterior and posterior articulations in at least some contexts.

2.1.4.1 The lateral

Kayardild has just one contrastive lateral, /l/. The Kayardild lateral is a ‘clear l’ sound. Clear laterals have been found in other languages to involve either no noticeable posterior articulation, or a dorsal, posterior articulation which is non-back (Recasens & Espinosa 2005; Gick et al. 2006). In §2.1.6.2 some reasons are given for assuming that a non-back dorsal articulation is present, at least in contexts where /l/ does not immediately follow a stressed vowel.

The anterior constriction of /l/ is apical alveolar, except when it is followed by a laminal consonant, to which it will assimilate (Evans 1995a:55–56).

A distinctive aspect of the articulation of /l/ not observed previously is its occasional pre-stopping in intervocalic contexts. Two examples of pre-stopped laterals in Kayardild are shown in (2.9). In both cases, the lateral follows stressed /a/.

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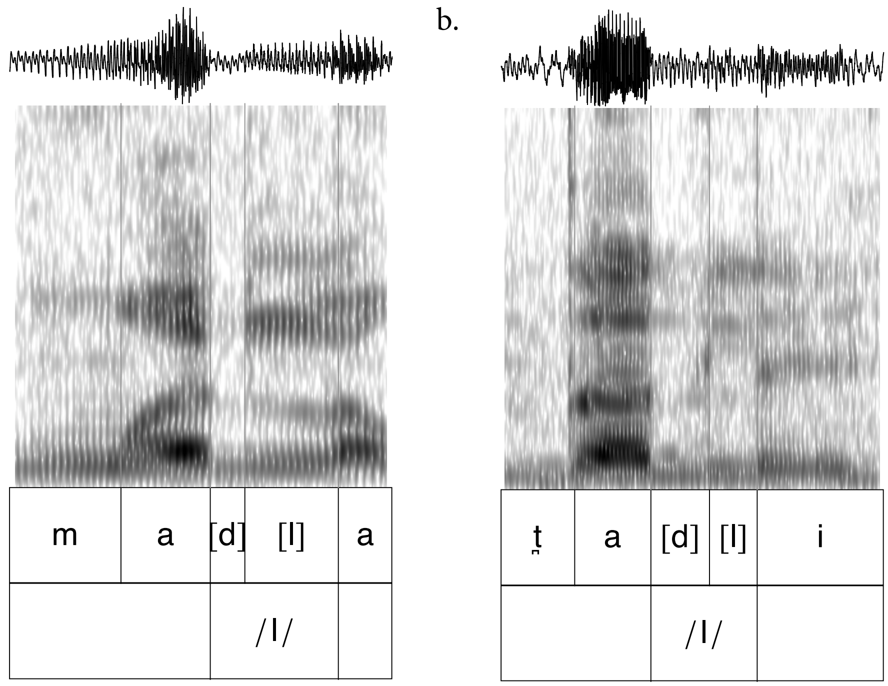
[17] I am particularly grateful to Michael Proctor, and to Louis Goldstein for an ongoing discussion on this topic.

(2.9) Pre-stopped laterals in (a) *malamaruth* ‘put in the water’ and (b) *thali* ‘laden’, uttered by two different female speakers. Spectrograms show 0–7000Hz.

a. b.



Phonetic, and sometimes phonologically contrastive, pre-stopped laterals have been reported in several language families in Australia (Hercus 1972; Evans 1995b:734–35; Loakes et al. 2008). Both Hercus (1972) and Loakes et al. (2008) describe pre-stopping as being more likely in some contexts than in others (in particular, it is most common after a stressed, high vowel). At this point, I do not have any comparable contextual data for Kayardild.

2.1.4.2 The retroflex approximant

Of all segments in Kayardild, /ɻ/ is the one with the greatest range of perceptually salient, acoustic variation, though the acoustic variation results from variations in articulation which are no more pronounced than those of plosives described above. It is hypothesised here that /ɻ/ is typically articulated with a non-back posterior constriction and a raising and retraction of the apex of the tongue behind the alveolar ridge, with no contact being made between the tongue and the roof of the mouth. An example of /ɻ/ with this typical articulation is shown in (2.10a) below. As expected, an extra resonance corresponding to the sublingual cavity is present between the normal second and third formants (compare (2.10a) with (2.10c)), and the higher formants are progressively depressed in the transition from vowel to approximant.

There are two primary deviations from the typical realisation. The first involves a 'lenited' anterior constriction, and the second a flapped articulation.

As mentioned previously for other retroflexes, the degree of apical retraction may vary, in particular it can be reduced. At the most extreme, this 'lenition' of the anterior constriction translates into the tongue apex being raised only slightly and barely retracted at all; the posterior constriction is possibly lenited too. An example uttered by a female speaker is shown in (2.10c). It can be noted that the first two formants of /ɻ/ in (2.10c) occur at ~400Hz (for F_1) and ~1850Hz (for F_2), corresponding to something like [ɨ].[18] Presumably this reflects the dominant effect of the posterior constriction on the overall acoustic properties of this kind of realisation of /ɻ/. Indeed, to the English speaker's ear, the acoustic effect is not unlike a weakly articulated like [j], though with trained listening

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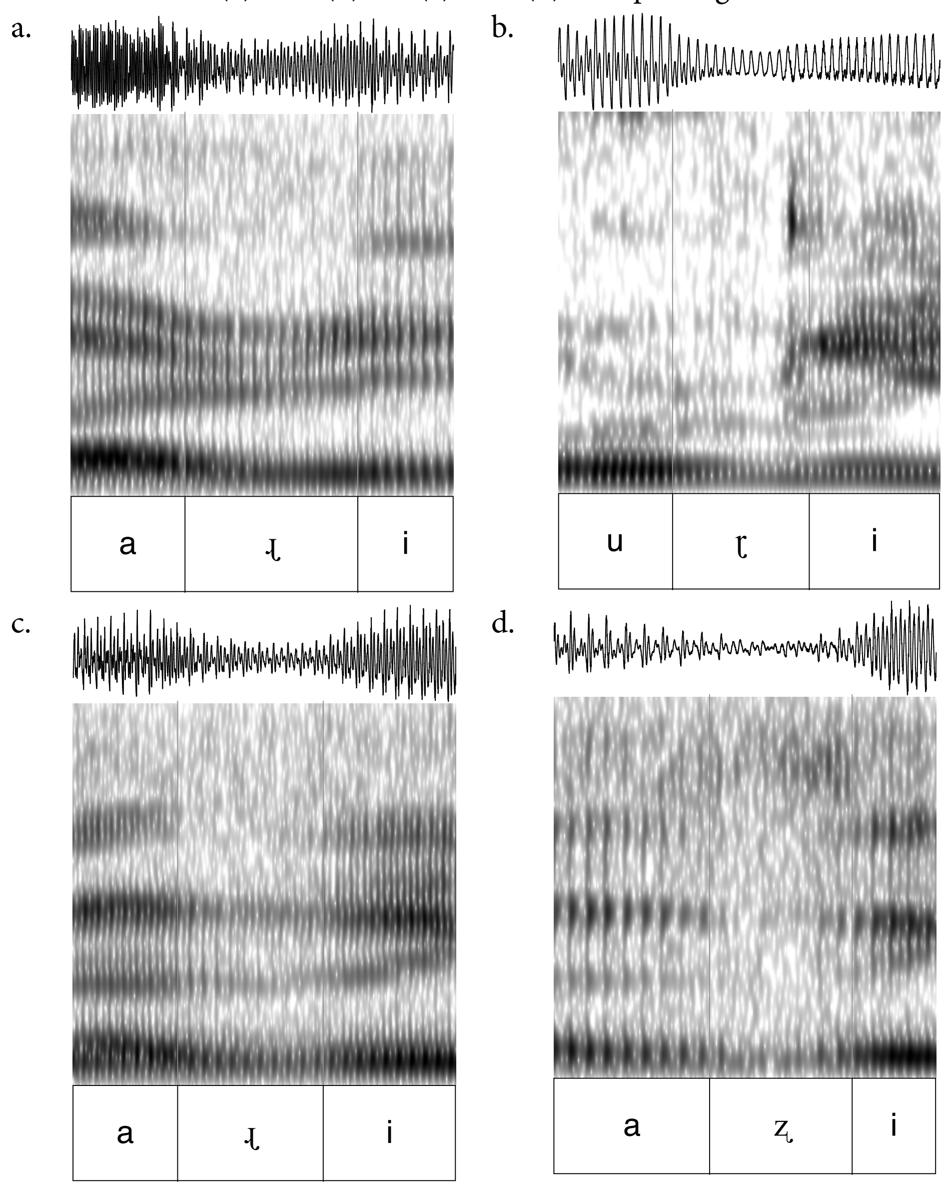
[18] Based on a comparison with formant values reported by Fletcher and Butcher (2003) for a female Kayardild speaker (where F_1;F_2 were on the order of ~450;2000Hz of /i/ and ~450;1100Hz for /u/).

a difference can be perceived.[19] Evans (1992; 1995a) records an alternation in several words as between initial /ɻ/ and /j/; this almost certainly reflects normal variation in the production of initial /ɻ/ rather than an alternation between contrastive /ɻ/ and /j/. On occasion the apical constriction becomes narrow enough to induce frication, resulting in a weakly-retroflexed [z̢], a sound transcribed by anthropologist Normal B. Tindale (1960; 1962; 1963) as <rθ>, for example in <ˈra:rθ> for /ɻaɻ/ 'south' (Tindale 1962:261). An example of a fricated /ɻ/ is shown in (2.10d).

[19] It also resembles the articulation of /i/ made by some Swedish speakers in which the tongue tip is raised (mentioned e.g. by Engwall 2003:317).

(2.10) Four phonetic realisations of /ɻ/ :

(a) The 'typical' retroflex approximant: note the presence of an extra resonance in the preceding /a/ vowel of (a) compared to (c), and the lowering of higher formants going into /ɻ/. (b) The retroflex flap: a short, voiced closure and a burst occur at the end of [ɽ] and the extra resonance is present in the preceding vowel. (c) Approximant with barely-retracted tongue tip: note the absence of the extra resonance. (d) The fricated equivalent of (c): high frequency noise is particularly visible towards the end of [ʐ]. Time scales are not identical; durations (ms) of the consonants are: (a) 137; (b) 76; (c) 114; (d) 86. Spectrograms show 0–7000Hz.



The other main acoustic variant of /ɻ/ results when the tongue apex is raised higher than usual when returning from its back-most position, thus coming into contact with the edge of the alveolar ridge to form a retroflex flap, as illustrated in (2.10d). The frequency with which flapped articulations occur appears to have varied between speakers; for some it was common (Evans 1995a:56–57), some rare, and some speakers appear never to produce it.

Evans (1995a:57) reports one speaker realising /ɻ/ as [ɭ] (in other Tangkic languages, the cognate segment of Kayardild /ɻ/ is realised as [ɭ] in at least some contexts), and the same is implied by some of Tindale's (1960; 1962; 1963) spellings of Kayardild words with <l> corresponding to otherwise attested /ɻ/.

The phonological segment /ɻ/ may form a cluster with /t/,[20] which then contrasts with the simple plosive /ʈ/. The analysis of /ɻt/ into /ɻ/+/t/ justified by morphophonological alternations. On the other hand, it is not clear whether a cluster /ɻn/ contrasts with /ɳ/. Such clusters are expected on morphophonological grounds, yet the few examples I have do not detectably differ in acoustic terms from /ɳ/. Given the nature of the confirmed contrast between /ɻt/ and /ʈ/ though (more on which below), the non-distinctness of a handful of putative /ɻn/ clusters is not particularly informative. It may be that the true range of realisations of /ɻn/ and of /ɳ/ are significantly overlapped, but nevertheless are distinct as would be revealed by the comparison of a large set of tokens.

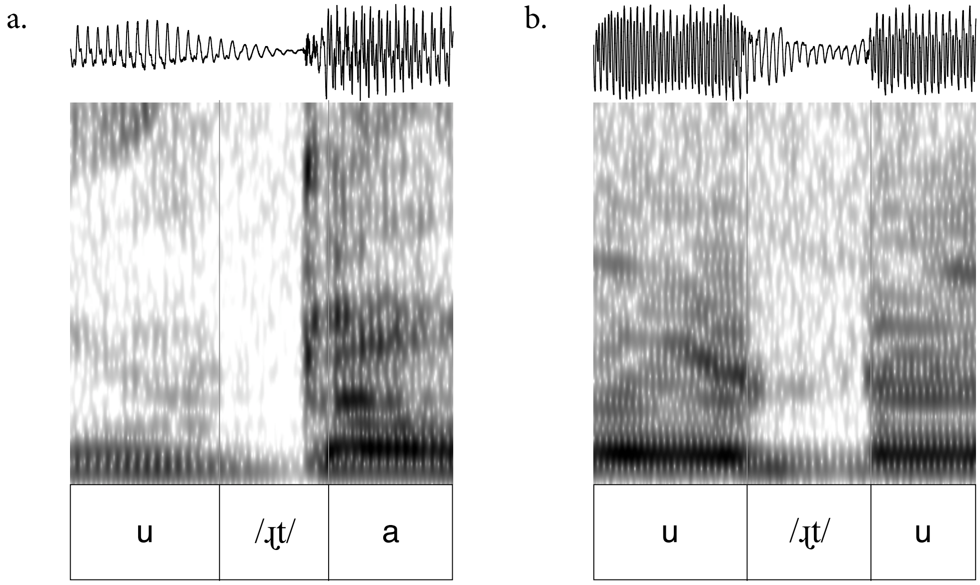
A phonetic contrast between /ɻt/ and /ʈ/ exists, but the range of realisations of /ɻt/ and /ʈ/ is heavily overlapped, so that many individual tokens could equally represent one

[20] The cluster /ɻt/ is written *rld* in Kayardild orthography.

category or the other. Evans (1995a) does not comment on the phonetic overlap, but identifies several differences between /ɻʈ/ and /ʈ/: (i) a longer period of vowel colouration before /ɻʈ/ than before /ʈ/; (ii) a shorter vowel before /ɻʈ/ than before /ʈ/; (iii) the possibility of a trilled release after /ɻʈ/ (cf §2.1.2.4) but not after /ʈ/; and (iv) voicelessness of the plosive in /ɻʈ/ is while /ʈ/ is voiced. My own observations are slightly different, though they follow along the same lines. Phonetically, both /ɻʈ/ and /ʈ/ are retroflex plosives; in any given context (taking into account speech rate, intended clarity, prosodic position and so forth) the degree of apical retraction of /ɻʈ/ will tend to be greater than that of /ʈ/,[21] and hence so too will be the degree of vowel colouration; /ɻʈ/ but not /ʈ/ may be followed by a trilled release; and /ɻʈ/, being realised by a more pronounced articulatory movement which presumably takes longer to execute, is more likely than /ʈ/ to undergo complete passive devoicing. Notwithstanding the last generalisation, many tokens of /ɻʈ/ are in fact fully voiced. Devoiced and voiced tokens of /ɻʈ/ are shown in (2.11).

[21] To be clear, the claim here is that Kayardild appears to exhibit a phonetic contrast between two different degrees of retroflexion. At the phonologically level though, the contrast is between the single segment /ʈ/ and the cluster /ɻʈ/.

(2.11) Realisations of /ɻʈ/ in which voicing ceases (a), in *burldamurra* ‘several’ uttered by a male speaker; and does not (b), in *mirburldunbu* ‘blind’ uttered by a female speaker. Spectrograms show 0–7000Hz.



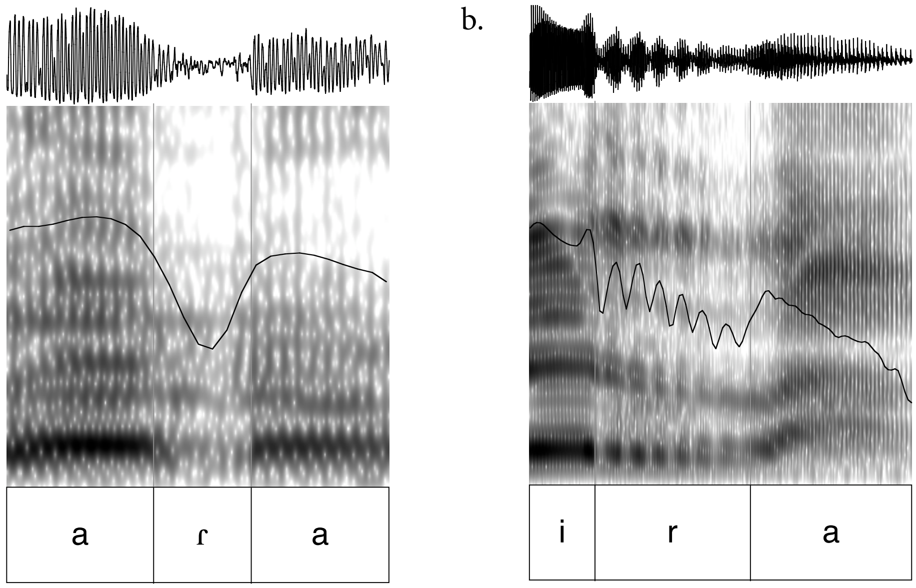
In §2.1.2.3 it was mentioned that /p/ may be more likely to be voiced following a sonorant if it occurs at the start of prosodic word. This may also be true of /ɻʈ/ in which /ʈ/ occurs phonologically at the start of a prosodic word, as occurs in (2.11b), where the word is *miburldunbu* /mipuɻʈunpu/ ‘blind’ ← /mipuɻ/ ‘eye’ + /ʈunpu/ ‘deaf’, with a prosodic word break between /ɻ/ and /ʈ/. The token in (2.11b) was uttered clearly, as a citation form.

2.1.4.3 The trill

The trill /r/ may be realised as a single tap (2.12a) or as a true trill with multiple closures (2.12b). True trills are especially common in emphatic speech, and Evans (1995a:56) suggests that women may use trills more than men. The number of closures in a trill has no obvious any upper limit: the token in (2.12b) for example contains seven closures.

(2.12) Realisations of /r/ in with (a) one closure, and (b) seven. Tokens are uttered by different, female speakers. Time scales are not identical; durations (ms) of tokens of /r/ shown are: (a) 36; (b) 250. Spectrograms show 0–7000Hz.

a. b.



In casual speech it is not uncommon for complete closure to be absent; the tongue apex raises, but does not form any closure. An /r/ of this type appears in (2.5) above in the context /ia__p/ — note the lack of any closure before /p/ that would correspond to a true trill or tap. The sound (and presumably articulation) of this 'lenited' /r/ is similar if not identical to the lenited /ɻ/ described above in which the tongue apex is raised only slightly.

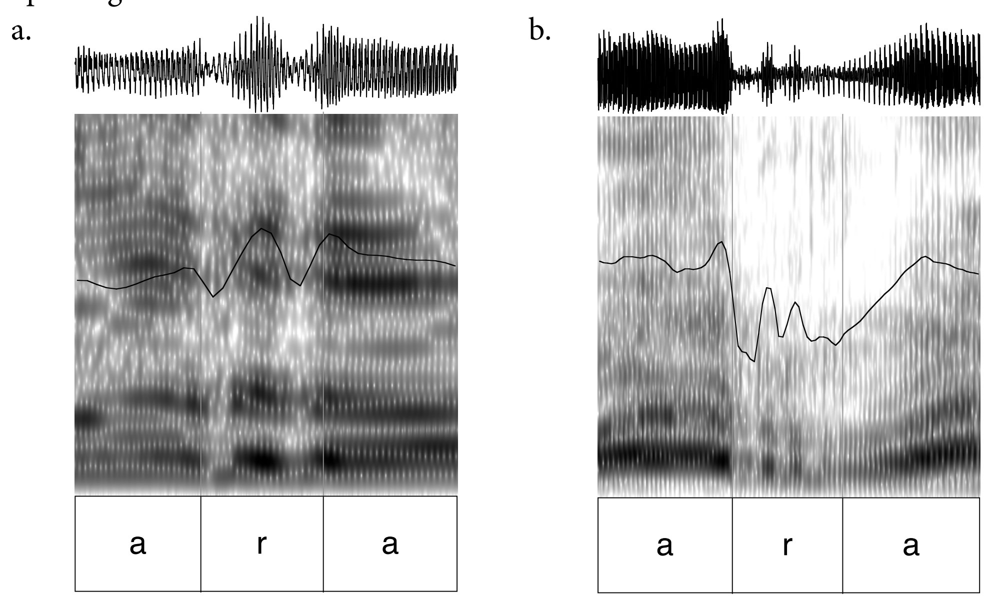
It is hypothesised here that like other Kayardild liquids, /r/ involves a posterior, dorsal constriction. As was the case for /l/ there is evidence to suggest that the dorsal constriction is non-back, at least in contexts where /r/ does not immediately follow a stressed vowel. Three observations can be made here, as follows.

Immediately before a pause, an utterance which ends phonologically in a consonant may conclude with a breathy or devoiced, excrescent vowel. Particularly after

/r/, that vowel has a noticeable /ɪ/-like quality. This has been noted by Evans (1995a:55), and an <i> appears in several of Tindale's transcriptions of /r/-final citation forms, e.g. <ˈBirpaˈkari> (Tindale 1962:Map A) for the place name *Birrbakarr* /pirpakar/.

In trilled tokens of /r/ which follow an unstressed vowel, the formant structure of micro-vowels between closures is close to [e]. An example is shown in (2.13a) where F_1;F_2 are ~550;1850Hz. (A trill following a stressed vowel is shown in (2.13b) where F1;F2 are ~500;1100Hz, which more closely matches [o].)

(2.13) Realisations of /r/ in the context /a_a/, (a) after an unstressed vowel, and (b) after an unstressed vowel Tokens are uttered by different, female speakers. Time scales are not identical; durations (ms) of tokens of /r/ shown are: (a) 68; (b) 144. Spectrograms show 0–7000Hz.



2.1.4.4 Coarticulation of liquids and /w/

Phonological sequences of liquid+/w/ are often realised phonetically as liquid with secondary labialisation, i.e., /lw/ → [lʷ]; /ɻw/ → [ɻʷ]; /rw/ → [rʷ]. Impressionistically, the labial closure might be timed slightly later than articulation of the liquid *per se*. It can overlap with the following, but not with the preceding vowel. If the vowel following the labialised liquid is /u/, the acoustic cues to /w/ can be very weak.[22]

2.1.4.5 Coarticulation of liquids and dorsal velars

I suspect that there is a degree of coarticulation between liquids and the velar consonants /k/ and /ŋ/, which are slightly fronted by the liquid. Presumably this involves an interaction between the non-back, dorsal component of the liquid and the dorsal component of /k, ŋ/. Further instrumental study is needed to confirm this.

2.1.5 Liquids and retroflexes as a phonetically natural class

If the hypothesis regarding the posterior articulation of liquids is correct, then liquids and retroflexes in Kayardild form a phonetically natural class — that is, they and only they are articulated with a co-ordinated anterior and posterior lingual constriction. For the remainder of the chapter, I will characterise these segments phonologically as having two places of articulation: they are [+Apical] and [+Dorsal]. In §2.3, this combination of

[22] See also §2.4.2 regarding transcriptions of certain liquid+/w/+/u/ strings in Evans (1995a).

features is used to advantage in stating generalisations over the phonotactics of Kayardild consonant clusters.

2.1.6 Phonetic characteristics of vowels and semivowels

This section surveys the phonetics of Kayardild vowels and semivowels. Vowel quality is discussed in §2.1.6.1, vowel shortening and elision in §2.1.6.2 and semivowel quality and elision in §2.1.6.5. See also §2.2.2 regarding assumptions in this dissertation relating to vowel hiatus which differ from the analysis of Evans (1995a).

2.1.6.1 Vowel quality

Kayardild has a triangular vowel system with a contrastive distinction in length. The high back vowel /u/ is rounded with a vertical compression of the lips, but little forward lip protrusion. Although the IPA symbols /i a u/ are used throughout this dissertation, if one compares the actual phonetic qualities of Kayardild vowels, for instance to American English vowels (based on measurements in Fletcher & Butcher 2003; Peterson & Barney 1952), the transcriptions [ɪ ɐ ʊ] would be more apt.

Fletcher and Butcher (2003) examine the formant structure of Kayardild vowels with the aim of investigating their peripherality or centrality within the vowel space. Vowels of two speakers were examined, in relation to two independent variables: contrastive length; and ‘prosodic context’, the second of which pertains to the distinctions between phrase final versus non-final, and accented versus unaccented vowels. Little in the way of significant results were found consistently across both speakers, but two patterns emerged clearly: (i) that short low vowels were more central than long low vowels, and (ii) that unaccented low vowels were more central than accented low vowels. Tendencies toward similar patterns in the high vowels — i.e., greater centrality for short and for unaccented vowels — are apparent in the data but are not particularly strong or consistent.

Evans (1995a:58–61) provides fine-grained transcriptions of vowels and vowel/semivowel sequences for Kayardild. Looking first at the correlation between quality and prosodic prominence, Evans' descriptions accord well with the findings of Fletcher and Butcher, if one equates Evans' 'stressed' with Fletcher and Butcher's 'accented' vowels — that is, stressed/accented vowels tend to be more peripheral, and unstressed/unaccented more central. On the other hand, Evans reports that for high vowels, /uː/ and /iː/ are lower than /u/ and /i/, and that for low vowels /aː/ and /a/ have similar qualities — contrary to Fletcher and Butcher's findings on both counts. In the absence of further instrumental data, I will not attempt any narrow characterisation of vowel quality here. Future instrumental studies will benefit from controlling for factors such as the presence/absence of a following [+Apical +Dorsal] consonant (see §2.1.6.2 immediately below) as well as differentiating between the effects of stress (a lexical property) and accent (post-lexical).

2.1.6.2 Centralisation of high vowels and before [+Apical, +Dorsal] consonants

In §2.1.4.3 we saw evidence from the formant structure of micro-vowels to suggest that the articulation of the trill /r/ involves a dorsal component comparable to [e] (after unstressed vowels) and [o] (after stressed vowels). Evans (1995a:58–59) describes the high vowels /i/ and /u/ as being lowered before a following /r/, and presumably this reflects a coarticulation between the vowel itself and the dorsal component of the following trill.

Evans' account of vowel allophony includes a similar lowering of /i/ and /u/ to [eʴ], [oʴ] before retroflexes, though in Evans' prose description of the process this is described as centralisation rather then lowering (1995a:58).

In addition to these effects, which I suspect are posited on the basis of observations of stressed vowels,[23] high *unstressed* vowels will tend to centralise, often markedly, along the front–back dimension if the vowel is followed by a [+Apical, +Dorsal] consonant, i.e., by a liquid or a retroflex.[24,25] Again, centralisation is probably due to coarticulation between the vowel and the dorsal component of the following consonant. It is known that in the articulation of liquids, prosodic position can correlate with the both the geometry and the timing of the posterior constriction (Sproat & Fujimura 1993; Browman & Goldstein 1995; Gick et al. 2006), and in Kayardild it may be that after an unstressed vowel, the posterior constriction is timed relatively early, thus impinging noticeably on the preceding vowel. Further research is needed, but it is plausible on the

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[23] The examples cited by Evans to illustrate vowel allophony all contain stressed vowels.

[24] Centralisation to the same degree is not shared by unstressed high vowels in other environments.

[25] These phonetic effects can account for some differences in the representation of certain Kayardild forms here, compared with Evans (1995a). The combination of fINST /ŋuni/ + fPROP /kuː/ is reported in Evans (1995a:153) to be realised as /ŋunu/, but my own interpretation is that the surface string corresponds to /ŋuniuu/, with phonetic variation between [ŋʊnəʊ] and [ŋʊnʊ] as expected. Likewise, a reported instance of fLOC+fALL /ki+ i / → /ku u / in the context of /u/ vowels in both neighbouring syllables (Evans 1995a:78,ex.2-19) appears to be transcribed from one of Wurm's (1960) recordings, in which I hear vowels corresponding to /i/; although the vowels in question exhibit a noticeable degree of co-articulation, to my ear they are distinct from /u/.

basis of existing evidence to propose that the posterior articulation of all [+Apical, +Dorsal] consonants after an unstressed vowel in Kayardild is approximately comparable to a lax [ɨ], and therefore induces centralisation of both /u/ and /i/.[26]

2.1.6.3 Long vowel shortening

Particularly in casual speech, distinctive vowel length in unstressed syllables can be neutralised phonetically, so that long vowels sound no longer than short vowels.

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[26] Hamann (2003:44ff) has argued that retroflex consonants cannot be articulated with a non-back posterior constriction, a claim which may be problematic for the proposal above. In its defence though, Hamann herself identifies several reported cases of 'palatalised' retroflexes (Hamann 2003:47-50), and in the Australian context there is additional, diachronic evidence which can be brought to bear on the issue. Firstly, consider the diachronic facts of posterior consonantal constrictions in general: these may change over time into more independent, vowel-like units. For example, 'dark l' becomes [u/w] in some varieties of English (Hardcastle & Barry 1989), rhotics becomes [ə] and [ɐ] in varieties of English and of German (Wiese 1996), and 'clear l' has become [i/j] in the history of Italian (these changes involve a loss from the erstwhile liquid of its anterior constriction). In the Australian context, Koch (1997) reconstructs a change in which retroflexes have become pre-*palatalised* apicals. Such a change can be seen as phonetically natural if the original retroflexes had a non-back posterior constriction — specifically, the change would involve the timing of the posterior constriction shifting to a point so early relative to the anterior constriction that overlap between the two became negligible, while the retraction of the tongue apex was lost (cf the description of 'lenited' retroflexes in Kayardild, in §2.1.2.1 and §2.1.4.2 above). Breen (2007) also discusses data pertaining to retroflexes and pre-palatalised apicals in a number of languages of the same area, pointing out synchronic interactions between the consonants and (i) the backness of the preceding vowel, and (ii) the laminal articulation of consonants in preceding onsets.

2.1.6.4 Vowel shortening and elision before continuants

In general, vowels in Kayardild are susceptible to phonetic shortening and sometimes elision before continuants, i.e., before liquids, semivowels and other vowels. Somewhat surprising from a cross-linguistic perspective[27] is the observation that even stressed vowels are subject to this process. For example, according to the lexical stress system of Kayardild, the associative suffix /-ɳuru/ is stressed on its first syllable (on suffix stress see Ch.5 §5.3.5), yet in casual speech the suffix regularly reduces acoustically[28] to [-ɳru] as illustrated in example (2.8b) above. Likewise, a large numbers of tetrasyllabic words in Kayardild end in /ua/ and /ia/. The high vowel (the nucleus of the penultimate syllable) typically carries lexical stress, yet it is regularly very short (one hears /wa/ and /ja/) or even absent.

It is likely that the post-lexical shortening and elision of vowels is at least partially rule-governed — for example, high vowels tend to shorten and elide sooner than neighbouring low vowels do; and in a sequence $V_1(C_1)V_2(C_2)V_3$ in which C_1 and C_2 are continuants and where V_1, V_2 and V_3 are all high vowels, V_2 tends to elide first. An

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[27] It is possible, though, that this specific phonetic pattern is rather wide-spread in Australia. Dixon (2002:654) documents over a dozen languages from distinct geographical regions in which word initial $*C_1VC_2$ sequences have become C_1C_2, but only if C_2 is a continuant.

[28] In articulatory terms, it may be that /u/ is still present (i.e., the corresponding dorsal constriction is formed), only that its presence is entirely obscured by the overlapping articulations of the nasal and trill, a phenomenon termed 'hiding' by Browman and Goldstein (1995).

awareness of these existence of these processes proves to be indispensible in the accurate identification of stress in Kayardild — as discussed further in Ch.5 §5.2.1.

2.1.6.5 Semivowel quality and elision

In clear speech, the semivowels /j/ and /w/ are dorsal palatal and labialised dorsal velar approximants respectively, however their realisation is highly sensitive to segmental context, prosodic position and to speech rate and style. Both semivowels can reduce to schwa-like approximants (though /w/ may retain some weak labialisation), and in some instances the percept of the semivowel is lost entirely. For example, /aja/ and /awa/ are often realised as [aᵊa] and even [aː] in casual speech.[29]

In utterance initial position, palatal /j/ may go unrealised before /i/ and /a/, as may /w/ before /u/. An inverse pattern is observable in the borrowing of vowel- and /h/-initial words into Kayardild from English, with /j/ inserted before /i/ or /a/ and /w/ before /u/, as in *yaligida* /jalikita/ "aligator (i.e., crocodile)"; *yama* /jama/ 'hammer'; *yingkiliji* /jiŋkilici/ 'English'; and *wuku* /wuku/ 'hook'.

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[29] This also results in neutralisation for example of /aju/ and /awu/, both as [au]. Evans (1995a:216) states that the final /t̪/ in /pat̪/ 'west' irregularly deletes before suffixes beginning with /w/. However, if we consider that /t̪+w/ → /j/, then an inflection of /pat̪/ 'west' e.g. /pat̪+wulat̪a/ → /pajulat̪a/ would often surface as [paulat̪a]. That surface form has evidently then been phonemicised by Evans as /pawulat̪a/.

2.1.7 Minimal pairs

This section presents minimal and near minimal pairs and tuples providing a basic illustration of segmental contrasts. For segment distributions and positional neutralisations of contrasts, see §2.3. In the sets below, verbs appear in the actual tense[30] and nominals are uninflected (i.e., both are given in their citation forms) unless otherwise indicated. To begin, the six plosives are contrasted in (2.14).

(2.14) Contrasts between the six plosives

/p/:	/t̪/	puːca – t̪uːca 'pull' – 'swear'	/t/	watua – wapua 'smoke' – 'harpoon'	/ʈ/	pijaca – ʈijaca 'paddle' – 'eat'
	/c/	paːca – caːca 'bite' – 'enter'	/k/	paːca – kaːca 'bite' – 'shelter'		
/t̪/:	/t/	kalat̪a – kalata 'cut' – 'cut.DES'	/ʈ/	ɳat̪aa – ɳaʈaa 'camp' – 'reed sp.'	/c/	kalat̪a – kalaca 'cut' – 'fly'
	/k/	t̪uːca – kuːca 'swear' – 'bathe'				
/t/:	/ʈ/	patina – paʈinaa 'carry.NEG.IMP' – 'whisker.ABL'	/c/	kalata – kalaca 'cut.DES' – 'fly'	/k/	pita – pika 'smell' – 'flank'
/ʈ/:	/c/	kuʈaa – kucaa 'coolamon' – 'pubic hair'	/k/	ʈalica – kalica 'come' – 'jump'		
/c/:	/k/	caːca – kaːca 'enter' – 'shelter'				

Five of the nasals are contrasted in (2.15). The sixth nasal, /n̪/, occurs infrequently (cf §2.1.3.1) so even near-minimal pairs involving it are few. It is contrasted with /n, ɲ, m/ in (2.16).

[30] Technically speaking, the inflection is for the 'actual' value of the 'thematic tense/aspect/mood' feature (on inflectional features, cf. Ch.6 §6.1.1).

(2.15) Contrasts between the nasals other than /n̪/

/m/:	/n/	ʈamanta – ʈananta ‘tooth’ – ‘leave.N’	/ɳ/	maːca – ɳaːca ‘twitch’ – ‘burn’
	/ɲ/	muɻaː – ɲuɻaː ‘round’ – ‘cartilage’	/ŋ/	mutica – ŋutica ‘tie up’ – ‘throw’
/n/:	/ɳ/	ŋawunurua – ŋawuɳurua ‘ash.ASSOC’ – ‘dog.ASSOC’	/ɲ/	kunawalata – kuɲawalata ‘children’ – ‘small.PL’
	/ŋ/	manara – maŋara ‘torch’ – ‘temple’		
/ɳ/:	/ɲ/	ɳaɻaː – ɲaɻaː ‘nectar’ – ‘gecko’	/ŋ/	ɳita – ŋita ‘name’ – ‘wood’
/ɲ/:	/ŋ/	ɲuɲuka – ŋuŋuka ‘lie’ – ‘story’		

(2.16) Contrasts with /n̪/

/n̪/:	/n/	kuːcuːn̪a[31] – kuːcuːna ‘bathe.POT.COMP’ – ‘swim.NEG.POT’	/ɲ/	kalan̪ara – kalaɲara ‘cut.APPR’ – ‘fly.APPR’
	/m/	waɻan̪ara – waɻamara ‘send.APPR’ – ‘mouth.UTIL’		

The liquids /r, l, ɻ/ are contrasted with one another in (2.17) and with the apical plosives /t, ʈ/ in (2.18). In (2.19), the semivowels are contrasted with one another, palatal /j/ with the palatal plosive /c/, and labiovelar /w/ with the labial plosive /p/ and velar plosive /k/.

(2.17) Contrasts between liquids

/r l ɻ/	wiriwiria ‘meat along ribs’	wiliwilia ‘initiation ground’	wiɻiwiɻia ‘bird sp.’

[31] Strictly speaking this is not a lexical form but a post-lexical one, showing reduction of /n̪t̪/ → /n̪/.

(2.18) Contrasts between liquids and apical plosives

/t/:	/r/	ŋata – ŋara '1sg'– '1du'	/l/	pati:ca – pali:ca 'carry:MID' – 'wade'	/ɻ/	kata – kaɻa 'again'– INTERROG
/ʈ/:	/r/	ŋaʈaa – ŋaraa 'reed sp.'– 'shell knife'	/l/	juʈaa – julaa 'inside' – 'fish sp.'	/ɻ/	piʈia – piɻia 'bad'– 'tree sp.'

(2.19) Contrasts between semivowels, and plosives

/j/:	/c/	janita – canita 'soon' – 'search:DES'	/w/	ju:ta – wu:ta 'first' – 'give:DES'
/w p k/		walata̪ – palata̪ – kalata̪ 'miss' – 'hit' – 'cut'		

Contrasts are shown between vowels qualities in (2.20), and vowel lengths in (2.21).

(2.20) Contrasts between vowel qualities

/a i u/	pata – pita – puta 'west' – 'smell' – 'behind'	/a: i: u:/	ka:ca – ki:ca – ku:ca 'shelter' – 'approach' – 'bathe'

(2.21) Contrasts between vowel lengths

/a a:/	panta – pa:nta 'soon' – 'bite:N'	/i i:/	nita – ni:ta 'name' – 'same'	/u u:/	puta – pu:ta 'behind' – 'pull:DES'

2.2 Vowel phonotactics

This section surveys the phonotactics of vowels, focusing on vowels at the right edge of the word in §2.2.1, vowel hiatus in §2.2.2, the distribution of vowel quality in §§2.2.3–§2.2.4, and length in §2.2.5.

2.2.1 Vowels at the right edge of the word

Before examining vowel phonotactics more generally it will be useful to discuss the analysis of vowels at the right edge of the word. The right edge of the word in Kayardild is the focus of several phonological alternations, both lexical and post-lexical, which apply to vowels. The analysis of these, and of the segmental content ascribed to the right edge of the word, will differ in part here from the analysis in Evans (1995a). Specifically, (i) some alternations which are analysed as lexical or morphological in Evans (1995a) but which are sensitive to speech rate or style are analysed here as post-lexical; and (ii) contrastive, word final sequences /aa/ and /uu/ are distinguished in some case where Evans has /a/ and /u/.

The following subsections examine the 'termination' in §2.2.1.1, word final reduction in §2.2.1.2, breath group final truncation in §2.2.1.3 and the status of word final double vowels in §2.2.1.4.

2.2.1.1 The termination, T

One very obvious set of lexical alternations in Kayardild is the one which involves segmental additions and deletions at the right edge of almost every word. The phenomenon will be analysed here in terms of the phonological realisation of a meaningless, formal morphological category which will be termed the **termination**, abbreviated as T. The termination appears at the end of the word and in most cases its phonological form depends solely on the phonological shape of the stem which precedes it. An example of each possible, phonologically regular realisation of T is shown in (2.22).[32] These regular realisations of T are analysed by Evans for the most part as a nominative case morpheme (1995a:136–38); for further discussion of the morphological analysis adopted here see Ch.3, §3.7.

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[32] Stems cannot end in sequences other than those listed in (2.22), cf Ch.3, §§3.3.1, 3.6.2.

(2.22) Phonologically conditioned forms of stem+T

Stem properties			Example		
final string		moraicity	gloss	stem	stem+T
Short vowel	/a/	μ	'foot'	/ca/	/caa/[33]
	/a/	μμ	'man'	/ʈaŋka/	/ʈaŋkaa/
	/a/	>μμ	'big'	/cuŋara/	/cuŋara/
			'who'	/ŋaːka/	/ŋaːka/
	/i/		'bad'	/piʈi/	/piʈia/
	/u/		'woman'	/maku/	/makua/
Double vowel	/aa/		-fABL	-/naa/	-/naa/
	/uu/		-fPROP	-/kuu/	-/kuu/
/r/	/r/		'stone'	/kamar/	/kamara/
Other coronal consonant	/ɻ/		'eye'	/mipuɻ/	/mipuɻʈa/
	/ɳ/		'hollow'	/campaɳ/	/campaɳʈa/
	/l/		'leaf'	/wiril/	/wirilta/
	/n/		'tooth'	/ʈaman/	/ʈamanta/
	/ɲ/		'low tide'	/kapiɲ/	/kapinta/
	/t̪/		'animal'	/jaɻput̪/	/jaɻputa/
	/c/		'one'	/waɻŋiːc/	/waɻŋiːta/
Velar consonant	/ŋ/		'together'	/t̪at̪uŋ/	/t̪at̪uŋka/
	/k/		'tree sp.'	/kirik/	/kirika/
	/lŋ/		'ray sp.'	/kuʈalalŋ/	/kuʈalalŋka/
	/rŋ/		'two'	/kiarŋ/	/kiarŋka/
	/ɻk/		'below'	/jaɻk/	/jaɻka/
	/lk/		'mud'	/maʈalk/	/maʈalka/
	/rk/		'alone'	/kan̪t̪ark/	/kan̪t̪arka/

The arguments behind the phonological and morphological analysis of T will be given in Ch. 3, §3.7, though the results can be summarised as follows. It is assumed that the rightmost underlying morph of any grammatical word in Kayardild is T. In the

[33] On the alternative form /caɻʈa/, see Ch.3, §3.12.1.

phonologically regular cases the category T is realised as /a/, /ka/ or /ta/, or it fails to have any overt realisation. In certain morphologically specific cases though, the rightmost morph of a word cumulatively realises both T and some other morphological category, in which case T has no independent phonological realisation of its own. Some examples are listed in (2.23).

(2.23) Some cumulative morphs which realise T

Usual morph				Cumulative morph, with T	
a.	/karaɲ/	fGEN		/kara/	fGEN.T
b.	/palat̪/	fPL		/palaa/	fPL.T
c.	/naŋ/	fNEG		/na/	fNEG.T
d.	/ɻiŋ/	fALL	(spoken & song registers)	/ɻi/	fALL.T
e.	/ɻuŋ/	fALL	(song register only)	/ɻu/	fALL.T

When a word ends in the cumulative morph fALL.T (2.23d,e) it comes to possess a final /i/ or final /u/ vowel. This is the only case of word final /i/ in Kayardild and the only case of word final /u/ outside of the double vowel sequence /uu/; normally a stem that ends in /i/ or single /u/ will be followed by an /a/ realisation of T, cf. (2.22) above.

2.2.1.2 Word final reduction

In addition to the realisation of T, which occurs at the lexical level, there are two post-lexical processes that alter the right edge of words. The first is sensitive to speech rate and style, and will be referred to as **word final reduction**. The second is absolute in its effect, i.e., insensitive to speech rate and style, and will be referred to as **breath group final truncation** or **β-truncation** — the 'β' symbol will be used throughout the dissertation to represent the **breath group** (a prosodic constituent), much as ‘σ’ represents the syllable (on the breath gorup in general, see further Ch.5 §5.1.4).

Word final reduction alters the word final sequences /ia/, /ua/, /a/ and /i/ via processes which will be discussed in this section. It also typically shortens word final double vowel /aa/ and /uu/, as discussed shortly in §2.2.1.4.

The sequences /ia/ and /ua/ are realised in a highly variable manner. As mentioned in §2.1.6.4 the high vowels may become very short, resulting in percept like [ja] or [wa] (this is particularly true of /ua/ → [wa]); alternatively, the /a/ vowel may be centralised, shortened or phonetically deleted, or the two vowels may coalesce into mid vowels:[34]

(2.24) Word final reduction of /ia/, /ua/

/ia/	→	[ia] ~	[ĭa] ~	[ja] ~	[a] ~	[iə] ~	[i] ~	[e] ~ [ɛ]
/ua/	→	[ua] ~	[ŭa] ~	[wa] ~	[a] ~	[uə] ~	[u] ~	[o] ~ [ɔ]

It is worth emphasising that this variation is purely phonological. Unlike the realisation of T, there are no cases of word final reduction which are morphologically conditioned. Accordingly, any rate- or style-dependent variation which is found in Kayardild between word final [i] and [ia] for example, or [u] and [ua] is analysed here as due to post-lexical, word final reduction, and not due to a lexical level alternation. This contrasts with the analysis of Evans (1995a), in which the alternation between word final [i]~[ia] is built

[34] I refrain from providing spectrographic examples here, since any individual token is likely to be so strongly influenced by segmental (i.e., consonantal) environment and speaking rate as to be largely uninformative. Future studies, covering sufficently many tokens that such effects could be taken properly into account, would be welcome.

into the allomorphy of the locative suffix (1995a:138–42),[35] and in which the 'nominative suffix' [a] appears optionally after stems ending in /u/ and /i/ (1995a:136–38).[36]

Word final, post-consonantal /a/ and /i/[37] may both be realised with a heavily centralised quality and can be short, to the point of phonetic deletion in some rare cases. Again, rate- and style-dependent variation in these vowels is analysed here as post-lexical and due to word final reduction. In contrast, Evans (1995a) analyses the phonetic alternation between word final [ɻi̥] and [ɻ̊][38] in the allative suffix as (presumably free) allomorphy.

2.2.1.3 Breath group final truncation

Like word final reduction, β-truncation is post-lexical, but unlike word final reduction, its effects are independent of speech rate or style.

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[35] The analysis here will be that the formal locative suffix fLOC ends in /i/, and that the following /a/ realises T. In cases where /i+a/ surfaces (at the lexical level) as word final /ia/, the /ia/ string may then undergo word final reduction. (Under some circumstances the underlying /i+a/ surfaces lexically as /ja/, cf Ch.4, §4.4.)

[36] The analysis here is that Evans' nominative suffix is actually T, which is realised as /a/ after stems ending in /i/ and /u/; the resulting, word final /ia/ and /ua/ strings may then undergo word final reduction.

[37] Word final, post-consonantal /u/ only occurs in song. The phonetics of Kayardild song are interesting in a number of respects, are but beyond the scope of the present study.

[38] I hear a word final vowel in all cases where /i/ is not deleted by β-truncation (§2.2.1.3). Some of Evans' examples which are transcribed without a word final /i/ in the allative suffix (1995a:150,exx.4-54,4-56) appear to be taken from Wurm's (1960) recordings, in which I hear a vowel present.

The breath group (β) in Kayardild is typically a stretch of speech bounded by planned pauses (cf Ch.5, §5.1.4). β-truncation applies to any word which stands in β-final position, deleting any word final short vowel. Examples of stems, stems plus T, and stems plus T plus the effects of β-truncation are shown in (2.25).

(2.25) Stems, the termination T, and β-truncation

Stem		Stem+T		
gloss	underlying form	underlying form	after lex. phonology	after β-truncation
'man'	/ʈaŋka/	/ʈaŋkaa/	/ʈaŋkaa/	[ʈaŋka]
'woman'	/maku/	/makua/	/makua/	[maku]
'bad'	/piʈi/	/piʈia/	/piʈia/	[piʈi]
'big'	/cuŋara/	/cuŋara/	/cuŋara/	[cuŋar]
-fABL	-/naa/	-/naa/	-/naa/	-[na]
-fPROP	-/kuu/	-/kuu/	-/kuu/	-[ku]
-fGEN	-/kaɾaŋ/	-/kara/	-/kara/	-[kar]
-fNEG	-/naŋ/	-/naŋ/	-/na/	-[n]
-fALL	-/ɻiŋ/	-/ɻiŋ/	-/ɻi/	-[ɻ]
-fALL (song only)	-/ɻuŋ/	-/ɻuŋ/	-/ɻu/	-[ɻ]

2.2.1.4 Word final double vowels

This section presents arguments for two points of analysis regarding word final vowels in Kayardild. The first point relates to the existance of final, double /aa/ and /uu/ in positions where one typically hears phonetically short [a] and [u]. The second point relates to the choice of representation, as double vowels /aa/ and /uu/ rather than long vowels /aː/ and /uː/.

Most word final, double /aa/ vowels result from the addition of T to stems of one or two morae that end in /a/, as in /ʈaŋka/ 'man' → /ʈaŋkaa/ 'man.T', cf (2.22). These double vowels correspond to the only word final long vowels recognised in Evans

(1995a). However, there is good reason to recognise additional double vowels /aa/ and /uu/, which appear exclusively in the morphological environments shown in (2.26).

(2.26)

Suffix form	Function
a. /naa/	formal ablative (fABL)
b. /palaa/	formal plural (fPL)
c. /kuu/	formal proprietive (fPROP)

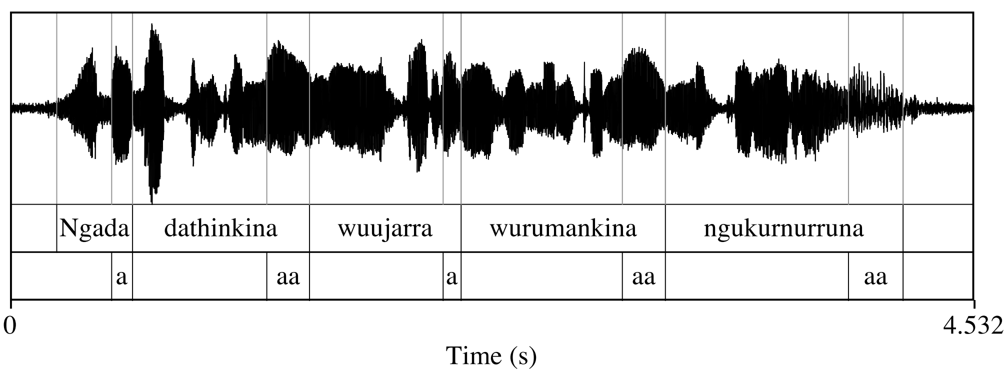
As we already know from words such as /cuŋara/ 'big.T' versus /ʈaŋkaa/ 'man.T' in (2.25), it is typical for word final, single /a/ to delete entirely during β-truncation, while word final double /aa/ is truncated down to /a/, in which case the word remains vowel-final. The two word final morphs (2.26a,b) are generally heard as ending in short [a], but those [a] vowels fail to delete during β-truncation: words ending in (2.26a,b) remain vowel-final. A reasonable hypothesis to pursue then, is that the non-truncating [a] vowels are phonologically /aa/. In doing so, it will be necessary to suppose that word final double /aa/ vowels surface as phonetically long [aː] in short words such as /ʈaŋkaa/ 'man.T' (i.e., words of three morae or less), but reduce to [a] otherwise, as a result of word final reduction. In addition to this observation — that it would be *possible* to analyse (2.26a,b) as ending in /aa/ — there are two further pieces of evidence which can be cited in favour of the double vowel analysis.

First, the word final /aa/ sequences in (2.26a,b) are occasionally heard in clear speech as distinctively long, in utterances where word final single /a/ vowels are not correspondingly lengthened. A clear example is sentence (2.27), shown aligned with the corresponding waveform in (2.28), against which the words and their underlying final vowels are transcribed.[39]

(2.27)	*Nga-da*	*dathin-ki-na-*	*wuu-j-arra-*	*wuruman-ki-na-*
	ŋat̪-ta	t̪at̪in-ki-naa-ø	wuː-c-ŋara-ø	wuɻuman-ki-naa-ø
	1sg-T	there-fLOC-fABL-T	put-TH-fCONS-T	billy-fLOC-fABL-T
	1sg-Ø	there-Ø-PRIOR-Ø	put-Ø-PAST-Ø	billy- Ø-PRIOR-Ø

nguku-rnurru--na-
ŋuku-ɳuru-ki-naa-ø
water-fASSOC-fLOC-fABL-T
water-ASSOC-Ø-PRIOR-Ø
'I put the billy there with water in it.' [W1960]

(2.28)



Secondly, the fABL morph (2.26a) acts in word *internal* positions as if it ends in a double vowel /aa/, in contrast to morphs ending in short /a/. Compare the word internal stems in (2.29), which appear before fOBL.T. The stem /cina/ which ends in single /a/ retains a single, final vowel before the /n̪t̪a/ of fOBL.T, while fABL contains a double vowel.

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[39] The durations are, in order: /a/ 0.099s, /aa/ 0.202s, /a/ 0.085s, /aa/ 0.203s, /aa/ 0.256s.

(2.29)	Stem		Stem + fOBL.T
	gloss	underlying form	
a.	‘where-’	/cina-/	/cina-n̪t̪a/
b.	‘here-fLOC-fABL-’	/ʈan-ki-naa-/	/ʈankinaa-n̪t̪a/

On the weight of this evidence, I conclude that fABL (2.26a), and also fPL (2.26b) end in a double /aa/ vowel, which is usually shortened to [a] by word final reduction.

The evidence for word final /uu/ is partly parallel. The final /uu/ of a word final fPROP morph (2.26c) is occasionally heard as distinctively long,[40] and it acts as a double vowel in word internal positions, as shown in (2.30).

(2.30)	Stem		Stem + fOBL.T	Stem + fSAME.T
	gloss	underlying form		
a.	‘straight-’	/cunku-/	/cunku-n̪t̪a/	/cunku-ta/
b.	‘wait-fPROP-’	/ŋakat̪-kuu-/	/ŋakat̪uu-n̪t̪a/	/ŋakat̪uu-ta/[41]

Usually, word final /uu/ is realised as [u], in which case it may be neutralised with word final /ua/ which can also surface as [u]. Nevertheless, final /uu/ and /ua/ still differ, in that

[40] I have noticed the long [uu] occurring in the speech of several speakers, on each occasion in connection with a specific genre in which the speaker declares his or her intention to speak ‘correct’ Kayardild, for the benefit of others who ought to listen. The pronunciation of word final /uu/ as [uː] is almost certainly archaic — the /uu/ derives historically from */uɻu/, and its typical pronunciation has probably progressed from *[uɻu] > *[uu] > [u] — and perhaps therefore lends a note of authority to the speaker’s words in such cases.

[41] The source of this form is Evans (1995a:392.ex.9-19).

/uu/ never surfaces as [ua] whereas /ua/ often does. Again, on the weight of the evidence, I conclude that fPROP (2.26c) ends in a double vowel /uu/, which is normally shortened to [u] by word final reduction.

The discussion immediately above had focussed on the contrast between word final /a/~/aa/ and /u/~/uu/, but not yet on the reasons for representing final /aa/ and /uu/ as double short vowels rather than as single, long vowels. This choice is based on a number of aspects of Kayardild phonology whose analysis is simplified by it.[42]

A first consideration relates to the overt realisation of T in bimoraic words like /caa/ 'foot.T' (whose stem is /ca/) and trimoraic words like /ʈaŋkaa/ 'man.T' (whose stem is /ʈaŋka/). If these words end in /aa/, then it can be stated that in all cases where T is overtly realised immediately after a vowel, it is /a/; there is no need to resort to the more complicated statement that overtly realised T is (i) /a/ after /i/ or /u/, or (ii) lengthens a stem final /a/.

The second consideration relates to β-truncation. If word final /aa/ and /uu/ are represented as double vowels, then β-truncation can be described simply, as deleting the last vowel of any vowel-final word.

Thirdly, the morphophonology of the formal oblique (fOBL) suffix treats /aa/ and /uu/ as if they were two short vowels. In Kayardild suffixes, laminal consonants only surface as dental after short /a/ and /u/. After /i/ and long vowels /aː, uː, iː/ one finds

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[42] The diachronic explanation for why the vowels in the fABL allomorph /naa/ and fPROP allomorph /kuu/ are treated as double vowels, is that they derive respectively from */napa/ and */kuɻu/ (both of which still appear in the modern language, as additional allomorphs of fABL and fPROP).

laminal palatals only.[43] Examples (2.29b) and (2.30b) above illustrate the fact that fOBL is realised at the surface with laminal dental /n̪t̪/ after /aa/ and /uu/, not with lamainal palatal /ɲc/.

2.2.2 Vowel hiatus and vowel–semivowel–vowel sequences

In Evans' (1995a) analysis of Kayardild, there is no vowel hiatus. Sequences which sound phonetically like two adjacent vowels are analysed as containing an intervening semivowel in their phonological representation, for example [au] is phonologically /awu/ and [ia] is phonologically /ija/ (1995a:60–61). In support of this analysis, Evans refers to analyses of the Australian languages Dyirbal (Dixon 1972), Ngiyambaa (Donaldson 1980) and Diyari (Austin 1981) in which similar relationships between phonetic hiatus and phonological vowel–semivowel–vowel (VSV) sequences have been argued for. In both Diyari and Ngiyambaa there are robust generalisations regarding morphophonological alternations which can be captured by assuming that superficial phonetic hiatus — and in the case of Ngiyambaa, long mid vowels — are realisations of phonological VSV strings. This is not so in Kayardild. In Kayardild, some generalisations call for an analysis in terms of phonological strings such as /awu/ while others call for /au/. To take an example, consider the formal donative (fDON) suffix /wu-c-/ and the formal locative.oblique (fLOC.fOBL) /kurka/. In the analysis advocated here, Suffixing fDON to a stem ending in

[43] General arguments regarding the phonology of vowels and laminals in suffixes are complicated by a number of factors. For a full account see Ch.4, §4.6. For an overview, see §2.2.4 below.

/a/ produces a string containing /awu/, while suffixing fLOC.fOBL to the same stem produces a string /au/, because fLOC.fOBL is one of several suffixes whose initial /k/ deletes after anything but a preceding nasal.[44] This is shown in (2.31).

(2.31)

	Stem		Stem + fDON	Stem + fLOC.fOBL
	gloss	underlying		
a.	'man'	/ʈaŋka-/	/ʈaŋkawuc-/	/ʈaŋkaurka-/
b.	'big'	/cuŋara-/	/cuŋarawuc-/	/cuŋaraurka-/

There are good reasons to resist collapsing these two examples — by claiming either that suffixing fDON produces /au/ (like fLOC.fOBL does), or that suffixing fLOC.fOBL produces /awu/ (like fDON does). Namely, fDON behaves consistently as if it begins in /w/ — the semivowel undergoes progressive nasalisation (2.32d) and palatalisation (2.32e); meanwhile fLOC.fOBL behaves as if it begins either with /k/ (2.32d) or with no consonant at all (2.32a,b,c,e).

(2.32)

	Stem		Stem + fDON	Stem + fLOC.fOBL	Stem + fLLOC-fINCH-TH
	gloss	underlying			
a.	'man'	/ʈaŋka-/	/ʈaŋkawuc-/	/ʈaŋkaurka-/	/ʈaŋkaiːwat̪-/
b.	'grass'	/wiril-/	/wirilwuc-/	/wirilurka-/	/wiriliːwat̪-/
c.	'stone'	/kamar-/	/kamarwuc-/	/kamarurka-/	/kamariːwat̪-/
d.	'here'	/ʈan-/	/ʈanmuc-/	/ʈankurka-/	/ʈankiːwat̪-/
e.	'animal'	/jaɻput̪-/	/jaɻpujuc-/	/jaɻput̪urka-/	/jaɻput̪iːwat̪-/

[44] Ch.4, §4.2.1.2 provides further data that motivate an analysis in terms of simple deletion of /k/ in fLOC.fOBL, and in fLLOC (mentioned below).

In the analysis of Evans (1995a), which excludes hiatus, fLOC.fOBL has an allomorph /wurka/ after vowels. At first glance this is quite reasonable: assuming that what is at issue is phonologically conditioned allomorphy, fLOC.fOBL can be taken as /urka/ after liquids and plosives, /kurka/ after nasals,[45] and /wurka/ after vowels. However, consider now a similar /k/-initial suffix, but one in which the following vowel is /iː/. The collative CASE is realised by the sequence fLLOC-fINCH-TH (formal long locative, formal inchoative, and thematic) /kiː-wa-t̪-/, also shown in (2.32) above. On a parallel analysis, fLLOC will also begin with a vowel after liquids and plosives, and with /k/ after nasals,[46] but after vowels fLLOC will need to begin not with /w/ but with /j/ (e.g. in /ʈaŋkajiːwat̪-/). The difference in the initial semivowel, between fLOC.fOBL with /w/ (before /u/) and fLLOC with /j/ (before /iː/), is precisely the kind of variation which can be simplified by assuming that no semivowel is present: both fLOC.fOBL and fLLOC begin with /k/ after nasals and with no consonant elsewhere. In sum, there are Australian languages such as Diyari and Ngiyambaa in which the phonological analysis is simplified by assuming semivowels to be present, but in Kayardild, the simplest analysis is often obtained by making the opposite assumption: that no semivowel is present, and that vowels are in hiatus.

The upshot of this is that in the lexical phonology, strings such as /au/ and /awu/ are both tolerated in Kayardild, even though at the phonetic level they are neutralised:

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[45] After one nasal, analysed as /ɲ/ is this dissertation, it is /curka/.

[46] Again, it would begin with /c/ after /ɲ/.

both are be realised by the same set of phonetic variants, from [au] to [awu] to [aw] and so forth.[47]

2.2.3 The distribution of vowel quality across syllables

The quality of a vowel in one syllable is not constrained in any absolute way by the quality of vowels in neighbouring syllables. This is shown in the examples in (2.33).

[47] To be sure, one could propose a process of semivowel insertion to change /au/ → /awu/ (or deletion, to change /awu/ → /au/) in order to create a greater homogeneity among lexical phonological representations, but the motivations for doing so would appear to be misplaced. First, the inserted (deleted) /w/ will often be immediately deleted (inserted) again in the phonetics. As such, the description of the language still requires a process of insertion and a process of deletion. Moreover, the end result of those processes is surface (phonetic) variation, yet one, and only one, of those processes is now treated as post-lexical, with no motivation beyond the desire to create lexical representations with certain properties (e.g. no hiatus) — despite their being motivated neither by the facts of surface (phonetic) variation nor of demonstrable, lexical alternations.

(2.33) Independence of vowel quality across syllables

		/i/		/a/		/u/
/i/__/i/	‘cave’	/ŋiliria/	‘sea	/ciralk̪ia/	‘tree sp.’	/pilkuria/
/i/__/a/		/ŋilira/	grass’	/ciralk̪a/		/pilkura/
/i/__/uː/		/ŋiliruu/		/ciralk̪uu/		/pilkuruu/
/a/__/i/	‘digging	/kat̪iria/	‘open	/kalaria/	‘short’	/ʈamuria/
/a/__/a/	stick’	/kat̪ira/	space’	/kalara/		/ʈamura/
/a/__/uː/		/kat̪iruː/		/kalaruu/		/ʈamuruu/
/u/__/i/	‘dead’	/kuɻiria/	‘bullrush	/kuɻkaŋkia/	‘jealous’	/muluria/
/u/__/a/		/kuɻira/	sp.’	/kuɻkaŋka/		/mulura/
/u/__/uː/		/kuɻiruu/		/kuɻkaŋkuu/		/muluruu/

Stems are each followed: by fLOC+T in the V__i condition;
by T in the V__a condition; and by fPROP in the V__uː condition.

Despite the lack of absolute restrictions on vowel quality across syllables though, Evans (1995a:77–78) documents the existence in Kayardild of what is termed ‘sporadic vowel harmony’. Section 2.2.3.1 investigates this topic, with the aim of shedding light on the nature of ‘vowel harmony’ in Kayardild, a language which permits all sequences of vowel qualities in neighbouring syllables.

2.2.3.1 Nonproductive vowel harmony in synchrony and diachrony

Within the Kayardild lexicon a relatively strong tendency can be observed at the statistical level towards [±back] harmony in neighbouring high vowels.

In a set of 1,942 nominal stems, a total of 1,520 pairs of adjacent syllables contained high vowels only. The preponderance of vowel pairs, expressed relative to the expected value (i.e., taking into account the difference in the overall number of /i/ and /u/ vowels) is shown in (2.34).

(2.34) High vowels in adjacent syllables in Kayardild nominal stems, relative to expected values based on a random distribution
(1,520 syllable pairs from 1,942 stems; 1910 /u/ vowels, 1130 /i/)

		Second syllable	
		/i/	/u/
First syllable	/i/	1.87	0.50
	/u/	0.46	1.31

The results in (2.34) are striking. Only half as many disharmonic pairs are found as would be expected under a random distribution, while almost twice as many /i–i/ pairs and an extra one third as many /u–u/ pairs are found. [48] (Note that because of the preponderance of /u/ vowels in the sample, one expects >50% of pairs to be harmonic even under a random distribution.) These facts provide an informative backdrop for the following discussion of Evans' (1995a:77–78) 'sporadic vowel harmony'.

Although there are no regular, synchronic phonological processes of vowel harmony in spoken Kayardild, it appears that there may be a gentle diachronic trend towards increasing harmony in the lexicon. The trend is strongest in the context of liquids and retroflexes, which as mentioned in §2.1.6.2 above, will centralise and neutralise adjacent high vowels. In light of this, the diachronic process of harmony can interpreted informatively as follows: /i/ and /u/ neutralise phonetically in certain environments; speakers then occasionally recategorise the underlying quality of the neutralised surface vowel so as to align it with the statistical tendency in the lexicon towards harmony. Let us consider two examples from the spoken language, before

[48] A comparable test was run with the /a/ vowel, which turns out to exhibit not even a weak tendency towards harmony either with /i/ or with /u/.

turning to one case in Kayardild song in which a suffix productively harmonises with its stem.

In spoken Kayardild, the proto Southern Tangkic formal allative (fALL) suffix */ɭuŋ/, has undergone a change of */u/ > /i/ (a well as */ɭ/ > /ɻ/) to become /ɻiŋ/, but only when it fulfils one of several functions which typically place it after an /i/ vowel in a preceding formal locative suffix /ki/. In another function, where the reflex of */ɭuŋ/ attaches to directly to a root, it has remained unharmonised as /ɻuŋ/, as in e.g. /ɻa-ɻuŋ/ 'south-fALL'. Interestingly, the *stem* /ɻi/ 'east' is itself harmonised by some speakers in /ɻu-luŋ/ 'east-fALL',[49] though other speakers still use the original form /ɻiluŋ/, or alternate between /ɻiluŋ/ and /ɻuluŋ/.

Rarely, diachronic harmony has affected low vowels. The repeated word */wuɲinta wuɲinta/ 'thief thief' has become the modern reduplicant *wungunduwungundu* /wuŋuntu-wuŋuntu/ with */i/ and */a/ > /u/ (Evans 1995a:77). The source of the modern form is clear: /wuɲinta/ ← /wuɲic-n-ta/ is literally 'steal-NOMINALISER-T', moreover the nominal *wungunduwungundu* takes a compliment marked with the formal oblique (fOBL) suffix, which would be highly unusual for anything other than a nominalised verb.

In Kayardild song, the formal allative morph mentioned above exhibits what could be regarded as regular, synchronic vowel harmony. In the same contexts where the spoken language now exclusively uses /ɻiŋ/, fALL in song appears as /ɻiŋ/ when preceded by /i/ but

[49] The /l/ in /ɻiluŋ/ ~ /ɻiluŋ/, where one would expect /ɻ/ (from */ɭ/), is an exception common to all Tangkic languages and undoubtedly reflects an idiosyncratic change of */ɭ/ > */l/ at some early stage.

as /ɻuŋ/ when preceded by /u/ or /a/. Presumably, the song phonology faithfully maintains a diachronic stage intermediate between proto Southern Tangkic (with */ɭuŋ/ alone) and modern spoken Kayardild (with /ɻiŋ/ alone). If so, it is a point worth noting, that despite the diachronic drift towards harmony in its lexicon, spoken Kayardild has actually *lost* a process of vowel harmony that arose in its phonology.

2.2.4 Vowel quality and adjacent consonants

In many Australian languages vowels cannot freely combine with adjacent laminal consonants, either following the vowel, or preceding it, or both (Dixon 1980:150–54).[50] No such restriction is found in absolute terms in Kayardild, either in stressed or in unstressed vowels, as shown in (2.35).

[50] In some languages a similar restriction applies to following apicals (Dixon 1980:155–56); this is not so in Kayardild.

(2.35) Vowels and neighbouring laminal consonants

Vowel quality & stress		after /(n̪)t̪/	after /(ɲ)c/	before /(n̪)t̪/	before /(ɲ)c/
i	stressed (initial syll.)	/t̪ipilia/ 'jellyfish sp.'	/cipan̪a/ 'Mo. in law'	/pit̪uː/ 'smell.PROP'	/picura/ 'shell sp.'
	unstressed (2nd syll.)	/t̪in̪tira/ 'dry'	/miɲcira/ 'smashed nut'	/ŋaɲcit̪ua/ 'shell sp.'	/paɲcicuu/ 'smell.POT'
a	stressed	/t̪awalta/ 'yam sp.'	/cawalta/ 'boot'	/mat̪alia/ 'seahawk'	/macaria/ 'navel'
	unstressed	/pat̪alia/ 'turtle sp.'	/pacalia/ 'tree sp.'	/kalat̪a/ 'cut'	/kalaca/ 'jump'
u	stressed	/t̪uwalka/ 'fish sp.'	/cuwalta/ 'unburied'	/kut̪inia/ 'reed sp.'	/kucicia/ 'young'
	unstressed	/kalat̪uu/ 'cut.POT'	/kalacuu/ 'jump.POT'	/ɻukut̪inaa/ 'Rukuthi.ABL'	/kakucinaa/ 'uncle.ABL'

At a statistical level there are some tendencies to be observed regarding vowels and adjacent laminals. As in other Australian languages, the high, front vowel /i/ is preferred next to the palatals /c, ɲ/, with /a/ and /u/ preferred next to the dentals /t̪, n̪/.

In root initial position, there are just two Kayardild words (setting aside recent borrowings from English) which begin with /t̪i/, but over a dozen each beginning with /t̪a/ and /t̪u/.

In nominal roots, final laminals and their preceding vowels only combine freely in CVC roots; longer roots ending in laminals only end in /at̪/, /ut̪/ or /ic/. The latter fact could be taken as evidence that final laminals are actually neutralised in polysyllabic nominal roots. Though the proposal will not be taken up here it is not without merit, given its relationship to an apparent gap in the inventory of root shapes attested in Kayardild. Namely, Kayardild roots may end in either of the laminal plosives /t̪/ or /c/, yet they only end in one laminal nasal, treated in this dissertation as /ɲ/; there is no evidence for a root ending in /n̪/. However, Kayardild roots ending in /ɲ/ are all polysyllabic, and as just observed, final laminals in polysyllabic roots are not contrastive. In a slightly different language, Kayardild′, which possessed final laminal nasals in CVC roots, we might find both /ɲ/ and /n̪/ in root-final position.

Verb stems end in a thematic element, TH, which takes the phonological form of either of the laminal plosives /t̪/ or /c/; the segment preceding TH is always a short or long vowel, and although the choice between the two thematics is lexically determined to an extent, the laminal dental TH only ever follows short /a/ or /u/ vowels; palatal TH is unrestricted.

In Ch.4, §4.6 the argument is made that in Kayardild *suffixes*, laminal dentals can only follow short /a/ and /u/; laminal palatals are unrestricted.

2.2.5 The distribution of vowel length

There are no absolute restrictions on vowel length relative to position within the word; vowels of either length may follow or precede one another in adjacent syllables, and both lengths can be found in any syllable in the word. Vowels of both lengths may be stressed or unstressed (cf Ch.5). That said, long vowels are much less frequent in Kayardild than short vowels. In addition, long vowels cannot appear finally in a nominal root (all verb roots and stems end in the thematic TH, before which both long and short vowels can be found).[51]

It is somewhat unclear if there exist any significant restrictions on the segments which can immediately follow a long vowel. Evans notes that no long vowel is ever followed by a triconsonantal cluster (1995a:60),[52] but given the rarity in general of such clusters, and the relative infrequency of long vowels, this may well be an accidental gap. Evans also mentions that sequences consisting of a long vowel follwed by a cluster of peripheral consonants (i.e., dorsal velars or labials) is unattested (1995a:61), but the words *balkajiwaangka* /palkaciwaːŋka/ "sister turtle" (Evans 1992:4; Evans 1995a:641) and the recent loan *maangku-* /maːŋku/ 'mango' provide counterexamples.

2.3 Consonant phonotactics

This section surveys the phonotactics of consonants, especially consonant clusters, in Kayardild. A general overview of consonant phonotactics in Australian languages is given in §2.3.1, after which the empirical facts for Kayardild are set out in §2.3.2, and discussed from several points of view in §2.3.3. A formal, constraint-based analysis is provided in §2.3.4.

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[51] Post-lexical, phonetic shortening of vowel length was mentioned in §2.1.6.3. See also §2.4.2 below regarding Evans' account of to two alternations, in which vowel length in one syllable is claimed to be sensitive to the content of the next syllable.

[52] Evans' observations are made with respect to syllable structure, but for the purposes of consistency with the presentation in §2.3 below, are rephrased here in terms of following consonant clusters.

2.3.1 Consonant phonotactics in Australian languages

The striking similarities in the phonologies of Australian languages extend beyond their contrastive segment inventories to their phonotactics. Several core patterns exist which can be found at some level in almost every language, as documented by Dixon (1980; 2002) and most extensively by Hamilton (1996). These are: (i) a patterning of places of articulation into three 'major classes'; (ii) certain positional neutralisations of the places of articulation within a single major class; (iii) a sequential ordering within clusters of the major classes of places of articulation; and (iv) a sequential ordering within clusters of manners of articulation.

The major classes of place of articulation are **apical**, comprising apical alveolar and apical retroflex; **laminal**, comprising laminal dental and laminal palatal; and **peripheral**, i.e., the places articulated at the 'periphery' of the vocal tract, comprising the labial and dorsal velar places of articulation. Both the apical and laminal major classes consist of coronals; peripherals are non-coronal. The two coronal major classes often exhibit within-class, positional neutralisations. The contrast between the two apical places of articulation is rarely maintained in word initial position, and is almost never retained in a post-consonantal position. The contrast between the two laminal places of articulation is often suspended in pre-consonantal position.

Restrictions on the sequencing within clusters of both place of articulation and manner of articulation are very common if not universal among Australian languages, although the specific domains within which the restrictions apply do vary. In almost all languages, the restrictions apply without exception within individual morphs; in some languages they also hold across morph boundaries. Restrictions on place can be summarised in terms of Hamilton's (1989) 'articulator scale', shown in (2.36).

(2.36) Preference scale for place of articulation in clusters, after Hamilton (1989)

Apical	—	Laminal	—	Dorsal velar	—	Labial
More likely at the left edge of a cluster						More likely at the right edge of a cluster

The further to the left a place is in the scale in (2.36), the more likely it is to be found at the left edge of clusters; the further to the right a place is, the more likely it is to be found at the right edge of clusters, where 'more likely' cashes out both in terms of absolute restrictions (in some languages) and frequency of attestation in the lexicon (in others). Put another way, clusters typically contain a sequence of places of articulation such that apicals precede laminals which precede dorsal velars which precede labials.

Manner restrictions are less easily summarised than place restrictions. Hamilton (1996:154) finds the tendencies shown in (2.37a) for pre-consonantal segments and (2.37b) for post-consonantal segments. The scales are read such that both A>B and B<A indicate that A is commoner than B.

(2.37) Preference scale for manner of articulation in clusters, after Hamilton (1996)

a. More likely to appear at the left edge of a cluster
   Liquid > Nasal > Plosive, semivowel

b. More likely to appear at the right edge of a cluster
   Liquid < Nasal, semivowel < Plosive

In addition to the broad patterns in (2.37) some sub-regularities exist. In clusters without plosives, Hamilton finds nasal+nasal the most common, followed by liquid+nasal and liquid+semivowel, then nasal+semivowel. Other clusters types are very rare (at least within the domain to which sequencing restrictions apply).

Kayardild adheres to all of these generalisations. As we will see, minor places of articulation are neutralised in the usual way; major places of articulation are sequenced such that apicals precede laminals which precede peripherals, without exception even across morph boundaries; for manner of articulation, liquids precede nasals which precede plosives, while semivowels occur in clusters only after liquids; nasal+nasal and plosive+plosive clusters occur, but not liquid+liquid or semivowel+semivowel.

2.3.2 The distribution of consonants in Kayardild

This section sets out the facts of the distributional restrictions on consonants in Kayardild that hold at the level of the segment and the word, in the form of lists of permissible clusters. Discussion and explanation will follow in subsections below. For the restrictions on consonants within individual morphs, see Ch.3, §§3.3.1;3.4.1.

In word internal, intervocalic position any consonant is permitted. In word initial position, apical alveolars are not found, nor is /n̪/.

(2.38) Single consonants, intervocalically and word initially

Intervocalic	ʈ	t	t̪	c	k	p	ɳ	n	n̪	ɲ	ŋ	m	ɻ	l	r	j	w
Word initial	ʈ		t̪	c	k	p	ɳ			ɲ	ŋ	m	ɻ			j	w

Perhaps the most informative way to quickly present the patterns apparent in clusters is to distinguish primarily between those which begin with a [+Api(cal) +Dor(sal)] segment versus those that do not. The forty-five permissible clusters that begin with a [+Api +Dor] consonant are set out in (2.39) together with a synopsis.

(2.39) Clusters beginning with a [+Api +Dor] consonant

Nasal	+plosive	ɳt	ɳt̪	ɳc	ɳk	ɳp
Liquid	+plosive	ɻt lt	ɻt̪ lt̪ rt̪	ɻc lc rc	ɻk lk rk	ɻm lm rm
Liquid	+semivowel			ɻj lj rj		ɻw lw rw
Nasal	+nasal			ɳɲ	ɳŋ	ɳm
Liquid	+nasal	ɻn ln rn		ɻɲ lɲ rɲ	ɻŋ lŋ rŋ	ɻm lm rm
Liquid	+nasal +plosive				lŋk rŋk[53]	ɻmp lmp rmp

Synopsis of clusters beginning with a [+Api +Dor] consonant

Apicals neutralise cluster non-initially to a single place of articualtion, analysed here as apical alveolar. Given this,

1. Kayardild permits:
   a. all nasal+plosive clusters
   b. all liquid+plosive clusters
   c. all liquid+semivowel clusters
2. Given that geminates are not permitted, Kayardild permits:
   a. all nasal+nasal clusters, bar those ending in /n̪/[54]
   b. all liquid+nasal clusters, bar those ending in /n̪/[54]
3. Kayardild permits:
   a. all clusters of a liquid followed by peripheral, homorganic nasal+plosive

[53] The cluster /ɻŋk/ is not attested but can be regarded an accidental gap. None of the triconsonantal clusters are very common.

[54] Given there rarity of /n̪/ outside of /n̪t̪/ clusters, the lack of nasal+nasal and liquid+nasal clusters ending in /n̪/ could be interpreted simply as an accidental gap. However, the adoption of Lardil /t̪uln̪u~t̪uɻt̪u / into Kayardild as /t̪uɻɲu/, with a laminal palatal nasal, suggests otherwise: that clusters ending in /n̪/ are ill formed.

The twelve other permissible clusters are shown in (2.40):

(2.40) Clusters that do not begin with a [+Api +Dor] consonant

Homorganic	Nasal	+plosive	nt	n̪t̪	ɲc	ŋk	mp
Heterorganic	n	+plosive				nk	np
	n	+nasal				nŋ	nm
	c	+plosive					cp
	ɳ	+plosive					ɲp
	ɳ	+nasal					ɲm

Synopsis of clusters that do not begin with a [+Api +Dor] consonant

Laminals neutralise cluster initially to a single place of articulation, indicated here as palatal.[55]

1. Kayardild *does not permit*:
   a. any clusters beginning with an apical plosive
   b. any laminal+velar clusters
   c. any heterorganic coronal clusters
   d. any heterorganic peripheral clusters
2. *But taking this into account*, and given the neutralisation of cluster initial laminals, Kayardild permits:
   a. all plosive+plosive clusters
   b. all nasal+plosive clusters
   c. all nasal+nasal clusters

2.3.3 Characterising consonant distributions

The following sections characterise the observations above from several points of view. Prominent proposals in the recent literature which attempt to explain cross-linguistic

[55] As mentioned §2.1.2.1 the single laminal plosive and laminal nasal found in coda position are articulated in a somewhat more advanced position than /c, ɳ/ and a more retracted position than /t̪, n̪/. Here I follow recent Australianist practice and represent the neutralised segments as laminal palatals. It should be acknowledged though, that the choice of representation is somewhat arbitrary (on this point see also Butcher 1995).

tendencies in consonant phonototactics are introduced and weighed against the empirical facts of Kayardild.

2.3.3.1 The failure of prosodic licensing

In many languages, the phonotactics of consonants can be understood in terms of relationships between consonantal segments and prosodic constituency, most notably syllable structure. The notion of **prosodic licensing** states that prosodically defined positions such as onset and coda permit — or license — only certain features, segments or clusters, and that the range of consonant clusters found in the language ought to follow from these licensing conditions, given the additional fact that clusters can only be comprised of an onset, or a coda, or a coda followed by an onset (Kahn 1976[1980]).

In Kayardild as in most Australian languages though (Dixon 1980:159), this kind of prosodic licensing generates distinctly poor predictions of what clusters will be attested. Except under trivial analyses in which all consonants are placed either in the onset or in the coda, what we find is that the set of permissible clusters is dramatically smaller than predicted by prosodic licensing.[56] To take an example, the cluster /lmp/ is well formed in Kayardild, and could be syllabified in a non-trivial fashion either as /lm.p/ or /l.mp/. Assuming the first syllabification we obtain an onset /p/ which, consistent with the

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[56] To be precise, if /CCC/ is syllabified /CC.C/ then there are 17 possible onsets and 15 codas, yielding an expected 17×15=255 clusters, against which the attested 67 represent just 26%, i.e., just over one quarter. If /CCC/ is syllabified /C.CC/ then there are 19 possible onsets and 10 codas, yielding an expected 19×10=190 clusters, against which the attested 67 represent just 35%, i.e., just over one third.

predictions of prosodic licensing, is widely attested in other clusters, however the coda /lm/ which precedes onset /p/ is not found anywhere else. Likewise, under the second syllabification we obtain a widely attested coda /l/, but the onset /mp/ occurs elsewhere only after /ɻ/ and /r/.

Setting aside its failure to predict coda+onset clusters in Kayardild, one could argue that prosodic licensing does make some correct predictions regarding just codas. In many languages, codas evidently are unable to licence the same range of features, or same range of contrasts, that are found in onsets (Itô 1986[1988]; Itô 1989; Goldsmith 1990), and at first glance the same appears to be true of Kayardild. Let us assume that clusters are syllabified into a coda which may be complex, and a simple onset (e.g., as /lm.p/). In that case, it is true in Kayardild that any consonant can occur in an onset but neither the semivowels /j, w/ nor five of the six plosives /ʈ, t, t̪, k, p/ can appear in a coda; any manner of articulation can appear in an onset but only plosives, nasals and liquids appear in codas. Notwithstanding the veracity of these observations, on closer inspection the most significant contrast in Kayardild is not between onsets and codas, but between *intervocalic* onsets and all other consonant positions.

In Kayardild as in most Australian languages (Dixon 1980:159; Hamilton 1996:77–78), intervocalic onsets license all consonants. On the other hand, onsets preceded by a consonant exhibit a phonotactic behaviour more akin to that of codas: they are unable to contain certain manners of articulation (namely liquids), and nor can they licence place of articulation independently of what appears in the preceding coda.

What matters for Kayardild consonant phonotactics is not a consonant's prosodic position, but its adjacency to other consonants and to vowels. In the remainder of this dissertation, that fact will be granted a significant place in the analysis of Kayardild phonology.

2.3.3.2 Adjacency based characterisations

An alternative to prosodic licensing is the view that consonant cluster phonotactics derive from matters related to the adjacency of a segment to its neighbours. An adjacency based approach to cluster phonotactics will work well in Kayardild, as we will see below. By the same token, one of the proposed *explanations* for why adjacency matters across languages — the hypothesis known as licensing by cue — does not fare well against the Kayardild data.

2.3.3.3 The failure of licensing by cue

One proposed explanation for why adjacency rather than prosodic constituency is important for phonotactics is Steriade's (1999a; 2001) **licensing by cue** hypothesis. Licensing by cue states that patterns in the observed orderings of adjacent segments will, all else equal, proceed from facts pertaining to acoustic phonetics and perception. As an uncontroversial starting point, we observe that in a string of segments *abc*, it is often the case that the acoustic, perceptual cues to the identity of *b* are found not only in *b* but also in *a* and *c*. Moreover, other strings will exist such as *abd* in which the cues to the identity of *b* found in *c* are absent or weaker in *d*. Supposing that ease of perception plays a pivotal role in phonological systems, it ought then to be the case that *bc* is preferred over, and more commonly attested than *bd*. Moreover, since the basis of the preference is acoustic and perceptual, the preferences themselves ought to be universal.

A significant application of the licensing by cue approach, to Australian languages is Hamilton (1996). Hamilton frames his ‘articulator scale’ (cf §2.3.1) in terms of a set of perceptual cues to the places of articulation found in Australian languages.[57] The cues of importance are those found in vowels which appear before a consonant of each place of articulation, and in vowels which appear after it. Hamilton then assumes that the relative strength of those cues support empirical observations regarding places of articulation and consonant clusters in Australian languages. That is, if place of articulation *a* is more likely to appear directly before (or after) a vowel than place of articulation *b*, this is because the perceptual cues to *a* are stronger than the perceptual cues to *b* in vowels that follow (or precede) them. Since Hamilton’s assumptions are not based on any empirical research however (Hamilton 1996:116–17), it is prudent to question whether they are justified.

At least one of Hamilton’s assumptions is undoubtedly secure, namely that perceptual cues to retroflexion are strong in a preceding vowel and weak in a following vowel. There is broad agreement regarding this fact, and it correlates directly with the widely observed, cross-linguistic preference for retroflexes to appear at the start of heterorganic clusters but not at the end of them (Bhat 1974; Steriade 2001; Hamann 2003).

Other than the case of retroflexes though, it is not at all clear that the facts of Australian language phonotactics actually can be explained by licensing by cue. At an

[57] Licensing by cue is not the only factor adduced by Hamilton (1996) to account for Australian language phonotactics, but it is the sole factor invoked to explain sequencing of places of articulation.

intuitive level, it is not obvious that in the vowel following a plosive, the cues to laminal /c/ (with its long, loud release burst) should be weaker than those for /p/ (with a less noisy, weaker burst), yet this is required if Australian phonotactics are to follow from licensing by cue.[58] Furthermore, there are problems for Hamilton's assumptions at an empirical and logical level. If licensing by cue is universal in its effects (which it ought to be according to its premises), and Australian languages prefer, say, *ab* over *ba* then we should not find other languages which, on the basis of licensing by cue, prefer *ba* over *ab*, but contradictions of this type can be found. A case in point relates to apical+peripheral clusters. In Australian languages these are strongly preferred over peripheral+apical clusters, yet Jun (2004) shows that precisely the opposite preference is well attested cross-linguistically outside of Australia, appearing in languages such as Korean (Jun 1996), Latin (Sen 2008), and in English post-lexical cluster reduction (Nolan 1992). Moreover, empirical tests (Jun 1996) have shown that the relative strengths of perceptual cues do favour the Korean/Latin/English preference pattern over the Australian.

In sum, licensing by cue will not provide a general explanation for the phonotactic patterns encountered in Australian languages. In the following, I discuss and characterise the patterns that are found, but I will not endeavour to locate an 'explanation' for them in the same fashion that Hamilton (1996) attempts with licensing by cue.

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[58] Given that /p/ occurs more often at the end of a cluster than /c/, cf §2.3.1.

2.3.3.4 Sequencing of place of articulation

There are five key observations to be made regarding the sequencing of place of articulation in Kayardild.

Dorsal–apicals only occur cluster initially (recall that the dorsal–apicals, specified as [+Api +Dor], are liquids and retroflexes). This rules out sequences such as */pl/ (peripheral + dorsal–apical), */lɳ/ (dorsal–apical + dorsal–apical), and */cr/ (laminal + dorsal–apical).

Adjacent, non-dorsal coronals must be homorganic. This rules out heterorganic sequences such as */n̪c/ (non-dorsal laminal + non-dorsal laminal), and */nc/ (non-dorsal apical + non-dorsal laminal), but permits /rc/ (dorsal apical + non-dorsal laminal) and /ɻt/ (dorsal apical + non-dorsal apical).

All permissible apical+laminal clusters (such as /lt̪/), and all impermissible ones (such as /nt̪/), are fully accounted for by the two principles just stated above; there is no need to redundantly state that apicals are ordered before laminals.

Adjacent peripheral consonants must be homorganic. This rules out heterorganic sequences such as */ŋp/.

The sequence peripheral+coronal is ill formed. This is typical for Australian languages and rules out heterorganic sequences such as */ŋc/.

The sequence laminal+velar is ill formed. This restriction is not especially common throughout Australia, but results from a sound change reconstructable to pre-proto Tangkic (Round in prep.-a).

2.3.3.5 *Sequencing of manner of articulation*

Sequencing of manner of articulation in Kayardild follows typical Australian patterns. Liquids in a cluster can only appear initially; semivowels in a cluster can only appear finally, and only after liquids. Nasals must precede any plosives. These patterns are examined next with respect to sonority.

2.3.3.6 *The partial failure of sonority sequencing*

The manners of articulation of Kayardild consonants can be ranked according to their sonority as in (2.41).

(2.41) Sonority ranking of manners of articulation, from highest to lowest (after e.g. Clements 1990; Ladefoged 1993:246)
Semivowel > Liquid > Nasal > Plosive

The sequencing of consonants in terms of sonority has been applied to syllable-based accounts of cluster phonotactics in proposals such as Murray & Vennemann's Syllable Cut Law (1983) and Clements' Sonority Sequencing Generalisation (1990). In Kayardild, sonority sequencing can be viewed in terms of segment adjacency rather than prosodic or syllabic position as follows: generally, the consonants in a Kayardild cluster are arranged in a strictly non-increasing order of sonority — that is, sonority either decreases from left to right, as in liquid+nasal+plosive clusters, or it remains the same as in nasal+nasal or plosive+plosive clusters.

As in most Australian languages though (Hamilton 1996:182), semivowels in Kayardild buck this general, sonority-based trend. Semivowels cannot precede any other manner of articulation despite that fact that if they did so they would create a cluster with decreasing sonority, and they do follow liquids despite the fact that in doing so they create a cluster with an increasing sonority profile. In §2.3.4 I propose that Kayardild phonotactics are sensitive to sonority only at levels where plosives contrast against nasals, and nasals against all others, but not at levels where liquids contrast against semivowels; the ordering restrictions on semivowels are due to constraints which refer directly to semivowels as a manner classs, and not to their sonority.

2.3.4 Formalising phonotactic generalisations

This section offers a formal account of static consonant phonotactics in Kayardild.

The most extensive, formal account of the general facts of Australian language phonotactics is Hamilton (1996). Beyond his valuable cataloguing and summary of empirical data, Hamilton's primary theoretical interest is to build a cross-linguistically valid hierarchy of markedness of consonant clusters in Australian languages. Translated into Optimality Theoretic terms,[59] Hamilton seeks to build something like a default

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[59] Hamilton's dissertation appeared around the same time as the first works in Optimality Theory. Although it shares many of the notational devices which have since become standard within OT, the dissertation is not couched in Optimality Theory of any kind, and its formalisms do not equate directly into those of OT. Hamilton for example formulates *constraints on constraints* — typically phonetic constraints on string-based markedness constraints — in order to derive his markedness hierarchy. The hierarchy itself is then regarded as system of *default* relationships which can be overridden in individual languages (for example by diachronic factors, Hamilton 1996:30–31) and not a system of *innate, universal* relationships of the type central to contemporary OT. In this sense

ranking of markedness constraints on clusters, such as || *pk » *ck » *tk ||. Unlike Hamilton (1996), I do not aim to account for cross-linguistic tendencies here.[60] The aim is rather for the constraint-based grammar to describe Kayardild on its own terms.

Another recent, formal treatment of phonotactics in an Australian language is Baker (2008), an OT account of the phonology of Ngalakgan (Gunwinyguan, non-Pama Nyungan). As one would expect for a language of Australia, many of the phonotactic generalisations in Ngalakgan are adjacency based. Since the account of Ngalakgan is framed within mainstream Optimality Theory however, the existence of universal constraints and universal constraint rankings are assumed, which will not be assumed in the analysis of Kayardild.[61] One central concern in the analysis of Ngalakgan is the syllabification of geminate plosives and homorganic nasal+plosive clusters as onsets, for which crucial evidence comes from stress patterns that are sensitive to syllable weight — in Ngalakgan, coda consonants contribute to syllable weight. Since Kayardild possesses neither geminates nor contrastive syllable weight, the formalisms proposed by Baker

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Hamilton's formalisms are aimed at giving expression to a Praguean notion of markedness more so than to a contemporary OT notion.

[60] See Ch.1 §1.6.3 regarding the view taken in this dissertation on the relationship between language-specific and typological facts.

[61] Baker employs modified versions of Hamilton's (1996) constraints together with constraint types proposed by Steriade (2001) that play an important role in driving phonological alternations. Baker does not explicitly comment on the incompatibility of Hamilton's non-OT assumptions with his own, contemporary Optimality Theoretic ones (cf fn.59), nor are any objections raised to the plausibility of Hamilton's licensing by cue approach to Australian language phonotactics, which is incorporated into the analysis of Ngalakgan.

specifically to account for the interaction between phonotactics and syllabification in Ngalakgan are not applicable to the analysis of Kayardild.

This section on Kayardild consonant phonotactics employs a minimal formal toolkit, using nothing more than undominated constraints — i.e., those which are adhered to without exception — and no reliance is placed on assumed universals.

2.3.4.1 Constraints on place of articulation sequences

Constraints on the sequencing of place of articulation in clusters are shown in (2.42)–(2.47). These take the form of explicit bans on certain sequences, of the type **ab*, and constraints from the widely used AGREE family (Lombardi 1999) which state that adjacent consonants that match some criterion must share certain features. Both of these constraint types refer to conditions that hold on adjacent segments. Constraints of the type **ab* are sensitive to linear order (i.e., **ab* is not equivalent to **ba*), whereas AGREE constraints are non-directional.

(2.42) *[−Cor][+Cor]
A peripheral+coronal consonant sequence is ill formed.

(2.43) $*C{+}C_{[+\text{Api} +\text{Dor}]}$
A consonant sequence *ab* is ill formed if *b* is [+Api +Dor] (i.e., if *b* is a retroflex or liquid).

(2.44) AGREE(Place) /[+Cor, −Dor]
Adjacent, non-dorsal coronals (i.e., non-retroflex, non-liquid coronals) share all place of articulation features.

(2.45) *[+Dent][−Dent]
A consonant sequence *ab* is ill formed if *a* is laminal dental and *b* is not.

(2.46) AGREE(Place) /[−Cor]
Adjacent peripheral consonants share all place of articulation features.

(2.47) AGREE(Place) /[+Cons, +High]
Adjacent high consonants — i.e., laminal palatals and dorsal velars — share all place of articulation features.

Constraint (2.42) requires that coronals precede peripherals. Constraint (2.43) ensures that liquids and retroflexes only occur cluster initially. Constraints (2.43) and (2.44) together ensure that coronal clusters are either homorganic, or are heterorganic and begin with a liquid or retroflex. Constraints (2.42), (2.44) and (2.45) conspire to bar dentals from all heterorganic clusters except when in final position, after a liquid or retroflex. Constraint (2.46) ensures that adjacent peripherals are homorganic. Constraints (2.47) and (2.45) conspire to bar all laminal+velar clusters.

2.3.4.2 Constraints on manner

Constraints on the sequencing of manner of articulation in biconsonantal clusters are shown in (2.49)–(2.51). These all take the form of bans on specific sequences.

(2.48) *[–Son][+Son]
A sequence of a plosive followed by nasal, liquid or semivowel is ill formed.

(2.49) *[–Cont][+Cont]
A sequence of nasal or plosive followed by liquid or semivowel is ill formed.

(2.50) *Semivowel+C
A semivowel+consonant sequence is ill formed.

(2.51) *GEM
Geminates are ill formed.

Constraints (2.48) and (2.49) capitalise on the features [±Son] and [±Cont], both of which quantise the sonority scale, to rule out sequences of increasing sonority at the lower end of the scale. Constraint (2.50), together with (2.49) and (2.48), rules out unattested sequences involving semivowels. Geminates are ruled out by (2.51). Clusters with non-initial liquids were ruled out by (2.43) above.

Constraints which limit triconsonantal sequences to those comprised of a liquid followed by a peripheral nasal+plosive cluster are shown in (2.52)–(2.54).

(2.52) $*C(CC)_{[\alpha Son]}$
A triconsonantal sequence must not end in a sonorancy plateau.

(2.53) $*(CC)_{[\alpha Cont]}C$
A triconsonantal sequence must not begin with a contiunancy plateau.

(2.54) $*(CC)_{[\alpha Cor]}C$
A triconsonantal sequence must not begin with two coronals or two peripherals.

Constraints (2.52) and (2.53), in combination with the biconsonantal sonority constraints (2.49) and (2.48) ensure that triconsonantal sequences must monotonically decrease in sonority (from left to right), and since clusters cannot begin with a semivowel due to (2.50), triconsonantal sequences can only consist of liquid+nasal+plosive. Moreover, since all CCC clusters must begin with a liquid and since all liquids are coronal, all CCC clusters will begin with a coronal. Constraint (2.54) rules out any CCC clusters beginning with two coronals, as in */lnt/ or */lnp/, and so all CCC clusters will have to begin with a coronal+peripheral. Finally, since peripherals can only be followed by homorganic peripherals due to (2.42) and (2.44) above, all CCC clusters will consists either of liquid+/ŋk/ or of liquid+/mp/.

2.3.4.3 Constraints enforcing idiosyncratic restrictions

The idiosyncratic constraints (2.55)–(2.56) enforce the equally idiosyncratic bans in Kayardild on [rt] sequences[62] and on cluster final /n̪/.

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[62] Presumably one could motivate this constraint in some non-trivial manner, particularly with careful reference to cross-linguistic evidence; indeed, Hamilton (1996:99–100) remarks that gaps involving homorganic liquid+plosive clusters are not infrequent in

(2.55) *rt
The sequence [rt] is ill formed.

(2.56) *Cn̺
A sequence of consonant+[n̺] is ill formed.

2.4 Differences in segmental analyses *vis-a-vis* Evans (1995a)

For the most part, the surface segmental representations of Kayardild words are the same in this dissertation as in Evans (1995a). This section recaps and lists the few cases in which representations deviate.

2.4.1 Systematic differences

Systematic differences mentioned previously between Evans' (1995a) representations and the representations used in this dissertation are summarised in (2.57).

Australian languages. Nevertheless, given the assumptions expressed in Ch.1 §1.6.3, it is doubtful that Kayardild speakers learn this constraint as anything other than a direct stipulation.

(2.57)		Evans(1995a)	Here	cf. §
	Vowel hiatus	Not permitted.	Permitted.	§2.2.2
	Word final short /i/ and /u/	Common, because stems ending in /i/ or /u/ can surface as words.	Rare because stems ending in /i/ or /u/ must be followed by the termination /-a/.	§2.2.1.2
	Stem/word final long /uu/	Not distinguished from /u/.	Distinguished from /u/.	§2.2.1.4
	Retroflex clusters	Represented e.g. as /ɳʈ̣/, /ɻʈ̣/.	Represented e.g. as /ɳʈ/, /ɻʈ/.	§2.1.2.1

2.4.2 Miscellaneous, specific differences

Differences which pertain to more specific segmental strings, and to individual morphs are listed and described in (2.58a–g).

(2.58)		Form	Comment
	a.	Clusters /ɲŋ/	Evans (1995a:70,72,220) refers to surface /ɲŋ/ clusters, derived from underlying /c+ŋ/ or /t̪+ŋ/ across morph boundaries, which undergo post-lexical simplification to /ɲ/. My observation is that /ɲŋ/ clusters are not produced by senior speakers of Kayardild.[63] Younger speakers, whose variety is not the object of study in this dissertation, do produce /ɲŋ/ clusters.
	b.	Clusters /rt/	Evans (1995a:69,70) refers to a cluster /rt/ in *dakarrdinya* /ʈakartiɲa/ 'fish sp.' I have observed younger speakers produce /rt/ clusters but the phonology of older speakers systematically avoids them.[64]

[63] Specifically, Dawn Naranatjil, Pat Gabori, Sally Gabori, Alison Dundaman are recorded uttering /ɲ/ rather than /ɲŋ/. To my knowledge, no senior speaker has been recorded using /ɲŋ/.

[64] I was not able to elicit a token of *dakarrdinya* from elder speakers.

(2.58)

	Form	Comment
c.	Formal instrumental /ɳuru/	The instrumental suffix is recorded as /nuru/ by Evans (1995a). This is one possible surface form, but another is /ɳuru/. The distribution of the two is accounted for by underlying /ɳuru/.
d.	/wu/-initial suffixes after liquids	Suffixes beginning in /wu/ are described in Evans (1995a:165,172.ex.4-29) as losing their initial /w/ after a liquid. The analysis here is that the weakening of the /w/ percept is due to coarticulation of liquid+/w/ sequences (cf §2.1.4.4). In support, note that transcriptions of such suffixes in Evans (1995a:292,518.ex12-78) is variable and sometimes includes a *w*.
e.	Collative /kiː-wa-t̪/	The collative CASE suffix (= Evans' *verbal allative*) is transcribed in Evans (1995a) sometimes with short /i/ and sometimes with long /iː/. Here the vowel is analysed as long, though see §2.1.6.3 regarding post-lexical long vowel shortening.
f.	Vowel length in *verbal purposive* /caniː-c/ and formal origin /waːɲ/	The vowels /i/ in the *verbal purposive* suffix and /a/ in the formal origin suffix are described in Evans (1995a:65,175) as being short but lengthened if a low vowel in the following syllable undergoes β-truncation (§2.2.1.3). Nevertheless, many example sentences in Evans (1995a, e.g.157.ex.4-85, 176.ex.4-147) contain counterexamples to this prosodic analysis and I do not find support for it in my corpus. The vowels in question are analysed here as (i) long in fORIG, (ii) belonging to two distinct suffixes corresponding to Evans' *verbal purposive:* a short /i/ appears in the 'human allative CASE', and a long /iː/ in the 'collative CASE' (see further Ch.6, §6.1).

(2.58)		Form	Comment
	g.	Middle form of verb stems ending in /u, uː/	Corresponding to active verb stems ending in /u, uː/, Evans (1995a:277) analyses middle stems as ending in *uyii*, i.e., /uiː/, and undergoing optional reduction to /iː/. Here, the same middle forms are analysed as ending in *iyii*, i.e., /iiː/ — this follows from the observations (i) that in all of my recorded tokens of such middle verbs, the vowel sequence sounds like [ɪɪː], not [ʊɪː]; and (ii) that in other forms such as *wanku-yii-wa-th-* 'shark-fLLOC-fINCH-TH', one usually hears a distinctly different [ʊɪː] sequence.

3 Word structure

This chapter surveys the structure of Kayardild word forms. The purpose is to introduce the various morphological components of Kayardild words, the structures they enter into, and at a broad brush level, the ways in which those structures pattern with classes of phonological modifications which will be the focus of Ch.4. For the most part the chapter will be concerned with **lexical stems**, that is, the part of a Kayardild word which appears before inflectional suffixes (inflection is dealt with in Chs.6–7). The chapter is organised as follows. After a brief orientation in §3.1, §3.2 discusses lexical entries. Stems comprised of roots are discussed in §§3.3–3.5, and attention then turns to suffixes in §3.6, the 'termination' T in §3.7, morphs obscured by phonological modifications in §3.8, personal pronominal stems in §3.9, compass locational stems in §3.10 and phonological clitics in §3.11. A collection of issues relating to roots, stems and suffixes is addressed in §§3.12–3.14, and song forms are discussed in §3.15. A lexicon of suffixes is provided in §3.16.

3.1 Orientation

We begin with a short introduction to the kinds of morphological pieces assumed to comprise Kayardild words (§3.1.1), and with an outline of the approach to be taken to the analysis of identity and alternation in the surface forms of those pieces (§3.1.2).

3.1.1 The basic components of words

Syntactic words in Kayardild will be analysed as comprised of a lexical stem, followed possibly by inflectional suffixes, and ending with the termination, T.

Lexical stems are comprised of **roots**, **suffixes** and **thematic** elements (more on which below), and each lexical stem falls into one of two morphological classes — following Evans (1995a) and standard Australianist practice, these are labelled **nominal** and **verbal**.[1] On the analysis presented here, Kayardild has no prefixes.

Roots also fall into one of two classes: nominal, and verbal. A lexical stem which is nominal will be comprised minimally of a single nominal root. A lexical stem which is verbal is comprised minimally of a verbal root plus a thematic.

A small class of phonological enclitics act like suffixes which attach not to stems but to complete syntactic words.

[1] On the relationship between morphological class and syntactic function, see Ch.6, esp. §6.4.8.

3.1.2 Approach to identity and alternation in forms

As in any language, a given morph in Kayardild will not always appear with the same surface form. The range of formal variants which a morph exhibits will be analysed in terms of two basic notions. First, morphs possess an underlying phonological form. In a small number of cases, sets will be posited of paradigmatically opposed morphs — allomorphs — with different allomorphs appearing in different contexts. Allomorphy is posited in cases where it is not possible to account for the range of surface forms completely in terms of alternations which (i) repeat across multiple items in the lexicon, and (ii) can be convincingly analysed as being phonological in nature, given what else is known about the phonology of Kayardild, and of natural languages generally. Second, it is assumed that classes of phonological modifications apply to underlying phonological forms. These modifications, together with underlying forms, will account for regular, systematic points of identity and alternation in surface forms.

Importantly, it is assumed that phonological modifications are generally sensitive not just to phonological form, but to morphological information. As a consequence, they apply to appropriate phonological forms only in certain morphological contexts. Together with underlying forms, such modifications will account for morphologically restricted alternations in surface forms. The motivations for pursuing this mode of analysis are as follows.

The intention in invoking morphologically sensitive phonology is to take seriously the task of analysing sub-regularities in the sound system of Kayardild, sub-regularities which surely form part of the linguistic knowledge of a speaker. By analysing such regularities in terms of phonological modifications, it will be possible (i) to relate them explicitly to other aspects of Kayardild phonology — whether restricted or fully regular — thereby increasing the informativeness and degree of integration of the overall analysis; and (ii) to afford them an analysis similar to what they would receive if they were fully regular, thus for instance capturing similarities between modifications which may be restricted in Kayardild but generally applicable in other languages. Furthermore, and as a methodological tactic, in the process of formally relating phonological sub-regularities to information about morphology, we will be pressed to uncover and articulate the underlying organisation of that information. That organisation can then be related in turn to other aspects of the morphology which will be of interest in the dissertation.

In this chapter, it will suffice to point out where it is that different classes of phonological modifications apply. The task of describing the modifications in comprehensive detail, and of relating them to one another, will be taken up in Ch.4.

3.2 Lexical stems, lexical entries and redundancy rules

Section 1.4 in Ch.1 introduced a range of representational levels in terms of which Kayardild will be analysed. What was not mentioned in §1.4 was the lexicon. This section sets out assumptions regarding lexical representations which will be adopted here, based upon key arguments advanced by Jackendoff (1975), and elaborated by Anderson & Lightfoot (2002). The assumptions declared here should be viewed as setting out a necessary, minimum amount of structure, and are not intended to preclude the possibility that more structure, perhaps much more, also exists.

A typical lexical stem composed solely of a root is represented as in (3.1a), while the factitive stem based on (3.1a) is shown in (3.1b) — the entry for (3.1b) is preliminary only and will be enriched further below.

		a.	b.
(3.1)	Identifier	MULURR	MULULUTH
	Category	n.	v.
	Form	/mulur-/	/mululut̪-/
	Morphs	/mulur-/	/mulur-ɻu-t̪-/
	Morphemes	*mulurr*	‘*mulurr*-fFACT-TH’
	Semantics	‘jealous’	‘make OBJ jealous’

Each stem entry carries its own unique identifier which by convention will be given here as an orthographic transcription of the root’s form, placed in small caps. It next contains an indication of morphological category, a phonological form, and a decomposition of that into individual morphs. A morphomic representation follows, and finally, a semantic representation of the stem is given here as an English gloss. The entry would also include additional syntactic information which for brevity’s sake is not shown here.

In addition to stem entries, it will be assumed that the lexicon contains redundancy rules, which explicitly represent *types of relationships* that recur in the lexicon between stems. For example, a redundancy rule as in (3.2) represents the well-instantiated relationship that occurs between bases and corresponding factitive stems:

(3.2) Redundancy Rule (RR) #1

Identifier	*i*		*j*
Category	n.		v.
Form	/*x*/	↔	*as derived from morphs:*
Morphs	/*y*/		/*y*-ɻu-t̪-/
Morphomic	*z*		‘*z*-fFACT-TH’
Semantics	‘property *p*’		‘make OBJ have property *p*’

This also enables us to represent the stem MULULUTH from (3.1b) somewhat more richly, as in (3.3).

(3.3)

Identifier	MULULUTH
Category	v.
Form	/mululut̪-/
Morphs	/mulur-ɻu-t̪-/
Morphomic	‘ROOT-fFACT-TH’
Semantics	‘make OBJ jealous’
Related	to MULURR, by RR #1

The reference in the final line of (3.3) to redundancy rule (RR) #1 and to the lexical entry MULURR each give more information about MULULUTH than is provided in the earlier lines. Reference to RR#1 implies, by virtue of the content of RR#1, that the fFACT morph in MULULUTH is effectively conveying the factitive meaning, and reference to MULURR indicates that the root morph /mulur/ does normally have the meaning ‘jealous’ and in fact can appear as an independent stem meaning such. Lest this seem trivial, let us consider what occurs in a less prototypical situation.

As far as we know, Kayardild contains no stem *DABAL with the form */t̪apal-/ meaning ‘dry’. It does however contain a stem DABALUTH ‘make OBJ dry’ with both a form and a meaning which suspiciously resemble a factitive. Given the structure of lexical entries being assumed here, it is possible to formally represent the linguistic knowledge upon which this latter observation is based, as shown in (3.4).

(3.4)			
	Identifier	DABALUTH	
	Category	V.	
	Form	/ʈapalut̪-/	
	Morphs	/ʈapal-ɻu-t̪-/	
	Morphomic	‘ROOT$_{NL}$-fFACT-TH’	
	Semantics	‘make OBJ dry’	
			/ʈapal/
	Related	by RR #1 to:	/ʈapal/
			ROOT$_{NL}$
			‘dry$_{NL}$’

The ‘related’ line of entry (3.4) relates the form and meaning of DABALUTH explicitly to other factitives via reference to RR#1. It expresses both the absence of a lexical entry for *DABAL, and the fact that DABALUTH appears as if it were based on *DABAL, through the listing of information about it. The information listed about *DABAL is necessary if the reference to #RR1 is to be interpretable, and at the same time captures the tacit analysis which stands behind the ‘suspicious resemblance’ observed between DABALUTH and other factitives. In this dissertation ‘pseudo-stems’ like *DABAL will be termed **non-lexical**, following Jackendoff (1975), and will be given a subscript $_{NL}$ wherever they appear. Non-lexical stems do not possess a lexical entry of their own, and hence do not turn up independently in words, yet they nevertheless do possess a representation somewhere the lexicon: inside the entry of another stem.[2]

3.3 Stems of nominal roots only

This section examines stems composed solely of one or more nominal roots. Restrictions on possible root shapes, i.e., morph structure conditions, are covered in §3.3.1, compounds in §3.3.2 and stems involving reduplication in §3.3.3. The identification of non-lexical nominal roots is discussed in §3.3.4.

3.3.1 Morph structure conditions on nominal roots

All nominal roots begin with a consonant, are minimally CV in length, and may end in a short vowel[3] or a consonant. Roots ending in a consonant may end in any of the single consonants or consonant clusters listed in (3.5).

(3.5) Attested final consonants and clusters in nominal roots

ɻ	l	r	ɳ	n	ɲ	ŋ	t̪	c	k	lŋ	rŋ	ɻk	lk	rk

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[2] Non-lexical roots and stems can appear inside multiple other entries. For example, *DABAL also appears in DABALDABAL, a stem with the form /t̪apaltapal/, which means ‘dry season’ and whose entry would include reference to a redundancy rule related to reduplication, such as RR#2 in (3.13) below. On the appearance of non-lexical stems inside multiple other entries, and the (benign) implications of this for the kind of model of the lexicon assumed here, see further Jackendoff (1975).

[3] On allomorphy in /Ca/ and /Cu/ roots see §3.12.1.

Given that roots never end in labials, permissible final consonants and clusters can be summarised as: (i) any liquid; (ii) any nasal except /n̪/ (on which see also Ch.2, §2.2.4); (iii) any non-apical plosive; (iv) any liquid plus velar.[4]

Most nominal roots, once syllabified, are two syllables long; the longest attested is five syllables in length (though see also §3.3.4 regarding contestable cases), and the longest consonant-final roots are three syllables long. Examples of roots ending in each vowel and each consonant or cluster can be found in table (2.22) on p.76; examples of roots with different syllable counts can be found in (5.15)–(5.18) on pp.332ff.

Kayardild has no prefixes, and thus a nominal root in a simple stem will stand at the beginning of its word. In Ch.2 §2.1.6.5 it was mentioned that words beginning with /wu/, /ji/ and /ja/ can be realised phonetically without the initial semivowel, moreover, that words borrowed from English into Kayardild are typically nativised with an excrescent /w/ before initial /u/ and /j/ before initial /i/ and /a/. One may ask, then, whether there is any evidence that these words — and their word initial nominal roots — actually begin underlyingly with a semivowel, or whether a vowel initial representation is better motivated. The best evidence can be gained from examining the roots in question in word *non*-initial position, i.e., in contexts where a root initial semivowel should clearly be evident if it is part of the root's underlyingly form. In all cases where such conditions are met, the roots in question do clearly begin with a semivowel. For example, in (3.6a),

[4] Roots ending in liquid+/ŋ/ are rare — there is only one confirmed root ending in /lŋ/ and one in /rŋ/ — and so the absence from the lexicon of roots ending in /ɻŋ/ can be regarded as an accidental gap.

the initial /w/ of the second copy of /wumpu/ undergoes regular, progressive nasalisation; if the underlying root were /umpu/, the nasal /m/ would be unexpected. Likewise in (3.6b) the initial /j/ of /jakuɻi/ surfaces after /l/; if the underlying root were /akuɻi/ this would be unexpected. All available evidence favours the analysis in which *all* nominal roots are consonant initial.

(3.6)	a.	*wumbu-wuthin-**m**umbu-wuthin-da* wumpuwut̪inmumpuwut̪inta wumpu-wut̪iɲ-wumpu-wut̪iɲ-ta ‹trunk-fPLENTY-trunk-fPLENTY›-T ‹tangle of roots›-Ø	b.	*nal-**y**akuri-a* ŋaljakuɻia ŋal-jakuɻi-a ‹head-fish›-T ‹bird sp.›-Ø

Regarding interlinear glosses: in cases where two lines of phonological representations are shown, the higher line indicates surface structure and the lower line underlying structure. Where consecutive lines of glosses contain portions in angled brackets, ‹ ›, the upper line gives a morph-by-morph gloss and the lower line indicates the composite function of the bracketed elements. Meaningless formal elements are glossed semantically as ‘ø’.

3.3.2 Stems of compounded nominal roots, and their internal phonology

Aside from non-lexical roots, any nominal root can function on its own as a stem. In addition, many Kayardild stems are comprised solely of multiple nominal roots (either lexical or non-lexical). Compounds comprised solely of two nominal roots are common; compounds containing more than two are rare.

As we will see throughout this chapter, it is common for phonological modifications to apply so as to alter the edges of concatenated morphs. For expository purposes, it will be useful to give labels to the various classes of modifications that will be encountered. When nominal roots are concatenated in a compound stem, they typically undergo a class of modifications which will be termed the ‘regular phonology’ — so called because it is the most widely attested set in the lexicon, and one which can be considered the ‘default’ in Kayardild.[5] Key, identifying characteristics of the ‘regular phonology’ are that in the concatenation of two morphs m_1+m_2, (i) the initial consonant of m_2 always survives (possibly with some modification) at the surface; and (ii) a final velar consonant will be entirely deleted from a polysyllabic m_1 morph. Examples are shown in (3.7). Note the deletion of /ŋ/ in (3.7a) and the surfacing of the initial consonant of the second root in every stem.

(3.7)						
	a.	*kurndu-birdi-* kuɳʈupiʈi- kuɳʈuŋ-piʈi- ‹chest-bad-› ‹suffering a bad chest›	b.	*dul-bardu-* ʈulpaʈu- ʈulk-paʈu- ‹ground-hard-› ‹hard ground›	c.	*marral-kunya-* maralkuɳa- maral-kuɳa- ‹ear-small-› ‹small-eared›
	d.	*ngumu-jungarra-* ŋumucuŋara- ŋumu-cuŋara- ‹black-big-› ‹pitch black›	e.	*nal-yakuri-* ɳaljakuɻi- ɳal-jakuɻi- ‹head-fish-› ‹bird sp.›	f.	*minyi-ngarnala-* miɳiŋaɳala- miɳi-ŋaɳala- ‹form-white cockatoo-› ‹termite›

[5] One compound undergoes modifications not from the ‘regular phonology’ but from the ‘leniting phonology’ (on which, see §3.6.3 below). *Jarurndurn-* /caɻuɳʈuɳ/ ‘long legged wasp sp.’ is built on /ca/ ‘foot; leg’ and /ʈuɳ-ʈuɳ/ ‘big’. On the correspondence between /ʈ/ and /ɻ/ in this case, see Ch.4, §4.2.1.3.

On the stressing of compound stems see Ch.5, §5.3.6; and on the meanings and functions of nominal compounding see Evans (1995a:197–200).

3.3.3 Stems of reduplicated nominal roots, and their internal phonology

This section describes stems comprised of a repeated nominal root. For reduplication of polymorphemic units, see §3.12.1 below.

As a preliminary note, when reduplication is analysed in this dissertation, it will be assumed that the reduplicated unit is represented twice at the morphological level, and not merely doubled in the phonology. For a recent, extended argument supporting such an approach, and one whose assumptions are broadly compatible with the model of phonology and morphology advanced in this dissertation, see Inkelas & Zoll (2005).

Returning to the empirical facts of Kayardild, when a single nominal root is reduplicated, two complete copies[6] are underlyingly concatenated. The two root morphs then undergo either (i) modifications from the 'regular phonology', just as roots in compounds do, or (ii) modifications from what for the moment can be termed the 'exceptional phonology' (this will be refined in §3.6.3 below when we come to evidence involving suffixes). Key characteristics of the 'exceptional phonology' are, that in the concatenation of two morphs m_1+m_2, (i) the initial consonant of m_2 will be deleted, or

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[6] Evans (1995a:78) writes that 'usually the entire stem is copied, but in the rare case that the reduplicated portion would be more than three syllables it loses a syllable'. In fact, reduplication places no limits on the number of syllables copied (see §3.12.1 for examples). Evans' one supporting example is the problematic stem *thurruburduyuburdu* /t̪uruput̪ujuput̪u/ 'mud-skipper' on which see §3.3.4 below.

lenited from a plosive to a semivowel; and (ii) that a final velar nasal in m_1 may surface (often with a change in place of articulation). Examples of reduplicated nominal stems are shown in (3.8) and (3.9).

(3.8) ‘Regular’ phonology

	a.		b.		c.	
		kandu~kandu-		*bardi~bardi-*		*wanka~wanka-*
		kantu-kantu-		paʈi-paʈi-		wanka-wanka-
		‹blood-blood-›		‹whisker-whisker-›		‹branch-branch-›
		‹red›		‹shell sp.›		‹branches›

(3.9) ‘Exceptional’ phonology

	d.		e.		f.	
		kamarr~amarr-		*bardi~wardi-*		*wambal~ambal-*
		kamar-kamar-		paʈi-paʈi-		wampal-wampal-
		‹stone-stone-›		‹whisker-whisker-›		‹bush-bush-›
		‹gravel›		‹Lardil man›		‹sparse scrub›

The three nominal reduplications listed in (3.10) exhibit inter-speaker variation in terms of which class of modifications they undergo. No other reduplicated forms are known to exhibit this kind of variation.

(3.10)		a.		b.		c.	
	‘Regular’:		*banthal~banthalk-*		*bulu~bulung-*		*jirndi~jirndi*
	‘Exceptional’:		*banthal~wanthalk-*		*bulum~bulung-*		*jirndi~yirndi-*
			pan̪t̪alk-pan̪t̪alk-		puluŋ-puluŋ-		ciɳʈi-ciɳʈi-
			‹weed$_{\text{NL}}$-weed$_{\text{NL}}$-›		‹tree$_{\text{NL}}$-tree$_{\text{NL}}$-›		‹twig-twig-›
			‹water weed sp.›		‹tree sp.›		‹twigs›

Precisely which class of modifications will apply to a given reduplicated nominal root is not predictable from any aspect of the root — neither segmental, nor prosodic, nor semantic (on the latter two points see Ch.5, §5.3.7) — rather, it must be listed in the lexical entry of the reduplicated stem. This notion, of a lexical representation of the choice of phonology which applies to a sequence of morphs, will be formalised in Ch.4. For now, we can suppose that it takes a form, something along the lines shown informally in the lexical entries (3.11)–(3.14).

(3.11)

	a.	b.
Identifier	KANDU	KANDUKANDU
Form	/kantu-/	/kantukantu-/
Morphs	/kantu-/	/kantu+kantu-/ where '+' = 'regular' phonology
Morphomic	*kandu*	*kandu+kandu*
Semantics	'blood'	'red'
Related		to KANDU by RR #2 (below)

(3.12)

	a.	b.
Identifier	KAMARR	KAMARRAMARR
Form	/kamar-/	/kamaramar-/
Morphs	/kamar-/	/kamar+kamar-/ where '+' = 'exceptional' phonology
Morphomic	*kamarr*	*kamarr+kamarr*
Semantics	'stone'	'gravel'
Related		to KAMARR by RR #3 (below)

(3.13) Redundancy Rule (RR)#2 NOMINAL REDUP. WITH 'REGULAR' PHONOLOGY

Identifier	*i*	↔	*j*
Morphs	/*y*/		/*y*+*y*/ where '+' = 'regular' phonology

(3.14) Redundancy Rule (RR)#3 NOMINAL REDUP. WITH 'EXCEPTIONAL' PHONOLOGY

Identifier	*i*	↔	*j*
Morphs	/*y*/		/*y*+*y*/ where '+' = 'exceptional' phonology

For stress in reduplicated stems see Ch.5, §5.3.7; for a discussion of reduplication and non-lexical roots see Ch.5, §5.3.7.3; for the reduplication of polymorphemic units see

§3.12.1; and for the meanings and functions of nominal reduplication see Evans (1995a:200–01).

3.3.4 On the identification of non-lexical nominal roots

Because non-lexical roots do not appear as stems on their own, additional evidence is required in order to justify positing them. In some cases, a non-lexical root appears with a consistent meaning in multiple stems. Examples include /ju/ 'water' (3.15) and /kuna/ 'child' (3.16).

(3.15)	a.	*yu-buu-j-*	b.	*yu-marii--j-*	c.	**yu-*
		ju-puː-c-		ju-maɻu-i-t̪-		ju-
		‹water$_{NL}$-pull›-TH-		‹water$_{NL}$-fDAT-fMID›-TH-		
		'pull through water'		'submerge'		'water'

(3.16)	a.	*kuna-walath-*	b.	*kuna-wuna-*	c.	**kuna-*
		kuna-palat̪-		kuna-kuna-		kuna-
		‹child$_{NL}$-fPL-›		‹child$_{NL}$-child$_{NL}$-›		
		'children'		'child'		'child'

In the case of reduplicated non-lexical roots, there is evidence from stress that the repeated segmental string is not merely accidentally repeated, rather that two roots are involved (on which, see Ch.5, §5.3.7). A small number of cases are more problematic.

The stem *kupulijupulu* /kupulijupulu/[7] 'swamp grass sp.' is lexically stressed on the first and fourth syllable, following the pattern of a compound or reduplicated stem, not a

[7] Also heard as /kupulujupulu/, /kupulupulu/ and /kupulipulu/.

simple stem (which would be stressed on the first and on the fifth, i.e., penultimate, cf Ch.5, §5.3). Here it most likely that the stem reflects a diachronically earlier form */kupuli-upuli/ which has undergone vowel harmony of *i > u (cf Ch.2 §2.2.3.1). The synchronic analysis is less clear. Segmentally speaking, /kupulijupulu/ is not a true, reduplicated stem, yet prosodically speaking it is not a simple stem. All points considered, it seems best to analyse the stem as a compound of two non-lexical roots, /kupuli/ and /jupulu/. The fact that the synchronic analysis has nothing to say about the segmental similarities of the two roots is unproblematic, since the reasons behind those similarities are diachronic.[8]

A more opaque case is presented by *thurruburduyuburdu* /t̪uruput̻ujuput̻u/ 'mud-skipper'. If this heptasyllabic stem is monomorphemic then it is quite exceptional in Kayardild — the next longest nominal root has just five syllables. The stem is analysed by Evans (1995a:78) as a reduplication of non-lexical /t̪uruput̻u/, in which the second copy exhibits both lenition of /t̪/ → /j/ and loss of the second syllable /ru/. My own speculation is that it reflects an earlier compounded reduplication */t̪uru-juput̻u-juput̻u/, which has undergone simplification of *uju > u.[9] I do not have a token of the stem in my corpus,

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[8] I take the position that a full *explanation* of the patterns that exist in a language will typically require some reference to diachrony. The focus here though is narrower, and is trained on sound patterns which exhibit a strictly synchronic coherence. In synchronic terms, *kubulijubulu* is irregular because it falls outside of those patterns. The diachronic angle, not pursued here, explains why it possesses the kind of irregularity it does.

[9] Other changes like *uju > u are reconstructable in the history of Kayardild, whereas loss of *rV, is not reconstructed as a diachronic change anywhere else in the lexicon, nor is 'CV-deletion' found as a synchronic process in Kayardild.

but Evans' analysis of it as reduplicated suggests a lexical stress on the first and fifth syllable. Again, this would be unexpected for a monomorphemic stem, and an appropriate synchronic analysis would be in terms of a compound of two non-lexical roots /t̪urupuʈu/ and /jupuʈu/.

3.4 Stems of verbal roots and thematics only

This section examines stems composed solely of verbal roots and their associated thematics. Morph structure conditions are covered in §3.4.1, compounding in §3.4.2 and reduplication in §3.4.3.

3.4.1 Morph structure conditions on verbal roots, and their associated thematics

Verbal roots begin with a consonant[10] and end with either a short or long vowel. All CV roots end underlyingly in long vowels. Once syllabified, most verbal roots are monosyllabic or disyllabic; the longest known are tetrasyllabic. Examples are shown in (3.17).

[10] Evidence in support of verbal roots beginning in /wu/, /ja/ and /ji/ is parallel to that discussed with respect to nominal roots in §3.3.1.

(3.17)	a. *baa-j-* paːc- paː-c- bite-TH	b. *buru-th-* puɻut̪- puɻu-t̪- gather-TH	c. *warra-j-* warac- wara-c- go-TH
	d. *ngalama-th-* ŋalamat̪- ŋalama-t̪- take-TH	e. *rajurri-j-* ɻacuric- ɻacuri-c- walk around-TH	f. *burukura-th-* puɻukuɻat̪- puɻukuɻa-t̪- scratch-TH

Each verbal root is associated with a thematic element, TH, whose underlyingly phonological form is either /c/ or /t̪/.[11] As will be the case with other suffixes that contain laminal consonants, an underlying palatal is posited where TH surfaces consistently as palatal; an underlying dental is posited where TH alternates between dental and palatal (for examples of this alternation, see the behaviour of TH when preceded by the formal middle fMID, in §3.13.1). The alternation is driven by a requirement that a laminal dental consonant in a suffix not be preceded by a front vowel or by a long vowel at the surface (cf §3.6.3; Ch.4, §4.6). For this analysis to hold water, two *prima facie* counterexamples involving TH must be addressed. The verbal root *thaa-th-* 'return' and the non-lexical verbal root *daa-th-* 'bob$_{NL}$', shown in (3.18) below, are each analysed as containing an underlying vowel sequence /aa/ and not the single, long vowel /aː/.

[11] Phonological arguments in support of this analysis are presented in §3.8.2 below; for the moment, it will be assumed that this is an accurate interpretation of the facts.

(3.18)	a.	*thaa-th-*	b.	*nal-daa-th-*
		t̪aat̪-		ɳaltaat̪-
		t̪aa-t̪-		ɳal-ʈaa-t̪-
		return-TH		head-bob$_{\text{NL}}$-TH

Under an alternative analysis, these roots could be marked somehow as exceptions to the normal restriction on vowel–laminal sequences. However, since there is a precedent in the Kayardild lexicon for identifying sequences of two, adjacent short vowels (*viz.* in the fPROP allomorph /kuu/ and fABL allomorph /naa/, cf Ch.2, §2.2.1.4), and since those other sequences are also followed by laminal dentals in some cases (cf Ch.4, §4.6), it is more appealing to submit *thaa-th-* and *daa-th-* to a parallel analysis, in which a phonological /aa/ sequence is followed, in a phonologically unexceptional way, by a laminal dental.

3.4.2 The verbal compound stem *kabathaath-*

There is just one compound stem comprised of multiple verbal roots, *kabathaath-* /kapat̪aat̪-/ 'go and hunt (and return)', built on /kapa-t̪-/ 'find; hunt' + /t̪aa-t̪-/ 'go and do and return'.

3.4.3 Stems of reduplicated verbal roots

Verbal reduplication is common in Kayardild; on its functions see Evans (1995a:288–89). The behaviour of the thematic, TH, in reduplicated verbal stems is correlated with stem shape, but the patterns are somewhat idiosyncratic. In some cases, there is clear evidence that reduplication follows an underlying template of ROOT-TH-ROOT-TH, while in others it appears that the template is ROOT-ROOT-TH.

Let us denote as *C* the consonant cluster that forms across the boundary '|' in ROOT-(TH)-|-ROOT-TH. Table (3.19) lists clusters *C* according to (i) the initial underlying consonant in ROOT, and (ii) the thematic, /t̪/ or /c/, which would normally surface after ROOT in non-reduplicative contexts.

(3.19) Surface consonants and clusters across the left edge of the second copy of a reduplicated verbal root ('–' = no attestation; on comments see main text below)

Root initial C	ɻ	ɳ	ɲ	ŋ	m	ʈ	t̪	c	k	p	j	w
TH /t̪/	l	–	–	ɲ	–	ʈ	t̪	–	k	p	–	–
comments:	RE			R		*	RE*		R*	*		
TH /c/	l	–	–	ɲ	ɲm	t	–	c	c	cp	j	j
comments:	RE			R	R	RE		R	E	RE	R	R

As we know from the discussion of nominal reduplication above, in the general case underlying clusters at morph edges in Kayardild may undergo modifications from the 'regular phonology' or from the 'exceptional phonology'. In the comment lines of table (3.19) an indication is given for each surface form whether it is compatible with an analysis in terms of (i) the regular phonology, applying to an underlying ROOT-TH-ROOT-TH template (marked as 'R'); (ii) the exceptional phonology, applying to an underlying ROOT-TH-ROOT-TH template (marked as 'E'); or (iii) the regular phonology applying to an underlying ROOT-ROOT-TH template (marked '*'). As can be seen in (3.19), no one analysis will account for all of the data, and in fact, each of the three are needed for at least one cell in the paradigm. On the other hand, an account can be given in terms of the regular phonology plus an appropriate template for all cases except thematic /c/ plus root initial /k/. The analysis adopted here will treat this one irregular case as a true, morphological irregularity. The analysis therefore, will be as shown in (3.20).

(3.20) Analysis adopted for verbal reduplication

Root initial C	Thematic	Template	Phonology
Sonorants	/t̪/ or /c/	ROOT-TH-ROOT-TH	regular
Plosives*	/c/	ROOT-TH-ROOT-TH	regular
Plosives	/t̪/	ROOT-ROOT-TH	regular

*except for /k/, in which case modifications from the 'exceptional' phonology apply

Data which illustrate the patterns summarised above in (3.19) are shown in (3.21). Apparent exceptions are discussed below.

(3.21)

TH	Simple root gloss	Underlying ROOT(-TH)-ROOT-TH	Surface
/c/	'walk around'	ɻacuri-c-ɻacuri-c-	ɻacurilacuric-
	'breathe'	ŋawi-c-ŋawi-c-	ŋawiɲawic-
	'show'	mari-c-mari-c-	mariɲmaric-
	'chase'	ʈurua:-c-ʈurua:-c-	ʈurua:turua:c-
	'enter; poke into'	ca:-c-ca:-c-	ca:ca:c-
	'scratch'	kulu:-c-kulu:-c-	kulu:culu:c-
	'carry'	pati-c-pati-c-	paticpatic-
	'swear at'	jururi-c-jururi-c-	jururijururic-
	'sing'	wa:-c-wa:-c-	wa:ja:c-
/t̪/	'cook'	ɻarwa-t̪-ɻarwa-t̪-	ɻarwalarwat̪-
	'wait for'	ŋaka-t̪-ŋaka-t̪-	ŋakaɲakat̪-
	'keep warm'	ʈara-ʈara-t̪-	ʈaraʈarat̪-
	'descend'	t̪ula-t̪ula-t̪-	t̪ulat̪ulat̪-
	'spear at'	kuʈala-kuʈala-t̪-	kuʈalakuʈalat̪-
	'crouch'	purma-purma-t̪-	purmapurmat̪-

There are some apparent exceptions to the patterns just adduced. Each can be accounted for as follows.

My observation in the field was that younger speakers of Kayardild have not retained the traditional patterns of Kayardild verbal reduplication, and will often produce forms based on the template ROOT-ROOT-TH, irrespective of the root shape and thematic. On the other hand, senior speakers in my corpus always adhere to the patterns set out above.

The patterns above apply to reduplicated verbal roots, and although they also extend to middle and reciprocal verbal stems, they do not extended to all polymorphemic verbal stems (reduplication of polymorphemic stems is discussed in §3.12.1). Recognition of this fact is informative in the analysis of the verb stem *kamburij-* /kampuɻi-c-/ ‘talk’. At first glance it is unclear whether *kamburij-* consists of a single root plus thematic, or whether it represents a compound stem, comprised of the nominal root /kaŋ-/ ‘speech’ plus some verbal unit /puɻi-c-/.[12] Reduplication shows that the latter analysis is synchronically the correct one: the reduplicated form is consistently recorded not as *kamburijamburij-* (corresponding to a *root, kamburij-*), but as *kamburikamburij-*, corresponding to a compound *kam-burij-*.

The verb *kuwajuwath-* /kuacua-t̪-/ ‘twist’ appears at first to be a reduplication of non-lexical /kua-t̪-/ but with an unexpected change of root initial /k/→/c/ in the absence

[12] The unit /puɻi-c-/ is not attested as an independent verb, but almost certainly descends historically from *buriij-* /puɻiː-c-/, the middle form of *buruth-* /puɻu-t̪-/ ‘grasp’. Two attested, and related modern Kayardild idioms are *kangkiya burutha* ‘speak, lit. grasp speech’ and *kangka buriijburiija* ‘speak, lit. grasp one’s speech’.

of a triggering /c/ thematic. In fact, the appearance of reduplication is coincidental. The lexical stress pattern of *kuwajuwath-* shows that it is monomorphemic — it carries stress on its first and last syllable, not on its first and third as a reduplicated stem would (cf Ch.5 §5.3).

Evans (1995a:289) mentions a verb *karriyajarriyath-* (sic) 'churn up' which again appears to be a reduplication in which root initial /k/ becomes /c/ in the absence of a triggering /c/ thematic. Two Kayardild verbs are relevant to this case: *kariyath-* /kaɻia-t̪-/ 'cover, obscure OBJ', and its middle form *kariyaaj-* /kaɻiaː-c-/ 'cover, obscure (part of) oneself'. Evans' dictionary (Evans 1992; 1995a) gives no direct citation of a verb **kariyajariyath-*, but a translation is given of a single word utterance, *mala-kariya-jariyanda* 'he's mucking around, churning up the sea'. In this word form the verb stem is nominalised, and the nominaliser /n/ obscures what the final thematic of the verb is: it is possible that the verb which was nominalised is not **kariyajariyath-* but *kariyaajariyaaj-*. Indeed, a word *malakariyaajariyaanda* built on a nominalised, middle verb *kariyaaj-* and compounded with *mala-* 'sea', as a single word utterance would translate literally as 'that's the thing by which the sea is churned up'.[13]

Finally, the one true exception to the patterns set out above is the reduplication of *kalaj-* /kala-c-/ 'fly' which I have recorded as *kalakalaj-* not *kalajalaj-*. The motivation here appears to be avoidance of homophony, given the fact that another verb *kalajalaj-*

[13] Alternatively, if the original utterance was two words *malaa kariyaajariyaanda* it would mean 'the sea is getting churned up'.

/kalacalac-/ already exists, with the meaning ‘do all over’. I am unaware of any other, true exceptions to patterns above.

3.5 Stems of nominal roots, verbal roots and thematics

Nominal and verbal roots may form compound stems in Kayardild. Such compounds always begin with a nominal root and end with verbal root and thematic. In terms of its morphological category, the resulting stem is verbal. On the semantics of such compounds see Evans (1995a:290–96).

The phonological modifications which apply at the edges of roots in these stems are those of the ‘regular’ phonology. Examples are shown in (3.22):

(3.22)	a.	*kurndu-kurri-j-* kuɳʈukuric- kuɳʈuŋ-kuri-c- ‹chest-look›-TH- ‹look hard›-TH-	b.	*wara-baa-j-* waɻapaːc- waɻa-paː-c- ‹mouth-bite›-TH- ‹kiss›-TH-	c.	*marral-kinii-j-* maralkiniːc- maral-kiniː-c- ‹ear-cup$_{\text{NL}}$›-TH- ‹cup one’s ear›-TH-
	d.	*birdin-marra-j-* piʈinmarac- piʈiɲ-wara-c- ‹mis$_{\text{NL}}$-go›-TH- ‹go wrong way›-TH-	e.	*miji-laa-j-* micilaːc- micil-ɻaː-c- ‹net-sew›-TH- ‹sew a net›-TH-	f.	*nal-badi-j-* ɳalpatic- ɳal-pati-c- ‹head-carry›-TH- ‹carry on one’s head›-TH-

Evans (1995a:293–96) refers to nominal roots as *prefixes* in nominal–verbal compounds if either (i) the meaning and argument structure of the compound stem does not relate back in a transparent manner to that of the constituent roots; or (ii) the nominal root never appears on its own, i.e., it is non-lexical. In both cases, the analysis here will be that for the purposes of the grammar, such *prefixes* are nominal roots. They conform to the same morph structure conditions as nominal roots, and are stressed like nominal roots (cf Ch.5 §5.3.3).[14]

For more complex stems that contain both nominal and verbal roots, see §3.12.1 and §3.12.5.

3.6 Suffixes

This section examines suffixes in terms of their linear order (§3.6.1), their morph structure conditions (§3.6.2), their interaction with phonological modifications (§3.6.3) and their relationship to the morphological category of a stem (§3.6.4). Additional issues relating to suffixes in general are taken up in §3.12 below, and analyses of individual suffixes are discussed in §3.13. For discussion of the function of individual derivational suffixes, see Evans (1995a:188–97,276–88,455–69).

3.6.1 Linear order

Suffixes in Kayardild generally attach to the immediate right of a base, where a base is (i) a nominal root; (ii) a verbal root plus thematic; or (iii) a polymorphemic stem, possibly

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[14] It will be assumed here, uncontroversially, that the lexical entry of any morphologically complex, but semantically less-than-transparent stem contains reference to the formal constituents upon which the stem is built, as well as specifying additional, unpredictable semantic and syntactic information.

ending in a thematic. Suffixes themselves may consist of a single morph, or of a single morph plus a thematic.

The two exceptions to normal linear ordering are the formal middle (fMID), which sits to the immediate left of a thematic, and the formal reciprocal (fRCP), which replaces a thematic (and is itself followed by its own thematic, /t̪/), as illustrated in (3.23). These latter two suffixes are discussed further in §§3.13.1–3.13.3.

(3.23)	a.	*kurri-j-*	b.	*kurrii--j-*	c.	*kurri-nju-th-*
		kuric-		kuric-		kuriɲcuːt̪-
		kuri-c-		kuri-i-c-		kuri-ɲcu-t̪-
		see-TH-		see-fMID-TH-		see-fRCP-TH-

3.6.2 Morph structure conditions on suffixes

Suffixes exhibit a wider variety of forms than roots. Suffixes consist minimally of just one segment, and unlike roots may begin with a vowel (attested suffix initial vowels are /a, i, iː/), and with apical alveolar consonants (/r, l, n, t/). Phonological restrictions at the right edge of a suffix are determined by whether or not the suffix associates with a thematic (TH). Just like verbal roots, all suffixes that associate with TH are vowel final. Suffixes which do not associate with a thematic may end in a short vowel, or in a consonant or cluster. Underlying consonants and clusters attested at the right edge of suffixes form a subset of those attested at the end of nominal roots, as shown in (3.24).

(3.24) Attested final consonants and clusters

Nominal roots	ɻ	l	r	ɳ	n	ɲ	ŋ	t̪	c	k	lŋ	rŋ	ɻk	lk	rk
Suffixes		l	r		n	ɲ	ŋ	t̪	c			rŋ			

Stress in suffixes is treated in Ch.5, §5.3.5.

3.6.3 Suffixation and phonological modifications

Like any other combinations of morphs m_1+m_2, suffixal morphs are susceptible to phonological modifications. For suffixal morphs m_2 which begin with a consonant — just as for roots, which all begin with consonants — classes of modifications may apply either from the 'regular' or the 'exceptional' phonology. In fact at this point we can begin to distinguish two types of 'exceptional phonology', which will be referred to here as 'deleting' and 'leniting'. 'Deleting' phonology applies for example to the formal proprietive (fPROP) suffixal morph /kuɻu/. The initial /k/ is deleted after any preceding non-nasal segment, as illustrated in (3.25).

(3.25)

a.	*dangka-wuru-*	b.	*maku-wuru*	c.	*kirdil-uru*
	ʈaŋkauɻu-		makuuɻu-		kiʈiluɻu-
	ʈaŋka-kuɻu-		maku-kuɻu-		kiʈil-kuɻu-
	'man-fPROP-'		'woman-fPROP-'		'back-fPROP-'
d.	*balarr-uru-*	e.	*bith-uru-*	f.	*dulk-uru-*
	palaruɻu-		pit̪uɻu-		ʈulkuɻu-
	palar-kuɻu-		pit̪-kuɻu-		ʈulk-kuɻu-
	'white-fPROP-'		'smell-fPROP-'		'dirt-fPROP-'

After nasals, the initial /k/ is preserved, as illustrated in (3.26). Some additional points to note regarding the 'deleting' phonology, and the final segments of m_1, are these: the final velar /k/ of m_1 is preserved (3.25f); the final velar /ŋ/ is preserved (3.26d) and final /ɲ/ surfaces as a palatal, and palatalises a following /k/ to /c/ (3.26c).

(3.26)	a.	*daman-kuru-* ʈamankuɻu- ʈaman-kuɻu- ‘tooth-fPROP’	b.	*ngarn-kuru-* ŋaɳkuɻu- ŋaɳ-kuɻu- ‘sand-fPROP’
	c.	*kuwan-juru-* kuaɲcuɻu- kuaɲ-kuɻu- ‘fire stick-fPROP’	d.	*wumburung-kuru-* wumpuɻuŋkuɻu- wumpuɻuŋ-kuɻu- ‘spear-fPROP’

Leniting phonology applies for example to the formal plural (fPL) suffixal morph /palat̪/. In the ‘leniting’ phonology, initial plosives in m_2 are lenited to a semivowel after a preceding continuant (3.27a–e); they remain plosives after non-continuants, as shown in (3.27f–i).

(3.27)	a.	*dangka-walath-* ʈaŋkawalat̪- ʈaŋka-palat̪- ‘man-fPL-’	b.	*maku-walath-* makuwalat̪- maku-palat̪- ‘woman-fPL-’	c.	*wurrkardil-walath-* wurkaʈilwalat̪- wurkaʈil-palat̪- ‘dune-fPL-’
	d.	*thawurr-walath-* t̪aurwalat̪- t̪aur-palat̪- ‘stream-fPL-’	e.	*kantharr-walath-* kan̪t̪arwalat̪- kan̪t̪ark-palat̪- ‘alone-fPL-’	f.	*-yarraj-balath-* -jaracpalat̪- -jarat̪-palat̪- ‘-fANOTH-fPL-’
	g.	*dathin-balath-* ʈat̪inpalat̪- ʈat̪in-palat̪- ‘that-fPL-’	h.	*duujin-balath-* ʈuːcinpalat̪- ʈuːciɲ-palat̪- ‘y.Br-fPL-’	i.	*wijam-balath-* wicampalat̪- wicaŋ-palat̪- ‘hiding place-fPL-’

In the ‘leniting’ phonology, note that final /ŋ/ in m_1 surfaces though it may shift in place of articulation (3.27i); final /ɲ/ in m_1 surfaces not as /ɲ/ but as /n/ (3.27h); and final /k/ in m_1 does not surface (3.27e).

The formal genitive (fGEN), which undergoes modifications from the ‘regular’ phonology, is illustrated in (3.28). As is typical of the regular phonology, the initial consonant of m_2 always surfaces. Also, as in the ‘leniting’ phonology, final underlying /ɲ/ in m_1 is realised as /n/.

(3.28)	a.	*dangka-karrany-* ʈaŋkakaraɲ- ʈaŋka-karaɲ- ‘man-fGEN-’	b.	*maku-karrany-* makukaraɲ- maku-karaɲ- ‘woman-fPRIV-’	c.	*nal-karrany-* ɳalkaraɲ- ɳal-karaɲ- ‘head-fGEN-’
	d.	*thawurr-karrany-* t̪aurkaraɲ- t̪aur-karaɲ- ‘stream-fGEN-’	e.	*yarbu-karrany-* jaɻʈukaraɲ- jaɻʈut̪-karaɲ- ‘animal-fGEN-’	f.	*yarraman-karrany-* jaramankaraɲ- jaraman-karaɲ- ‘stockman-fGEN-’
	g.	*duujin-karrany-* ʈuːcinkaraɲ- ʈuːciɲ-karaɲ- ‘y.Br-fGEN-’				

When they are m_2 in a combination m_1+m_2, many suffixes *always* undergo the same class of phonological modifications — whether it be from the ‘regular’, ‘deleting’ or ‘leniting’ phonology. This is true of fPROP, fPL and fGEN shown above in (3.25)–(3.28). Other suffixes though may undergo different modifications in different circumstances. In some instances, the choice of phonology type is determined by one or other of the morph’s functions. For example, the formal privative (fPRIV) undergoes ‘deleting’ phonology when used derivationally as the ‘negative nominaliser’ (3.29a), and undergoes ‘regular’ phonology in inchoativised privative stems such as in (3.29b).

(3.29)	a.	*banga-wala-th-**arri**-*	b.	*ya-**yarri**-wa-th-*
		**banga-wala--yarri-*		**yath-arri-wa-th-*
		paŋawalat̪ari-		jajariwat̪-
		paŋa-wala-t̪-wari-		jat̪-wari-wa-t̪-
		turtle-miss-TH-fPRIV-		‹laugh-fPRIV-fINCH›-TH
		‘a non-misser (with a spear) of turtles’		‹stop laughing›-TH

On other occasions, the choice of phonology is idiosyncratic, as in the derived stems in (3.30) — both stems are composed of ROOT+fPRIV, and semantically speaking, both are partially transparent, yet (3.30a) undergoes modifications from the ‘deleting’ phonology while (3.30b) undergoes modifications from the ‘regular’ phonology.

(3.30)	a.	*bith-arri-*	b.	*mibur-warri-*
		**bi-yarri-*		**mibur-arri*
		pit̪-wari-		mipuɻ-wari-
		(good) smell-fPRIV-		eye-fPRIV-
		‘stinking’		‘blind’

Several Kayardild suffixes contain laminal segments which surface sometimes as laminal palatals, and other times as laminal dentals. These alternations will be analysed in Ch.4 in terms of modifications which convert underlying dentals into palatals when they appear on the surface immediately after high vowels or long vowels. Those modifications can be seen applying to formal remote (fREM) /t̪/ in (3.31c) and to thematic (TH) /t̪/ in (3.31d).

(3.31)	a.	*riya-th-iy-a*	b.	*kala-tha*	
		ɻiat̪ia		kalat̪a	
		ɻia-t̪-ki-a		kala-t̪a	
		east.fLOC-fREM-fLOC-T		cut-TH.T	
	c.	*rar-i-j-iy-a*	d.	*kalaa--ja*	
		ɻaɻicia		kalaːca	
		ɻaɻ-ki-t̪-ki-a		kala-i-t̪a	
		south-fLOC-fREM-fLOC-T		cut-fMID-TH.T	

Additional complications are introduced into the phonology of Kayardild by suffixes which begin underlyingly with vowels. The complexities relate to a general dispreference for surface strings of vowel+/i(:)/ across morph boundaries. Precisely how this dispreference plays out is morphologically conditioned, and no fewer than five different classes of modifications can be identified. These are described comprehensively in Ch.4, §4.4. The five patterns of hiatus resolution must also be taken in the context of modifications that apply to consonants. Some examples will illustrate this point.

A common pattern of hiatus resolution involves the avoidance of /V+i/ strings by deletion of underlying /i/ which would otherwise appear after a vowel. This can be seen in (3.32). In (3.32a) the underlying /i/ of fSAME surfaces because it follows a consonant and so does not enter into a /V+i/ string; in (3.32b,c) the /i/ is deleted.

(3.32)	a.	*birji-n-ij-*	b.	*warirra-j-*	c.	*ngarrwarri-j-*
		piɻcinic-		waɻirac-		ŋarwaric-
		piɻci-c-n-ic-		waɻira-ic-		ŋarwari-ic-
		be alive-TH-fN-fSAME-		nothing-fSAME-		alive-fSAME-
		‘still alive’		‘still nothing’		‘still alive’

A different pattern is shown in (3.33) — one which also illustrates the fact that consonant phonology and hiatus resolving phonology interact. When the formal continuous (fCONT) morph /iːc/ attaches to stems, the m_1+m_2 combination undergoes (i) modifications from the ‘regular’ phonology including the deletion of stem final /ŋ/, and (ii) hiatus resolving phonology in which surface /V+iː/ strings are avoided by deleting /V/. In (3.33b) for example, this means that fALL /ɻuŋ/ loses both /ŋ/ (because it is stem final) and /u/ (because it would otherwise immediately precede /iː/).

(3.33)	a. *bath-in-iij-*	b. *ba-l-iij-*	c. *Balarr-i-r-iij-*
	pat̪iniːc-	paliːc-	palariɻiːc-
	pat̪-in-iːc-	pat̪-ɻuŋ-iːc-	palar-ki-ɻiŋ-iːc-
	west-fCABL-fCONT-	west-fALL-fCONT-	white-fLOC-fALL-fCONT-
	‘continuously from the west’	‘continuously to the west’	(Place name)

For further discussion of hiatus resolution, see Ch.4, §4.4.

3.6.4 Derivational suffixes and morphological category

As mentioned earlier, lexical stems fall into one of two morphological classes: nominal or verbal. All verbal stems end in a thematic, and all nominal stems do not. Accordingly, if a derived stem is formed by adding to a base a derivational suffix that is associated with a thematic, then the derived stem will be verbal; if it is formed by adding a derivational suffix that is not associated with a thematic, then the derived stem will be nominal. (On the more complex issue of thematics in inflection, see Ch.6, esp. §6.2.6.)

This closes the discussion of the key properties of suffixes in Kayardild. Later in the chapter, §3.12 addresses a number of additional, general issues and §3.13 contains analyses of specific suffixes.

3.7 The termination, T

One of the more idiosyncratic features of Kayardild word structure is the presence of the termination, T, at the end of each syntactic word. As an analytic move, positing the termination T affords an account of a disparate set of phenomena in a manner which is self-consistent, and coherent within the broader analysis of word structure developed in the dissertation. The phenomena covered by T all relate to the right edge of Kayardild words, and include aspects of structure which are treated by Evans (1995a) sometimes in terms of a *nominative* suffix, and sometimes in terms of special, word-final allomorphs of morphemes. The section is organised as follows. A short diachronic introduction is offered in §3.7.1 in order to provide an initial insight into how Kayardild words acquired their curious right edges. A full review of the forms which T takes is then presented in §3.7.2, after which §3.7.3 discusses the analysis of those forms in terms of a termination morph rather than a nominative suffix. The phonology of T's realisations is discussed in §3.7.4 and §3.7.5 discusses T with respect to the realisation of two inflectional features on verbs.

3.7.1 Diachronic background

Both synchronically and historically, the right edges of words in all Tangkic languages are interesting places. The diachronic sketch which follows is based a comprehensive reconstruction in Round (in prep.-a).

In pre-proto Tangkic, processes of external sandhi began altering and deleting word final consonants in the context of a following, initial consonant in the next word. Due to the contextualised nature of these changes, utterance final consonants were unaffected. At the same time, a word final short /a/ vowel was deleted utterance finally, much as in modern Kayardild. This produced a tension in which all positions in the utterance contributed to the deletion of some kind of word final segment: consonants utterance internally, and vowels utterance finally. Spates of historical change can then be reconstructed in which words in various positions were altered so as to more closely resemble those in others, or were altered so as to follow the alternations found in other, similar words. Such analogical levelling led to the permanent loss of some word final segments, to the neutralisation of word final laminals and apicals, and even to the accretion of new material on some words. All of these historical changes persist in at least some corners of the phonology and morphology of modern Kayardild. For example, the 'regular' phonology still productively deletes final /ŋ/ from stems of two or more syllables (and the same occurs in Lardil; Hale 1973), while both the 'regular' and 'leniting' phonology neutralise stem final /ɲ/ with /n/ — these processes are frozen sandhi phenomena, processes which originally applied between independent words, then became part of the phonology of compounds, and then later part of the general phonology. Likewise, many doublets exist in Kayardild in which one form possesses, and one form lacks, a final /ɲ/ segment (on this point, see §3.13.4 below), and as will we see shortly, the termination is implicated in the effective loss of /ŋ/ and /t̪/ from certain word final suffixes. By far the most obvious outcome in modern Kayardild of these historical shifts though, is the *addition* of material to the ends of words. This addition began historically as process which applied only to short words of one, or perhaps two, syllables (and it remains so in modern Lardil). In the Southern Tangkic languages, the addition of phonological material then spread to all regular stems (the exceptions were stems ending in morphs which had already developed distinctive word final forms).

3.7.2 The termination and its realisations

In the present analysis of Kayardild, the synchronic adding and deleting of word final segments will be treated in terms of T. As a meaningless piece of morphology, T appears at the end of every syntactic word.[15] It may appear as a distinct morph, in which case it typically contributes extra segmental material to the word's end, or it may be realised cumulatively with another morph, in which case the latter morph effectively takes on a special, 'word final' form.[16]

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[15] It would be incorrect to state that T appears at the end of *prosodic* words, since T can be followed within the prosodic word (but not within the syntactic word) by certain clitics, cf §3.11.

[16] The end effect of this is much the same as Evans' (1995a) analysis in which some suffixes have both 'word final' and 'protected' (i.e., word-internal) allomorphs, although it has the advantage of explaining why the normal form of T (or Evans' *nominative suffix*) does not appear after the 'word final' forms.

Table (3.34) lists the forms taken by T when the sole conditioning factor is the phonological shape of the base to which it attaches. These are: (i) no overt realisation after bases over two morae in length and ending in /a/, or of any length and ending in /uu/; (ii) /a/ after all other bases ending in a vowel; (iii) /ta/ after bases ending in a coronal consonant; and (iv) /ka/ after bases ending in a velar consonant. For further discussion of the underlying forms of regular T, see §3.7.4 below.

(3.34) Regular, phonologically conditioned forms of T

Base properties		T, and Examples	Underlying		Surface
final string	mora count	gloss	base	T	base-T
/a/	>μμ	'big'	cuŋara	-ø	cuŋara
		'who'	ŋaːka	-ø	ŋaːka
/aa/		-fABL	-naa	-ø	-naa
/uu/		-fPROP	-kuu	-ø	-kuu
/a/	μ	'foot'	ca	-a	caa[17]
/a/	μμ	'man'	ʈaŋka	-a	ʈaŋkaa
/i/	(any)	'east'	ɻi	-a	ɻia
		'bad'	piʈi	-a	piʈia
		'shark'	kulkici	-a	kulkicia
/u/	(any)	'woman'	maku	-a	makua
		'large'	paʈaŋu	-a	paʈaŋua
/r/	(any)	'stone'	kamar	-ta	kamara
/ɻ/		'eye'	mipuɻ	-ta	mipuɻta
/l/		'leaf'	wiril	-ta	wirilta
/ɳ/		'hollow'	campaɳ	-ta	campaɳta
/n/		'tooth'	ʈaman	-ta	ʈamanta
/ɲ/		'low tide'	kapiɲ	-ta	kapinta
/t̪/		'animal'	jaɻput̪	-ta	jaɻputa
/c/		'one'	waɻɲiːc	-ta	waɻɲiːta
/ŋ/	(any)	'together'	t̪at̪uŋ	-ka	t̪at̪uŋka
/k/		'tree sp.'	kirik	-ka	kirika
/lŋ/		'stingray sp.'	kuʈalalŋ	-ka	kuʈalalŋka
/rŋ/		'two'	kiarŋ	-ka	kiarŋka
/ɻk/		'below'	jaɻk	-ka	jaɻka
/lk/		'mud'	maʈalk	-ka	maʈalka
/rk/		'alone'	kan̪t̪ark	-ka	kan̪t̪arka

Several suffixal morphs *m* have special forms which cumulatively realise both *m* and T. For example, the formal negative (fNEG) is usually underlying /naŋ/; if this were the extent of

[17] On the alternative form /caɻa/, see §3.12.1.1.

fNEG's phonological and morphological properties, we would expect it to be followed by T /ka/ at the end of a syntactic word. This is not the case though. Instead, a cumulative morph, which is phonologically /na/, realises both fNEG and T. A word which ends in this fNEG.T morph satisfies the condition that every syntactic word end in T. Examples of fNEG in word non-final position, and fNEG.T in word final position and are shown in (3.35).

(3.35)	a.	*warra--nang-ku-*	b.	*warra--na*
		waranaŋkuu		warana
		wara-c-naŋ-kuu-ø		wara-c-na
		go-TH-fNEG-fPROP-T		go-TH-fNEG.T
		go-ø-NEG-POT-ø		go-ø-NEG.IMP

A full list of suffixal morphs which are realised cumulatively with T is given in (3.36). Regarding the thematic TH and T, see §3.7.5 below; regarding the increment /ɻ/ and T, see §3.12.1.

(3.36) Morphs realised cumulatively with T

MORPH		Usual form	Form of MORPH.T
Formal allative	(fALL)	/ɻiŋ/	/ɻi/
		/ɻuŋ/ (in song)	/ɻu/
Formal negative	(fNEG)	/naŋ/	/na/
Formal dual	(fDU)	/palat̪/	/palaa/
Formal genitive	(fGEN)	/karaɲ/	/kara/
Thematic	(TH)	/c/, /t̪/	/ca/, /t̪a/
Increment	(INC)	/ɻ/	/ɻa/

In addition to suffixes, two roots are realised cumulatively with T.

The high-frequency root *dathin-* /ʈa̪tin/ 'that; there' has the cumulative T form *dathina* /ʈa̪tina/. All inflected and derived forms based on 'that; there' are based on /ʈa̪tin/.

The root *mawurraji* /mauraci/ 'fighting spear' has the optional, cumulative T form *mawurrajinda* /mauracinta/ — as if the root were */mauracin/, as shown in (3.37a,b). The root */mauracin/ however never appears under other circumstances, as illustrated in (3.37c).

(3.37)	a.	*mawurrajiy-a* mauraci-a spear-T	~ b.	*mawurrajinda* mauracinta spear.T
	c.	*mawurraji-wuruw-a* mauraci-kuɻu-a spear-fPROP-T		* *mawurrajin-kuruw-a* mauracin-kuɻu-a

3.7.3 Why the termination is not a nominative suffix

To a large extent — but not entirely — Evans' (1995a) analysis of the facts relating to the ends of words is commensurate with the proposal here. Generally, where the present analysis posits cumulative morphs involving T, Evans posits special, word final allomorphs of suffixes, and where the phonologically conditioned T morph in table (3.34) appears, Evans posits a *nominative* suffix. This section sets out reasons why T is not treated here as a meaningful, nominative suffix. For the purposes of the discussion, inflectional categories will be referred to in accordance will Evans' (1995a) analysis of Kayardild. The *nominative* suffix of Evans' analysis will be abbreviated NOM. Reference to NOM is to Evans' category, while reference to T is to the entity advocated here. An analysis of

Kayardild which invokes NOM rather than T will be referred to as adopting the **nominative (NOM) hypothesis**.

The initial appeal of the nominative hypothesis lies in two observations. The first observation is that all verbal words are minimally three morae in length, and most end in /a/ or /uu/, and therfore do not end in any overt exponent of T/NOM. The nominative hypothesis supposes that NOM is simply not present at the end of these words, as shown in (3.38a).

(3.38) Initial motivation and reasoning behind the nominative hypothesis

	Class of inflected word	Base properties	Overt T/NOM	Analysis
a.	Verbal words	All >μμ, most ending in /a/ or /uu/	usually none	NOM not present
b.	Nominal words in non-NOM cases	Most ending in /a/ or /uu/	usually none	NOM not present
c.	Other nominal words	Various	none, or often /a, ta, ka/	NOM is present

The second observation is that most (non-nominative) case marked nominal words also end in /a/ or /uu/, and so also do not end in any overt exponent of T/NOM, and so the nominative hypothesis supposes that NOM is not present there either, as in (3.38b). This leaves just one main class of word at the end of which T/NOM appears overtly: nominal words which are not inflected for non-nominative case. Under such circumstances it is appealing to label T/NOM as an overt exponent of the nominative case category, i.e., as a nominative case suffix, as in (3.38c). To maintain this analysis though, there are some exceptions which need to be addressed.

Evans notes that NOM does appear after one class of (non-nominative) nominal suffixes termed *adnominal case* suffixes (1995a:136–37). For convenience, let us refer to *adnominal cases* as **A-cases**, and *adnominal case* suffixes as **A-suffixes**. This difference between A-case and all other cases is a central component of the nominative hypothesis, which can now be refined as in (3.39), in which line (c) has been newly added.

(3.39) Refined nominative hypothesis

	Class of inflected word	Base properties	Overt T/NOM	Analysis
a.	Verbal words	All >μμ, most ending in /a/ or /uu/	usually none	NOM not present
b.	Nominal words in most non-NOM cases	Most ending in /a/ or /uu/	usually none	NOM not present
c.	Nominal words in A-cases	Various	none, or often /a, ta, ka/	NOM is present
d.	Other nominal words	Various	none, or often /a, ta, ka/	NOM is present

At first glance, the observation that NOM occurs after A-cases suggests that the distribution of NOM — a morphologically meaningful suffix — is best expressed in terms of morphological categories. However, as we examine that facts more closely, the true generalisations will turn out to be phonological.

We begin by noting that the A-suffixes which realise A-cases are often morphs that end in consonants, /i/ or /u/ — such as the formal origin (fORIG) /waːɲ/, formal instrumental (fINST) /ŋuni/, formal privative (fPRIV) /wari/ and formal associative (fASSOC) /ŋ̪uru/. This raises an initial suspicion, that NOM is actually distributed according to phonological, and not morphological criteria.

We can next consider word final inflectional suffixes which are not A-suffixes, and which according to the nominative hypothesis should not be followed by NOM. The first of these is the formal locative (fLOC), which realises the modal locative and complementising locative cases (neither of which are A-cases), as well the immediate tense.

Under the analysis in this dissertation, fLOC ends in /i/ (it is underlyingly /ki/), and so is followed regularly by T /a/ at the end of a word, as in (3.40a). On Evans' analysis, that same /a/ vowel is not NOM, but rather part of an allomorph of fLOC which ends in /ia/, as shown for example in (3.40b).

(3.40)	a.	*dathin-kiy-a*		b.	*dathin-kiya*
		ʈa̪t̪in-ki-a			ʈa̪t̪in-kia
		that-fLOC-T			that-COMPLEMENTISING.LOC
		that-COMP-ø			(after Evans 1995a)

By positing this allomorphy in fLOC, it is possible to maintain the claim that NOM only follows A-suffixes, and that is does not follow fLOC. However, there are two other, parallel cases which need to be addressed.

The fPRIV morph /wari/ realises the privative case. The privative is an A-case, and so on the nominative hypothesis, the word final /a/ which follows fPRIV is NOM, as shown in (3.41b).

(3.41) a. *maku-warriy-a*
maku-wari-a
that-fPRIV-T
that-PRIV-ø

b. *maku-warriy-a*
maku-wari-a
that-PRIV-NOM
(after Evans 1995a)

c. *warra-j-arriy-a*
wara-c-wari-a
go-TH-fPRIV-T
go-ø-NEG.ACT-ø

d. *warra-jarriy-a*
wara-cari-a
go-NEG.ACT-(?)
(after Evans 1995a)

However, fPRIV also realises the 'negative actual' tense, and when it is final in the word it is also followed by /a/, as shown in (3.41c,d). To maintain the nominative analysis of T in the face of this fact, we will need to posit a word final allomorph of the 'negative actual' suffix which ends in /ia/. This is despite the fact that no such allomorphy is needed for the privative A-suffix.

The fPROP morph usually surfaces with a final /uu/ sequence. Among other things, it realises the modal proprietive case (not an A-case), and the potential tense. fPROP also occasionally surfaces with final /uɻu/, in which case it is followed word finally by /a/, as illustrated in (3.42).

(3.42) a. *dathin-kuruw-a*
ʈa̪tin-kuɻu-a
that-fPROP-T
that-FUT[18]-ø

b. *dathin-kuruw-a*
ʈa̪tin-kuɻu-a
that-MODAL.PROP-(?)
(after Evans 1995a)

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[18] In this dissertation, the future (FUT) value of the athematic tense/aspect/mood (A-TAM) feature corresponds to Evans' modal proprietive category.

Again, to preserve the nominative hypothesis of T, we will need to posit a word final allomorph /kuɽua/.

What we find is that in order to maintain the nominative hypothesis in the face of a complete data set, it is necessary to posit word final allomorphs with an extra /a/ for every non-A suffix which ends in /i/ or /u/ (there are no non-A suffixes which end in consonants). This in turn undermines any claim that the distribution of NOM is truly governed by morphological factors — since wherever NOM does not appear, we require allomorphy which produces precisely the same effect as if it did.

Given the evidence, the nominative hypothesis is not sustainable. It is simpler to dispense with the morphologically meaningful NOM suffix and recognise instead the presence of a formal element with no meaning, and whose realisation is determined by the phonology of its base.

3.7.4 The phonology of regular T

The surface realisations of (non-cumulative) T are analysed in terms of three overt exponents /a, ta, ka/, and in terms of a lack of overt realisation, as shown in (3.34) above. This section mentions the motivations behind the analysis, and its connections to other aspects of Kayardild phonology.

The realisation of T after consonant final bases is analysed as /ta/ after coronals and /ka/ after velars. The fact that T surfaces as /a/ after /r/-final bases can be related to the absolute ban on /rt/ clusters in Kayardild (cf Ch.2 §2.3). To avoid /rt/, /t/ is deleted (though the fact that it is /t/, and not /r/ which is deleted is unique to T). Conceivably, one could further simplify T by unifying the allomorphs /ta/ and /ka/ as /Ca/ for some consonant C, and derive the coronal/velar distinction through a process of limited assimilation. However, no such phonological process is attested elsewhere in Kayardild, and so that analysis will not be pursued here.

Turning to the realisation of T after vowels, the fact that T is /a/ after bimoraic bases ending in /a/, but has no overt realisation after /a/ otherwise, cannot be related to any other known fact of Kayardild phonology, including prosodic phonology: foot structure for example is sensitive only to syllables, not to morae (cf Ch.5). On the other hand, the fact that T has no overt realisation after /uu/ can be accounted for. Kayardild does not permit surface strings of three, adjacent short vowels of which the first two are identical. The lack of /a/ after /uu/ can be attributed to this ban (see also §3.13.9 below for other cases of allomorphy in which the same ban is implicated).

When the allomorph /ka/ follows base final /ŋ/, the /ŋ/ survives at the surface, indicating that /ka/ triggers modifications from the 'exceptional phonology'. Given that this is so, one could in principle claim that the /a/ allomorph after vowels is also actually underlyingly /ka/ — since in the exceptional phonology /V-ka/ should surface as /Va/. I am disinclined to adopt such an analysis however, as follows. Although the analysis would economise by collapsing the /a/ and /ka/ allomorphs, the key allomorphy between /ta/ and /ka/ would remain. Considering that the basis of /ta/~/ka/ allomorphy is the place of articulation of the base final segment, the positing of a single, /ka/ allomorph after both velar consonants and vowels results in a decrease in the systematicity of the allomorphy, relative to a set with /ta/ after coronals, /ka/ after velars and /a/ after vowels.

Each of the three overt allomorphs of T end in /a/. This invites the consideration of an analysis in which the /a/ segment is entirely phonological — an epenthetic segment inserted to ensure that words end in a low vowel. There are reasons to reject such an analysis though, related to the appearance of /a/ after /i/. Generally, T is /a/ after /i/, as in (3.43a), but this does not mean that there are no words ending in /i/, rather word final /i/ does occur, in words ending in fALL.T /ɻi/, as shown in (3.43b).

(3.43)	a.	*dathin-ki-a*	b.	*dathin-ki-ri*
		ʈa̪t̪in-ki-a		ʈa̪t̪in-ki-ɻi
		that-fLOC-T		that-fLOC-fALL.T

It would not be valid to claim that the final /a/ in (3.43a) is inserted on purely phonological grounds, without also providing a mechanism by which the final /i/ in (3.43b) is exempt, on morphological grounds. This mechanism would come on top of the allomorphy already needed in order to handle the distribution of /t(a)/ and /k(a)/, and on top of the morphological specificity of cumulative morphs such as fALL.T — which among other things, account for a lack not just of /a/ but also of /k/ after word final /ɻiŋ/. That is to say, an analysis with 'phonological insertion' of /a/ would require the introduction of new, morphologically sensitive machinery, but without making redundant any of the existing machinery. To avoid these complications, it is simpler to treat T as underlyingly /a/, /ta/ and /ka/, with no phonological insertion of /a/.

3.7.5 Actual and imperative TH-TAM, and T

Verbs which take the actual and imperative value of the thematic tense/aspect/mood (TH-TAM) feature end in a thematic TH followed by /a/. The question arises, whether this /a/ is a TH-TAM suffix, or perhaps a realisation of cumulative TH.T (let us assume, given the discussion above, that the /a/ vowel is not inserted by phonological epenthesis). Arguments in either direction are difficult to identify, but one line of reasoning does suggest that the /a/ is part of a TH.T morph.

Apart from TH-TAM:actual and TH-TAM:imperative, all TH-TAM categories which are combinable with the NEGATIVE inflectional feature maintain a uniform (underlying) exponence when they do so. Examples are shown in (3.44) — note the correspondences fPROP :: fNEG-fPROP, fLOC :: fNEG-fLOC, fCONS :: fNEG-fCONS.

(3.44)

	TH-TAM:potential	TH-TAM:immediate	TH-TAM:prior
Plain	*warra-j-uu-* wara-c-kuu-ø go-TH-fPROP-T go-ø -POT-ø	*warra-j-i-a* wara-c-ki-a go-TH-fLOC-T go-ø -IMMED-ø	*warra-j-arra-* wara-c-ŋara-ø go-TH-fPROP-T go-ø -PRIOR-ø
With NEG	*warra--nang-kuu-* wara-c-naŋ-kuu-ø go-TH-fNEG-fPROP-T go-ø -NEG-POT-ø	*warra--nang-ki-a* wara-c-naŋ-ki-a go-TH-fNEG-fPROP-T go-ø -NEG-IMMED-ø	*warra--nang-arra-* wara-c-naŋ-ŋara-ø go-TH-fNEG-fCONS-T go-ø -NEG-PRIOR-ø

This is not the case for TH-TAM:actual or TH-TAM:imperative. When TH-TAM:imperative combines with NEGATIVE, only an overt marker of the latter appears, as shown in (3.45). In the case of TH-TAM:actual, a cumulative morph suffices to mark both categories:

(3.45)

	TH-TAM:imperative	TH-TAM:immediate
Plain	*warra-ja*	*warra-ja*
	wara-ca	wara-ca
	go-TH.T	go-TH.T
	go-ø (IMP)	go-ø(ACT)
With NEG	*warra--na*	*warra-j-arri-a*
	wara-c-na	wara-c-wari-a[19]
	go-TH-fNEG.T	go-TH-fPRIV-T
	go-ø -NEG.IMP	go-ø-NEG.ACT-ø

Going by the fact that (i) regular, dedicated markers of TH-TAM features usually do appear in negative verbs; (ii) this is not the case for TH-TAM:imperative and TH-TAM:actual; and (iii) that the forms of *non*-negative TH-TAM:imperative and TH-TAM:actual verbs can be accounted for in terms of T, it seems best to analyse non-negative imperative and actual TH-TAM verb forms in terms of TH.T, as shown in (3.45).

3.7.6 The termination, in summary

The termination, T, is analysed as a meaningless element that appears at the end of each word (§3.7.3). Although it is meaningless, it cannot be reduced to mere phonology due to its morphological conditioning (§3.7.4). As such, it is treated here as a meaningless morphome, one which appears as the final element in a syntactic word and which is sometimes realised phonologically as an independent morph (/ta/, /ka/ or /a/), sometimes is not realised at all, and sometimes is realised cumulatively with another morpheme.

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[19] This /a/ is T, and not for example an exponent of TH-TAM:actual, as shown by its absence when fPRIV is followed by other material such as *marraajarrida* /mara:-c-wari-ic-ta/ 'show-TH-fPRIV-fSAME-T, i.e., still hasn't shown'.

3.8 Morphs obscured by phonological modifications

Because of the effects of consonant cluster simplification, and of hiatus resolution, there are cases in which a morph is analysed as being underlyingly present even though it fails to appear in the surface form of some words. In all such cases, the reasoning behind the analysis is this: (i) that in morphologically comparable forms, the morph in question can be identified as present at the underlying phonological level; and (ii) that phonological modifications for which there is independent evidence are expected to cause the deletion of the morph at the surface. Two examples follow: the formal locative (fLOC) in §3.8.1 and thematic TH in §3.8.2.

3.8.1 The formal locative, fLOC

One suffix which is often deleted at the surface is the fLOC /ki/. The fLOC undergoes modifications from the 'deleting' phonology which usually result in /k/ being deleted. It then also undergoes hiatus resolution, in which case /i/ can also delete. This is seen in (3.46). The underlying /k/ survives only after a nasal (and is palatalised to /c/ after /ɲ/), but otherwise does not surface. When /k/ deletes (3.46d,e,f), the remaining /i/ becomes /j/ between two vowels (3.46e) and deletes entirely in the environment /V__C (3.46f).

(3.46)

a. *dathin-kiy-a* ʈat̪inkia ʈat̪in-ki-a that-fLOC-T that-INS-Ø	b. *duujin-jiy-a* ʈuːciɲcia ʈuːciɲ-ki-a younger sibling-fLOC-T younger sibling-INS-Ø	c. *burung-ki-na-* puɻuŋkinaa puɻuŋ-ki-naa-ø ripe-fLOC-fABL-T ripe-Ø-ABL-Ø
d. *yarbuth-iy-a* jaɻput̪ia jaɻput̪-ki-a animal-fLOC-T animal-INS-Ø	e. *dangka-y-a* ʈaŋkaja ʈaŋka-ki-a person-fLOC-T person-INS-Ø	f. *dangka--na-* ʈaŋkanaa ʈaŋka-ki-naa-ø person-fLOC-fABL-T person-Ø-ABL-Ø

3.8.2 The thematic, TH

The analysis here of the thematic TH differs from the analysis of the same empirical facts in Evans (1995a). The difference hinges primarily on the identification of environments in which TH can be expected not to surface.

Evans (1995a: 254–5) notes that most inflected verbs end in a thematic element /t̪/ or /c/ plus some additional material, which is usually cognate with a CASE suffix. The thematic and this additional material are treated as two parts of a single *tense* morpheme (1995a: 256). Table (3.47) shows a selection of inflected forms of two verbs. Notice that the inflected forms above the middle line contain a thematic /t̪/ or /c/ on the surface, while those below the line lack it.

(3.47) Segmentation after Evans (1995a)[20]

	'gather'		'go'	
a.	*buru-tha*	puɻu-t̪a	*warra-ja*	wara-ca
b.	*buru-thu*	puɻu-t̪uː	*warra-ju*	wara-cuː
c.	*buru-tharra*	puɻu-t̪ara	*warra-jarra*	wara-cara
d.	*buru-nharra*	puɻu-n̪ara	*warra-nyarra*	wara-ɲara
e.	*buru-da*	puɻu-ta	*warra-da*	wara-ta
f.	*buru-n-*	puɻu-n-	*warra-n-*	wara-n-

To account for the appearance and distribution of two variants of most tense suffixes, Evans posits two morphological declensions of verb stems, members of which consistently select either for dental-initial or for palatal-initial *allomorphs* of tense inflections whenever such allomorphs are available. When only one allomorph is available, both declensions inflect alike (3.47e,f). An alternative analysis suggests itself though, when the forms in (3.47) are compared against productive phonological modifications.

In Kayardild, all underlying clusters of obstruent+nasal surface as (nasal+)nasal, and most underlying C_1+C_2 clusters in which C_1 is laminal, and C_2 is non-apical, surface as C_3(C_4) where C_3 is laminal. Correspondingly, one could analyse the forms in (3.47d) as resulting from underlying /...t̪+Nara/ and /...c+Nara/ clusters for some non-apical nasal N (in fact, the analysis here is that N is /ɲ/). In addition, all underlying C_1+C_2 clusters in which C_1 and laminal and C_2 is apical surface as C_3 where C_3 is apical alveolar. Again, one could analyse the forms in (3.47e,f) as resulting from underlying /...t̪+ta/, /...c+ta/ and /...t̪+n/, /...c+n/. With these observations in place, an analysis suggests itself in which *all*

[20] Verb stems are inflected for: a. TH-TAM:actual, b. TH-TAM:potential, c. TH-TAM:past, d. TH-TAM:apprehensive, e. TH-TAM:desiderative, f. TH-TAM:continuous. See Ch.6 regarding inflection and inflectional feature values.

verb forms contain one of the two thematics /t̪/ or /c/ underlyingly, at the edge of the stem and the suffix. If we suppose that the thematic is part of the stem, then the suffixes which attach to those stems become more uniform: instead of /n̪ara/~/ɲara/ allomorphy for example, we now have uniform /ɲara/ which attaches to verb stems which end either in /t̪/ or /c/. Moreover, morphological declensions of verbs can be dispensed with, since the equivalent information is now represented directly in the final /t̪/ or /c/ of the stem.

Let us at this point entertain an alternative analysis, particularly of the cases in (3.47e,f). Here, one might suggest that the verb suffix is not added concatenatively to a stem ending in TH /t̪/ or /c/, but that it simply replaces TH instead. Although this 'replacive' analysis is capable of accurately capturing the empirical facts, it is less explanatory than the concatenative analysis, as it does not offer any account as to why the only replacive suffixes are apical-initial. The concatenative analysis does explain this fact: 'replacive' suffixes are apical initial, because only apical initial suffixes will cause the preceding laminal TH to delete according to the normal phonological patterns in Kayardild.[21]

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[21] Hypothetically, clear support for the replacive analysis would be provided by replacive suffixes beginning with /p/ for example, as shown in (a), the reason being that according to productive phonological processes, concatenated /…t̪+pa/, /…c+pa/ should surface as /…cpa/ and not /…pa/. Such support is lacking though.

(a) A hypothetical, replacive suffix */pa/

	'gather'		'go'	
a.	*buru-ba*	puɻu-pa	*warra-ba*	wara-pa

Further evidence which can be cited in favour the present analysis of verbs and TH comes from reduplicated verb forms. Although the behaviour of TH in reduplication is complex (§3.4.3), recall that TH /c/ does appear after both copies of a reduplicated verb stem, as illustrated in (3.48a). Given that all other reduplication in Kayardild involves entire morphs, or multiple morphs, this suggests strongly that TH is either (i) part of the verb stem, or (ii) an extra morph after the verb stem which is reduplicated with it, but not (iii) part of the verb suffix (since the suffix as a whole is not reduplicated). Indeed, even if it were proposed that verb reduplication is special, and that what is copied is the stem (which lacks TH) plus the first consonant of the suffix (of which TH is a part), the evidence suggests otherwise. In (3.48b) the suffix begins with /n/, yet the first copy of the reduplicated unit still ends with TH /c/.

(3.48)	a.	*budii-j~budii-j-u-*	b.	*budii-j~budii--n-da*
		puti:cputi:cuu		puti:cputi:nta
		puti:-c-puti:-c-kuu-ø		puti:-c-puti:-c-n-ta
		run away-TH-run away-TH-fPROP-T		run away-TH-run away-TH-fN-T
		run away-Ø-run away-Ø-POT-Ø		run away-Ø-run away-Ø-CONT-Ø

In short, there is strong evidence that the thematic TH is part of the verb stem: an anaylsis which assume this to be so (i) dispenses with a significant amount of allomorphy in suffixes; (ii) dispenses with abstract verb conjugations; (iii) provides a better account of verbal reduplication; and (iv) relates observed instances of alternating and non-alternating surface forms to other phonological facts of the language.

3.9 Personal pronominal stems

This section details the forms of the three series of personal pronominal stems in §3.9.1 and the use of pronominal stems with fSAME in §3.9.2. A novel observation regarding the avoidance of using CASE:genitive inflected forms of pronominal stems is made in §3.9.3.

3.9.1 Stem forms

Kayardild possesses three series of personal pronominal stems, referred to here as **basic**, **possessive** and **complementised**.

The basic series is used as the stem when no inflectional features are associated with the word;[22] the complementised series (corresponding to Evans' (1995a) 'subject oblique' series) is used when the feature COMPLEMENTISATION:plain is associated with the word. The possessive series is used in all other inflectional contexts, and also serves (i) as the possessive stem and (ii) as the pronominal stem used in compounds (cf §3.12.5). On reduplication of the possessive pronoun, see §3.12.1.

Stems, and their analysis into component morphs are shown in (3.49). Vowels in parentheses are optional. The formal possessive and complementisation morphs (fPOSS, fCOMP) /paɲ/, /pa/ undergo 'leniting' phonology, and the initial /i/ of fINY /iɲ/ forces the deletion of a preceding, underlying /u/ vowel. See §3.13.4 regarding the possible analysis of fPOSS /paɲ/ as fCONT /pa/ + fINY /iɲ/. Discussion continues below.

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[22] Also when the word is associated solely with the COMP:empathy feature, cf Ch.6, §6.5.1.

(3.49) Basic, possessive and complementised pronominal stems and their analysis

Basic		Possessive		Complementised	
1s	ŋat̪- ŋat̪-	1s-fINY	ŋiciɲ- ŋicu-iɲ-	1s-fCOMP	ŋicuwa- ŋicu-pa-
1-d	ŋar- ŋa-r-	1-d-fPOSS	ŋar(a)waɲ- ŋa-r(a)-paɲ-	1-d-fCOMP	ŋar(a)wa- ŋa-r(a)-pa-
1-p	ŋal- ŋa-l-	1-p-fPOSS	ŋal(a)waɲ- ŋa-l(a)-paɲ-	1-p-fCOMP	ŋalawa- ŋa-la-pa-
1-2-d	ŋakur- ŋa-ku-r-	1-2-d-fPOSS	ŋakurwaɲ- ŋa-ku-r-paɲ-		
1-2-p	ŋakul- ŋa-ku-l-	1-2-p-fPOSS	ŋakul(u)waɲ- ŋa-ku-l(u)-paɲ-		
1-2- non-sg		1-2-fINY	ŋakiɲ- ŋa-ku-iɲ-		
2s	ɲiŋ- ɲiŋ-	2s-fPOSS	ŋumpaɲ- ŋuŋ-paɲ-	2s-fCOMP	ŋumpa- ŋuŋ-pa-
2-d	kir- ki-r-	2-d-fPOSS	kirwaɲ- ki-r-paɲ-	2-d-fCOMP	kirwa- ki-r-pa-
2-p	kil- ki-l-	2-p-fPOSS	kil(u)waɲ- ki-l(u)-paɲ-	2-d-fCOMP	kiluwa- ki-lu-pa-
3s	ŋi̥- ŋi̥-	3s-fPOSS	ŋi̥waɲ- ŋi̥-paɲ-	3s-fCOMP	ŋi̥wa- ŋi̥-pa-
2-d	pir- pi-r-	2-d-fPOSS	pirwaɲ- pi-r-paɲ-	2-d-fCOMP	pirwa- pi-r-pa-
2-p	pil- pi-l-	2-p-fPOSS	pil(u)waɲ- pi-l(u)-paɲ-	2-d-fCOMP	piluwa- pi-lu-pa-

Pronominal stems contrast first, second and third person, and singular, dual and plural number. In the dual and plural of the basic and possessive series, a contrast exists between ‘exclusive’ (i.e., 1-d, 1-p) and ‘inclusive’ (1-2-d, 1-2-p). A special non-singular inclusive form exists solely in the possessive series.

For each person category in each series, the singular root differs from a common, non-singular root. In the first and second person the singular root also differs between the basic series on the one hand and the possessive and complementised series on the other. Person/number roots are summarised in (3.50).

(3.50) Person/number roots

	Singular		Non-singular
	Basic	Other	
1	ŋat̪	ŋicu	ŋa
1-2			ŋa-ku
2	ɲiŋ	ŋuŋ	ki
3	ŋi̥		pi

Non-singular number categories are marked by /r ~ ra ~ ru/ (dual) or /l ~ la ~ lu/ (plural).

In the possessive series, the usual formal possessive (fPOSS) morph /paɲ/ fails to appear in the 1s and 1-2-nonsg stem, with fINY /iɲ/ appearing in its place (on fINY, see §3.13.4).

3.9.2 Pronominal stems and fSAME

Turning to other matters, the basic and possessive pronominal series may be followed by the fSAME suffix, creating a stem meaning 'PRO its-/his-/herself'. As usual, the basic stem is used in the absence of inflectional features and the possessive stem otherwise. Examples of such stems are shown in (3.51) and actual words in (3.52). Third person stems followed by fSAME also have the idiosyncratic meaning 'the same' (3.53) and the 3s-fSAME form can function as determiner (3.53b).

(3.51) Examples of attachment of fSAME to person pronouns

	Basic	Possessive
1s	ŋat̪ic-	ɲicinic-
	ŋat̪-ic	ɲicu-iɲ-ic
	1sg-fSAME	1sg-fINY-fSAME
3s	ɳiːc-	ɳiwanic-
	ɳi-ic	ɳi-paɲ-ic
	3sg-fSAME	3sg-fPOSS-fSAME

(3.52) a. *ngath-i-da*
ŋat̪-ic-ta
1sg-fSAME-T
1sg-SAME-ø
'I myself'

b. *nying-i-da*
ɲiŋ-ic-ta
2sg-fSAME-T
2sg-SAME-ø
'you yourself'

(3.53) a. *bi-l-i-da*
pi-l-ic-ta
3-pl-fSAME-T
3-pl-SAME-ø
'the same' (PL)

b. [$_{DP}$ *ni-wan-ij-iy-a* *yubu-yubu-y-a*]
ɳi-paɲ-ic-ki-a jupu-jupu-ki-a
3sg-fPOSS-fSAME-fLOC-T ‹road$_{NL}$-road$_{NL}$›-fLOC-T
3sg-ø-SAME-INS-ø ‹road›-INS-ø
'on the same road (A-TAM:instantiated)'

3.9.3 Apparent lack of CASE:genitive inflection of pronominal stems

In the two languages most closely related to Kayardild, the genitive CASE inflection of pronominal stems contains the usual, possessive stem followed by the formal genitive ligative (fGENLIG) suffix (on which, cf §3.13.8) and the formal genitive proper (fGEN). An example from Yangkaal (Hale 1960) is shown in (3.54); the facts in Yukulta (Keen 1972; Keen 1983) are comparable.

(3.54)	[$_{DP}$ ***ngijin-ba-karra***	*ngamathu-karra* $_{GEN}$]	*dangkaa.*
Yangkaal	ŋiciɲ-pa-kara	ŋamaṯu-kara	ṯaŋka-a
	1sg.fPOSS-fGENLIG-fGEN.T	mother-fGEN.T	person-T
	1sg.POSS-Ø-GEN	mother-GEN	person-Ø
	‘my mother’s people’ [Hale 1940, p4]		

In Kayardild I have just three recorded instances of DPs in which one would expect, all things equal, to find a pronominal stem inflected for CASE:genitive in the same manner. What is found though appears to be a single word composed of a compounded pronominal stem and kin term. All three examples are uttered by the same speaker, and all contain the kin term *thabuju* ‘elder brother’. Two are shown in (3.55).

(3.55)	a.	***Ngij-in****-thabuju-karra*	*maku-.*	b.	***Ni-wan****-thabuju-karra*	*wuman-.*
		ŋicu-iɲ-ṯapucu-kara	maku-a		ŋi-waɲ-ṯapucu-kara	wumana
		1sg-fINY-e.Br-fGEN.T	wife-T		3sg-fPOSS-e.Br-fGEN.T	wife.T
		1sg-POSS-e.Br-GEN	wife-Ø		3sg-POSS-e.Br-GEN	wife
		‘My elder brother’s wife.’			‘His elder brother’s wife.’	
		[R2005-jun05b]			[R2005-jun29]	

Other determiners are free to inflect for CASE:genitive, as illustrated in (3.56).

(3.56)	***Dathin-ba-karr***	*kiyarr-ba-karr*	*dangka-karr*
	ṯaṯin-pa-kara	ḵiarŋ-pa-kara	ṯaŋka-kara
	that-fGENLIG-fGEN.T	two-fGENLIG-fGEN.T	man-fGEN.T
	that-Ø-GEN	two-Ø-GEN	man-GEN
	kuna~wun	*kurrka-th!*	
	kuna-kuna-ø	kurka-ṯa	
	‹child$_{NL}$-child$_{NL}$›-T	take-TH.T	
	‹child›-Ø	take-IMP	
	‘Take those two men’s children!’ [W1960]		

3.10 Compass locational stems

Like many Australian languages, Kayardild possesses a rich set of derived stems based on roots denoting the four cardinal compass points. This section provides example analyses of those stems. For a comprehensive coverage of such stems in Kayardild see Evans (1995a:206–27); table (3.57) at the end of this section relates morph glosses used here to the morpheme labels used by Evans.

In many cases, stems contain allomorphy which is old, in some cases tracing back to proto Tangkic. Here, stems will be analysed only insofar as they can be accounted for in terms of regular roots or suffixes, and in terms phonological modifications attested elsewhere in the language. Table (3.57) sets out the four cardinal roots and what can be described as 'first order' derived stems. First order stems will each serve as the base of several other 'second order' stems below.

(3.57) Cardinal roots and 'first order' derived stems, and their analysis

	North	South	East	West
ROOT	cirkaɻa-	ɹa-	ɻi-	pat̪-
ALLATIVE	cirkuɻuŋ-	ɹaɻuŋ-	ɻiluŋ-	paluŋ-
		ɹa-ɻuŋ		pat̪-ɻuŋ-
	north.fALL	south-fALL	east.fALL	west-fALL
ABLATIVE	cirkaan-	ɹain-	ɻiːn-	pat̪in-
		ɹa-in-	ɻi-in-	pat̪-in-
	north.fFRM	south-fFRM	east-fFRM	west-fFRM
LOCATIVE	cirkaɻi	ɹaɻi-	ɻia-	pat̪i-
		ɹaɻ-ki-		pat̪-ki
	north.fLOC	south-fLOC	east.fLOC	west-fLOC

Table (3.58) shows additional stems based directly on cardinal roots.

(3.58) Additional stems based directly on cardinal roots

	North	South	East	West
a.	cirkarŋa-~cirkurŋa-	ɻaŋurŋa- ɻa-ŋurŋa-	ɻiŋurŋa- ɻi-ŋurŋa-	pat̪urŋa- pat̪-ŋurŋa-
	N.fBOUND	S-fBOUND	E-fBOUND	W-fBOUND
b.	cirkaɽawat̪- cirkaɽa-wa-t̪- N-fINCH-TH	ɻawat̪- ɻa-wa-t̪- S-fINCH-TH	ɻiwat̪- ɻi-wa-t̪- E.fINCH-TH	pajat̪- pat̪-wa-t̪- W-fINCH-TH
c.	ŋanikincirkaɽa- ŋanikin-cirkaɽa- fYON-N	ŋanikilaː- ŋanikin-ɻaː- fYON-S	ŋanikili- ŋanikin-ɻi- fYON-E	ŋanikinpat̪- ŋanikin-pat̪- fYON-W
d.	cirkaɽamali- cirkaɽa-mali- N-fHAIL	ɻamali- ɻa-mali- S-fHAIL	ɻimali- ɻi-mali- E-fHAIL	panmali- pat̪-mali- W-fHAIL

Table (3.59) shows second order stems based on the allative stem. Line (3.59d) illustrates a kind of compound comprised of the allative stem plus a body part, meaning ‘having one’s BODY-PART facing N/S/E/W’. Attested body parts used in such compounds are *bardaka-* /paɽaka-/ ‘belly’, *kirrk-* /kirk/ ‘nose’, *kurndung-* /kuɳʈuŋ/ ‘chest’, *mibur-* /mipuɻ/ ‘eye’, *thukan-* /t̪ukan-/ ‘beard’ and *wara-* /waɽa/ ‘beak’.

(3.59) Second order stems based on the allative stem

	North	South	East	West
a.	cirkuɻumpaɲ cirkuɻuŋ-paɲ N.fALL-fPOSS	ɹaɻumpaɲ ɹa-ɻuŋ-paɲ S-fALL-fPOSS	ɹilumpaɲ ɹiluŋ-paɲ E.fALL-fPOSS	palumpaɲ pat̪-ɻuŋ-paɲ W-fALL-fPOSS
b.	cirkuɻiːc cirkuɻuŋ-iːc N.fALL-fCONT	ɹaɻiːc ɹa-ɻuŋ-iːc S-fALL-fCONT	ɹiliːc ɹiluŋ-iːc E.fALL-fCONT	paliːc pat̪-ɻuŋ-iːc W-fALL-fCONT
c.	cirkuɻicat̪- cirkuɻuŋ-ic-wa-t̪- N.fALL-fSAME-fINCH-TH	ɹaɻicat̪- ɹa-ɻuŋ-ic-wa-t̪- S-fALL-fSAME-fINCH-TH	ɹilicat̪- ɹiluŋ-ic-wa-t̪- E.fALL-fSAME-fINCH-TH	palicat̪- pat̪-ɻuŋ-ic-wa-t̪- W-fALL-fSAME-fINCH-TH
d.	cirkuɻiculut̪- cirkuɻuŋ-ic-ulu-t̪- N.fALL-fSAME-fMOV-TH	ɹaɻiculut̪- ɹa-ɻuŋ-ic-ulu-t̪- S-fALL-fSAME-fMOV-TH	ɹiliculut̪- ɹiluŋ-ic-ulu-t̪- E.fALL-fSAME-fMOV-TH	paliculut̪- pat̪-ɻuŋ-ic-ulu-t̪- W-fALL-fSAME-fMOV-TH
e.	cirkuɻupaʈaka cirkuɻuŋ-paʈaka N.fALL-belly	ɹaɻupaʈaka ɹa-ɻuŋ-paʈaka S-fALL-belly	ɹilupaʈaka ɹiluŋ-paʈaka E.fALL-belly	palupaʈaka pat̪-ɻuŋ-paʈaka W-fALL-belly

Table (3.60) shows second order stems based on the ablative stem. The empty cell in line (3.60a) corresponds to an unattested form.

(3.60) Second order stems based on the ablative stem

	North	South	East	West
a.		ɻainic- ɻa-in-ic- S-fFRM-fSAME	ɻiːnic- ɻi-in-ic- E-fFRM-fSAME	pat̪inic- pat̪-in-ic- W-fFRM-fSAME
b.	cirkaaniːc- cirkaan-iːc- N.fFRM-fCONT	ɻainiːc- ɻa-in-iːc- S-fFRM-fCONT	ɻiːniːc- ɻi-in-iːc- E-fFRM-fCONT	pat̪iniːc- pat̪-in-iːc- W-fFRM-fCONT
c.	cirkaanmali- cirkaan-mali- N.fFRM-fHAIL	ɻainmali- ɻa-in-mali- S-fFRM-fHAIL	ɻiːnmali- ɻi-in-mali- E-fFRM-fHAIL	pat̪inmali- pat̪-in-mali- W-fFRM-fHAIL
d.	cirkaankiɻic- cirkaan-ki-ɻiŋ-ic- N.fFRM-fLOC- fALL-fSAME	ɻainkiɻic- ɻa-in-ki-ɻiŋ-ic- S-fFRM-fLOC- fALL-fSAME	ɻiːnkiɻic- ɻi-in-ki-ɻiŋ-ic- E- fFRM-fLOC- fALL-fSAME	pat̪inkiɻic- pat̪-in-ki-ɻiŋ-ic- W-fFRM-fLOC- fALL-fSAME

Table (3.61) shows second order stems based on the locative stem, and table (3.62) lists correspondences between the glosses used in this section and the labelling of forms in Evans (1995a).

(3.61) Second order stems based on the locative stem

	North	South	East	West
a.	cirkaɻic- cirkaɻi-c- N.fLOC-fREM	ɻaɻic- ɻaɻ-ki-c- S-fLOC-fREM	ɻiat̪- ɻia-t̪- E.fLOC-fREM	
b.		ɻaɻici ɻaɻ-ki-t̪-ki S-fLOC-fREM- fLOC	ɻiat̪i ɻia-t̪-ki E.fLOC-fREM- fLOC	pat̪ici pat̪-ki-t̪-ki W-fLOC-fREM- fLOC
c.	cirkaɻiɲin cirkaɻi-iɲin- N.fLOC-fEND	ɻaɻiɲin ɻaɻ-ki-iɲin- S-fLOC-fEND	ɻiaɲin- ɻia-iɲin- E.fLOC-fEND	pat̪iɲin- pat̪-ki-iɲin- W-fLOC-fEND

(3.62)

Here	Evans (1995a)
Allative stem (root+fALL)	Allative stem
Ablative stem (root+fFRM)	‘From’ stem
Locative stem (root+fLOC)	(not identified)
Root+fBOUND	Boundary
Root+fINCH-TH	(not specifically labeled)
fYON+Root	Yonder
Root+fHAIL	Hail
Allative stem+fPOSS	Origin
Allative stem+fCONT	Continuous
Allative stem+fSAME-fINCH-TH	Turn
Allative stem+fSAME-fMOV-TH	Move to
Ablative stem+fSAME	Remote
Ablative stem+fCONT	(not mentioned)
Ablative stem+fHAIL	Hail
Ablative stem+fLOC-fALL-fSAME	Centripetal boundary
Locative stem+fREM	(not mentioned)
Locative stem+fREM+fLOC	Remote
Locative stem+fEND	End

3.11 Phonological enclitics

Phonological enclitics are suffixes which attach not to a stem but to a complete syntactic word, with which they cohere phonologically. Kayardild possesses three such enclitics: *na* /ɳaː/ ‘now’; and the fSAME and fANOTH morphs /ic/ and /jarat̪/. The key facts which separate enclitics from suffixes are (i) that the material which they follow ends with the termination T, which always and only appears at the end of a syntactic word; and (ii) even though the enclitics are not inflectional, they appear after inflectional suffixes in the preceding word. The morphological and segmental-phonological facts relevant to enclitics are introduced in §§3.11.1–3.11.2 below; on the prosodic integration of enclitics see Ch.5 §5.3.8.4.

3.11.1 Enclitic *na* ‘now’

Enclitic *na* /ŋ̪a/ ‘now’ appears after all inflection and the termination T of the preceding word. Examples are shown in (3.63); the clitic boundary is written ‘=’.

(3.63)
a. *ngij-in-jiy-a=rna-*
ŋicu-iɲ-ki-a=ŋ̪a-a
1sg-fPOSS-fLOC-T=now-T
‘1sg-Ø-EMP-Ø=now-Ø’
[R2006-jul19a]

b. *ngudi-ja=rna-*
ŋuti-ca=ŋ̪a-a
throw-TH.T=now-T
‘throw-ACT=now-Ø’
[R2006-jul19a]

3.11.2 Clitic and non-clitic use of fSAME and fANOTH

The suffixal morphs formal same (fSAME) and formal another (fANOTH) usually function as derivational suffixes but occasionally pattern as phonological clitics. As suffixes, fSAME and fANOTH appear to the immediate right of a nominal base. The stem formed can then be inflected, or followed directly by the termination T, as illustrated in (3.64).

(3.64)
a. *darirr-ij-iy-a*
t̪aɻir-ic-ki-a
infant-fSAME-fLOC-T
‘infant-SAME-EMP-Ø,
i.e., still an infant!’
[R2006-jul21]

b. *ngarrku--da*
ŋarku-ic-ta
strong-fSAME-T
‘strong-SAME-Ø,
i.e., still strong’
[E392.ex.9-318]

c. *marrkathu-yarrath-i-naa-*
markat̪u-jarat̪-ki-naa-ø
aunt-fANOTH-fLOC-fABL-T
‘aunt-ANOTH-Ø-ABL-Ø,
i.e., of another aunt’
[R2006-aug21]

d. *diyaa--n-kuru-yarra-da*
t̪ia-i-c-n-kuɻu-jarat̪-ta
eat-fMID-TH-fN-fPROP-fANOTH-T
‘eat-MID-Ø-N-PROP-ANOTH-Ø,
i.e., another edible one’
[R2005-jul08]

Occasionally though, fSAME and fANOTH stand to the right of an entire word, either nominal (in the case of fSAME) or verbal (both fSAME and fANOTH), as shown in (3.65).

(3.65) a. *wululbu-y-a=-da*[23]
wululpu-ki-a=ic-ta
bait-fLOC-T=fSAME-T
'bait-LOC-Ø=SAME-Ø,
i.e., still at the bait'
[E390]

b. *mardalk-inja=-d*
maʈalk-in̪t̪a-ø=ic-ta
mud-fOBL-T=fSAME-T
'mud-COMP-Ø=SAME-Ø,
i.e., all through the mud (COMP)'
[R2005-jul21]

c. *wirdi-ja=-da*
wiʈi-ca=ic-ta
stay-TH.T=fSAME-T
'stay-ACT=SAME-Ø,
i.e., still remaining'
[R2006-aug10]

d. *ngaka-th-uu-=-da*
ŋaka-t̪-kuu-ø=ic-ta
wait-TH-fPROP-T=fSAME-T
'wait-ø-POT-ø=SAME-Ø,
i.e., wait a long time yet'
[E392.ex.9-319]

e. *bama-tha=yarra-d*
pama-t̪a=jarat̪-ta
stay-TH.T=fANOTH-T
'smell-ACT=ANOTH-Ø,
i.e., smell OBJ again'
[E288.ex.7-74]

f. *jirrma-j-a=yarra-d*
cirma-ca=jarat̪-ta
lift-TH.T=fANOTH-T
'lift-ACT=ANOTH-Ø,
i.e., lift OBJ too'
[E289.ex.7-76]

Somewhat incongruously, fSAME is also attested appearing outside of inflectional suffixes but within the syntactic word (according to the diagnostic that it is not preceded by T), as in (3.66):

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[23] Note that this construction contrasts with the derivational, 'perlative' use of fLOC-fSAME (cf §3.12.8) as in *yubuyubuyida* /jupu-jupu-ki-ic-ta/ 'road$_{NL}$-road$_{NL}$-fLOC-fSAME-T, i.e., along the road' — in the latter, there is no T between the fLOC and fSAME morphs.

(3.66) a. *marraa-j-arri--d*
mara-c-wari-ic-ta
show-TH-fPRIV-fSAME-T
'show-Ø-NEG.ACT-SAME-Ø,
i.e., still hasn't shown'
[R2006-aug11]

b. *kalarr-uru--d*
kalarr-kuɻu-ic-ta
clearing-fPROP-fSAME-T
'clearing-FUT-SAME-Ø,
i.e., in the clearing (FUT)'
[W1960]

3.12 Sundry issues regarding roots, stems and suffixes

This section examines issues regarding /CV/ nominal root allomorphy in §3.12.1, and regarding certain /CVC/ roots in §3.12.2, irregular suffixed forms of three stems in §3.12.3, reduplication of complex stems in §3.12.4, selection of bases by stems in §3.12.5, the formal overlap between derivational and inflectional suffixes in §3.12.6, removable final morphs in complex stems in §3.12.7 and compound suffixes in §3.12.8.

3.12.1 Alternations in /CV/ roots, and the increment INC

This section discusses alternations in roots of the shape /Ca/ (§3.12.1.1) and /Cu/ (§3.12.1.2), and introduces the 'increment' (INC) /ɻ/, which is also found in one disyllabic root (§3.12.1.3).

3.12.1.1 Alternations in /Ca/ roots

There are three roots with the shape /Ca/, listed in (3.67). Each has an allomorph /Caɻ/ and *ra-* 'south' has an allomorph /ɻaa/.

(3.67)

Gloss	Root allomorphs		
‘foot’	ca,	ca-ɻ	
‘rain’	ca,	ca-ɻ	
‘south’	ɻa,	ɻa-ɻ,	ɻaa

For reasons which will become clear over the next three sections, it will be appropriate to treat the /Caɻ/ allomorphs as complex, being comprised of the basic root /Ca/ plus an ‘increment’ (INC) /ɻ/. This INC has its own cumulative morph with the termination: INC.T is /ɻa/.

Table (3.68) shows /Ca/ roots used on their own as stems. As can be seen, both the incremented and unincremented root are used.[24] By way of comparison, note that a normal /Caɻ/ root like /maɻ/ ‘hand’ does not pattern the same as a /Ca/ root plus the increment.

(3.68) /Ca/ roots used as stems, +T

Gloss	Root	Used as stem, +T			
‘foot’	ca	ca-ɻa	‘foot-INC.T’	~ ca-a	‘foot-T’
‘rain’	ca	ca-ɻa	‘rain-INC.T’	~ ca-a	‘rain-T’
‘south’	ɻa	ɻa-ɻa	‘south-INC.T’	~ ɻa-a	‘south-T’
‘hand’	maɻ	maɻ-ta	‘hand-T’		

Generally speaking, senior speakers in my corpus do not use the incremented root in inflected forms or in compounds, as shown in (3.69b–f) below. Younger speakers on the

[24] Evans (1995a:124) characterises individual speakers as using either exclusively the unincremented or the incremented forms. The relevant data I have is scanty, but one speaker is recorded using both unincremented /ca-a/ ‘foot-T’ and incremented /ɻa-ɻa/ ‘south-AUG.T’.

other hand use the increment form quite widely as an alternative to the basic root, as illustrated in (3.69g). My one token of a senior speaker using incremented /ca-ɻ̯/ 'foot-INC' in this way occurs when the senior speaker immediately repeats the inflected form (3.69a) that has just been uttered by a younger speaker.

(3.69)	a.	*ja-r-marra-* ca-ɻ̯-mara-ø foot-INC-fUTIL-T 'foot-ø-UTIL-ø'	b.	*ja-wuu-* ca-kuu-ø foot-fPROP-T 'foot-FUT-ø'	c.	*ja-muthan-d* ca-mut̪aɲ-ta foot-fEXS-T 'excessive wanderer'
	e.	*ja-thungal-uru-a* ca-t̪uŋal-kuɻ̯u-a foot-thing-fPROP-T 'having something on his feet'	f.	*ja-thaldi--n-da* ca-t̪alti-c-n-ta rain-stand-TH-fN-T 'steady rain'	g.	*ja-r-murndu-* ca-ɻ̯-muɳʈu-a foot-INC-crooked-fPROP-T 'pigeon-toed' (by a younger speaker)
	h.	*ra-wa-tha* ɻ̯a-wa-t̪a south-fINCH-TH.T 'move south-ACT'	i.	*ra-wuu-* ɻ̯a-kuu-ø south-fPROP-T 'south-FUT-ø'		

Although the phonology of /V+i/ sequences clouds the picture a little (see Ch.4 §4.4 for details), /Ca/ roots followed by /i/-initial suffixes are also regular and unincremented in all cases in my corpus uttered by senior speakers, as shown in (3.70a–f). Evans (1995a:124) reports incremented variants and a different unincremented fOBL form, as shown in (3.70g,h).

(3.70)	a.	*jaa-nj-* caːɲca ca-in̪t̪a foot-fOBL-T ‘foot-CONT-ø’	b.	*ja-yarrng-k* cajarŋka ca-kiarŋ-ka foot-fDU-T ‘two feet’	c.	*ja-ya* caja ca-ki-a foot-fLOC-T ‘foot-INS-ø’
	d.	*raa--ri* ɻaːɻ̣i ɻa-ki-ɻ̣i south-fLOC-fALL.T ‘south-ø-DIR’	e.	*jaa--ring-ki-naa-* caːɻ̣iŋkinaa ca-ki-ɻ̣iŋ-ki-naa-ø foot-fLOC-fALL-fLOC-fABL-T ‘foot-ø-DIR-ø-PRIOR-ø’	f.	*ra-yin-* ɻain ɻa-in south-fFRM- ‘from the south’
	g.	*ja-r-inj-* caɻ̣iɲca ca-ɻ̣-in̪t̪a foot-INC-fOBL-T	h.	*ja-yinj-* caiɲca ca-in̪t̪a foot-fOBL-T		

The root /ɻa/ ‘south’ exhibits two additional idiosyncrasies. In a compound after /ŋanikin/ ‘yonder’, the ‘south’ root appears with a long (or double) vowel, as /ɻaa/, as shown in (3.71a,b). Also, the increment arguably appears in the (derivational) locative stem of the ‘south’ root, as shown in (3.71c).

(3.71)	a.	*nganiki-laa-* ŋanikin-ɻaa-ø fYON-south-T ‘yonder south’	b.	*nganiki-laa-rung-k* ŋanikin-ɻaa-ɻ̣uŋ-ka fYON-south-fALL-T ‘yonder to the south’	c.	*ra-r-i* ɻa-ɻ̣-ki south-INC-fLOC south (‘locative’ stem)

3.12.1.2 Alternations in a /Cu/ root

There is one /Cu/ root, *ru-* /ɻu/ 'fat' with allomorphy similar to that of *ja-* and *ra-* above.[25] Data relevant to /ɻu/ is limited. Used on its own as a stem and uninflected, the root has only ever been attested as incremented /ɻu-ɻa/, never */ɻuː/ or */ɻua/, as shown in (3.72). Note that /ɻu/ patterns differently to a /Cuɭ/ stem such as /ʈuɭ/ 'faeces'.

(3.72) /ɻu/ used a stem, +T

Gloss	Root	Used as stem, +T		
'fat'	ɻu	ɻu-ɻa	'fact-INC.T'	*~ɻu-a, *~ɻuː
'faeces'	ʈuɭ	ʈuɭ-ta	'faeces-T'	

All attested inflected forms of /ɻu/ are shown in (3.73) (all are uttered by senior speakers). Compared to /Ca/ roots, it can be seen that the increment is used more often with /ɻu/.

(3.73)

	a.	b.	c.
	ru-r-i-	*ruruṛu-*	*ru-marr-*
	ɻu-ɭ-ki-a	ɻu-ɭ-kuɻu-	ɻu-mara-
	fat-INC-fLOC-T	fat-INC-fPROP-T	fat-fUTIL-T
	'fat-Ø-INS-Ø'	'fat-PROP-Ø'	'fat-UTIL-Ø'

[25] Another root, *duu-* 'anus' is presumably underlyingly /ʈuu/. It does not occur with INC when functioning as a stem (i.e., one does not find */ʈuɻa/). I have no information on its inflection (my consultants politely avoided using the word when I asked about it), but it appears in one compound recorded by Evans, with a long (or double) vowel: *duungambu-ngambu* /ʈuu-ŋampu-ŋampu-/ 'flatulent, lit. anus-well-well'.

3.12.1.3 *A disyllabic, incremented root*

In §3.12.1.1 and §3.12.1.2 we saw monosyllabic roots of the shape /Ca/ and /Cu/ being followed by the increment (INC) /ɻ/ which possesses a cumulative allomorph with T, /ɻa/. A single polysyllabic root in Kayardild can also be analysed as ending in the increment. The attested forms of *jingka-r-* /ciŋka-ɻ/ 'scrub-INC' are shown in (3.74a,c–f). In this case, the increment always appears with the root. For comparison, a normal root ending in /ɻ/ is shown in (3.74b).

(3.74)	a.	*jingka-ra* ciŋka-ɻa scrub-INC.T 'scrub-ø'	b.	*dawarl-da* ʈawaɻ-ta tree sp.-T 'tree sp.-ø'	c.	*jingka-r-maru-th-uu-* ciŋka-ɻ-maɻu-t̪-kuu-ø scrub-INC-fDAT-TH-fPROP-T 'scrub-ø-DAT-ø-POT-ø'
	d.	*jingka-r-i-* ciŋka-ɻ-ki-a scrub-INC-fLOC-T 'scrub-ø-LOC-ø'	e.	*jingka-r-nguni-* ciŋka-ɻ-ŋuni-a scrub-INC-fINST-T 'scrub-ø-INST'		*jingka-r-ii-wa-tha* ciŋka-ɻ-kiːwa-t̪a scrub-INC-‹fLLOC-fINCH›-TH.T 'scrub-ø-‹COLL›-ACT'

3.12.2 The phonology of CVŋ and CVt̪ roots

In most cases, the phonological behaviour of a morph which ends in a given phonological string *s*, will be determined by *s*. In the case of /CVC/ nominal roots ending in /ŋ/ and /t̪/ though, the phonology of the roots differs from that of all other morphs — both longer roots, and all suffixes — which end in the same consonant. In both cases, the behaviour of the /CVC/ root is unusual, in that it undergoes modifications from the leniting phonology in cases where other morphs with the same final consonant would undergo modifications from the regular phonology — this is true without exception for the one /CVŋ/ root, /kaŋ/ 'speech', and true to an extent which is not entirely clear for /CVt̪/

roots. Below, §3.12.2.1 details the facts related to /CVt̪/ roots, and §3.12.2.2 argues for the analysis just described.

3.12.2.1 CVt̪ roots

Entries in Evans' dictionary (1992:27,176) reveal an interesting variation in the treatment of underlying /t̪+m/ strings in a number of morphologically complex lexical stems in Kayardild, shown in (3.75). The surface cluster varies between /nm/ and /ɲm/, the key difference being whether laminal dental /t̪/ at the end of a /CVC/ root undergoes regressive nasalisation to apical /n/ or to laminal palatal /ɲ/.

(3.75)	a.	*buny-maru-tha*	b.	*buny-murra-tha*	c.	*yany-maru-tha*
		~bun-maru-tha		*~bun-murra-tha*		*~yan-maru-tha*[26]
		put̪-maɻu-t̪a		put̪-mura-t̪a		jat̪-maɻu-t̪a
		behind-fDAT-TH.T		behind-break-TH.T		laugh-fDAT-TH.T
		'come behind OBJ'		'inherit (OBJ=widow)'		'make OBJ laugh'

In other cases Evans records only /nm/ (1992:7), and my own records concur:

(3.76)	a.	*ban-maru-tha*	b.	*ban-mali-*
		**~bany-maru-tha*		**~bany-mali-*
		pat̪-maɻu-t̪a		pat̪-mali
		west-fDAT-TH.T		west-fHAIL-
		'put OBJ to the west'		'hey you in the west'

[26] The form *yanmarutha* is not given in Evans (1992) but occurs in my own corpus uttered by two different speakers.

Evans' (1995a) phonology chapter does not comment specifically on how /CVt̪/ roots combine with other morphs, and although a nominal inflectional paradigm (1995a:126) contains the form (3.77a), it also contains (3.77b), which I suspect is based on forms produced not by senior speakers, but by younger speakers — on the suspicious cluster /ɲŋ/ see Ch.2, §2.4.2.

(3.77) a. *?niny-marra-*
ŋit̪-mara-
name-fUTIL-
'name-UTIL'

b. *?niny-nguni-*
ŋit̪-ŋuni-
name-fINST-
'name-INST'

In the field I was able to obtain from one senior speaker two inflections of a /CVt̪/ root in which /t̪/ undergoes regressive nasalisation, shown in (3.78). In both cases, /t̪+ŋ/ is realised on the surface as /nŋ/.

(3.78) a. *bin-ngarrba-*
pit̪-ŋarpa-
smell-fCONS-
'smell-CONS'

b. *bin-nguni-*
pit̪-ŋuni-
smell-fINST-
'smell-INST'

Comparing the forms in (3.78) with those in (3.79), where /t̪+ŋ/, /c+ŋ/ → /ɲ/, we see that at least for this one speaker, /CVt̪/ roots inflect differently from longer /t̪/-final roots, and to /c/-final roots both short and long.

(3.79)	a.	*yarbu-nyarrba-*	b.	*ngi-nyuni-*	c.	*biriij-birii-nyarrba-*
		jaɻput̪-ŋarpa-		ŋic-ŋuni-		piɻiːc-piɻiːc-ŋarpa-
		animal-fCONS-		wood-fINST-		‹Fa-Fa›-fCONS-
		‘animal-CONS’		‘wood-INST’		‘fathers-DYAD’

Although the evidence available is limited, it can be summarised as follows. There appears to have existed variation of some kind in the realisation of /CVt̪/ roots before a following /m/ — in at least some cases, these /t̪+m/ sequences were realised differently to /c+m/ and differently to /t̪+m/ in which the /t̪/ was not part of a /CVC/ root. Likewise, in at least some cases, /t̪+ŋ/ sequences where /t̪/ was part of a /CVC/ root, were realised differently to /c+ŋ/ and differently to /t̪+ŋ/ in which the /t̪/ was not part of a /CVC/ root. Whether the variation was dialectal, or perhaps was some kind of intra-speaker variation, remains unclear.[27]

3.12.2.2 Analysis

The general approach adopted in the dissertation, in analysing the modifications which apply across boundaries between morphs m_1+m_2 is to sort those modifications into classes, such as the three classes which make up the ‘regular’, ‘deleting’ and ‘leniting’ phonologies. Generally, the factors which determine which class applies to a given pair m_1+m_2 are

[27] Whatever its synchronic status, the variation probably traces back to a variable sound change from *[CVn̪C] > [CVnC ~ CVɲC]. The same alternation between /n/ and /ɲ/ before C also turns up inside (apparently) monomorphemic lexical stems, e.g. *bun(y)ba-th-* ‘blow’, *kin(y)ba-th-* ‘call’. Modern Kayardild does not permit surface [n̪m] clusters, but Hale (1960c) records the existence of them in Kayardild’s closest relative, Yangkaal. See also Ch.2, §2.1.3.1 regarding other evidence for intervocalic *n̪ > n in Kayardild.

morphological, while the modifications themselves follow solely from phonological form. As we have seen, /CVŋ/ roots and at least some /CVt̪/ roots undergo different kinds of modifications from other /ŋ/-final and /t̪/-final morphs. The determinant in such cases is partially phonological — since what distinguishes these /CVC/ roots from other roots is their (phonological) shortness. On the other hand, it is also partly morphological, since what distinguishes /CVC/ roots from other /CVC/ morphs in general, is that they are roots. This then raises the question: should /CVŋ/ and /CVt̪/ roots be analysed as undergoing the *same* 'class' of regular, deleting, and leniting phonology as other /ŋ/- and /t̪/-finals, in which case a given 'class' of modifications will need to be sensitive to some morphological information (i.e., root versus non-root); or should /CVŋ/ and /CVt̪/ roots be assigned to a *different* 'class' of phonological modifications from other /ŋ/- and /t̪/-finals, in which case a 'class' of modifications can remain insensitive to morphological information, although the actual assignment to a given class of modifications will need to be sensitive to some phonological information (i.e., /CVC/ versus longer)? The empirical evidence favours the second analysis, as follows.

Where other m_1 morphs (within m_1+m_2) undergo modifications from the 'regular' phonology, which includes deletion of morph final /ŋ/, the root /kaŋ/ retains the /ŋ/. If we suppose that /kaŋ/ is undergoing the 'regular' class of modifications, then the 'regular' class will need to be made more complicated to accommodate this fact. On the other hand, m_1 morphs in the 'leniting' phonology retain their final /ŋ/. If we suppose that /kaŋ/ is undergoing the 'leniting' class of modifications, then the 'leniting' class does not become any more complicated than it was.

Likewise, in cases where other m_1 morphs (within m_1+m_2) undergo modifications from the 'regular' phonology, /CVt̪/ roots can behave differently from /CVc/ roots. However, it is otherwise the case that /t̪/-final and /c/-final m_1 morphs behave identically in the 'regular' phonology. If we suppose that /CVt̪/ roots are undergoing the 'regular' class of modifications, then the 'regular' class will need to be made more complicated. On the other hand in the 'leniting' phonology, m_1 morphs ending in /t̪/ and /c/ generally behave differently, not identically. If we suppose that /CVt̪/ roots can undergo the 'leniting' class of modifications, then the 'leniting' class does not become any more complicated than it was.

Accordingly, it will be assumed here that /CVŋ/ roots and at least some /CVt̪/ roots, as m_1 within m_1+m_2, force the selection of the 'leniting'[28] phonology where all else equal, one would expect the 'regular' phonology.

3.12.3 Irregular suffixed forms of stems

Three lexical stems have partially idiosyncratic suffixed forms, as documented by Evans (1995a:129,367,642) and shown in (3.80). In two cases, (3.80a,b), the idiosyncratic form appears in variation with a regular form.[29]

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[28] Other considerations rule out the possibility that they undergo modifications from the 'deleting' phonology — specifically, in m_1+m_2, /kaŋ+C.../ and /CVt̪+C.../ do not undergo the deletion of initial C of m_2 in the manner which is typical of the deleting phonology. In contrast, all modifications which they undergo conform to the general patterns of the 'leniting' phonology.

(3.80)		Plain stem	Idiosyncratic	Regular
	a.	*wuran-* wuɻan- food	*wurankarri-* wuɻankari- food.fPRIV	*wuran-marri-* wuɻan-wari- food-fPRIV
	b.	*balmbi-* palmpi- tomorrow	*balmbu-* palmpuu- tomorrow.fPROP-	*balmbi-wu-* palmpi-kuu- tomorrow-fPROP
	c.	*ngaaka-* ŋaːka- what	*ngaa-karrany-* ŋaːk-karaɲ what-fGEN-	**ngaaka-karrany-* ŋaːka-karaɲ- what-fGEN-
			ngaa-karra ŋaːk-kara what-fGEN.T	**ngaaka-karra* ŋaːka-kara- what-fGEN

In all three the cases there are strong similarities between the (attested or unattested) regular form and the idiosyncratic form. In (3.80a) the irregular form could be analysed in terms of an irregular fPRIV allomorph /kari/ which attaches to the normal stem, /wuɻan/. In the case of (3.80b), there is no irregular suffix which could attach to /palmpi/ to yield /palmpuu/ according principles of the phonological found elsewhere in Kayardild, and nor could /palmpuu/ result from any irregular stem attaching to fPROP /kuu/ — the irregular form will need to be listed whole. Finally, in the case of (3.80c) there is good reason to posit in irregular stem /ŋaː/ or /ŋaːk/[30] which appears before fGEN, given that the fGEN

[29] The form (3.80a) has an idiosyncratic meaning ‘hungry’, though I have also heard it used with the unambiguous meaning ‘food-less’, used in reference to a bush with no fruit.

[30] Incidentally, a stem /ŋaːk/ followed by T would yield surface /ŋaːka/ (from underlying /ŋaːk-ka/), homophonous with the regular stem /ŋaːka/ followed by T (from underlying /ŋaːka-ø/).

suffix within the irregular forms continues to exhibits its usual allomorphy between fGEN /karaɲ/, and the cumulative fGEN.T morph, /kara/.

3.12.4 Reduplication of complex stems

The reduplication of single nominal roots and of verbal roots and their thematics was covered above in §3.3.3 and §3.4.3. It is also possible in Kayardild to reduplicate polymorphemic units. In all attested cases, the phonological modifications which apply at the edge of the reduplicated units are those of the 'regular' phonology.

A reduplicated nominal compound is shown in (3.81a); reduplicated nominal stems consisting of a root plus one or more suffixes are shown in (3.81b,c), and (3.81d) shows a reduplicated possessive pronominal stem.

(3.81) a. *nal-birdi~nal-birdi-*
ŋal-piʈi-ŋal-piʈi-
‹head-bad›-‹head-bad›-
'very crazy'

b. *bardi-wuru~bardi-wuru-*
paʈi-kuɻu-paʈi-kuɻu-
‹whisker-fPROP›-‹whisker-fPROP›-
'old man'

c. *ra-rum-ba~la-rum-ban-*
ɻa-ɻuŋ-paɲ-ɻa-ɻuŋ-paɲ-
‹south-fALL-fPOSS›-‹south-fALL-fPOSS›-
'southerners'

d. *nga-ku-lu-wan~nga-ku-lu-wan-*
ŋa-ku-lu-paɲ-ŋa-ku-lu-paɲ-
‹1-2-pl-fPOSS›-‹1-2-pl-fPOSS›-
'our many'

When compounds ending in a thematic are reduplicated, the behaviour of thematics follows the same patterns set out in §3.4.3, though with one qualification. Thematic /c/ plus a following root initial /k/ undergo modifications corresponding to the 'deleting' phonology (yielding surface /c/) only if the following root is verbal (which it always was in §3.4.3); if the following root is nominal, modifications from the ‘regular’ phonology apply, yielding surface /k/. This is summarised in (3.82).

(3.82) Analysis adopted for reduplication of complex verbal STEM-TH

Stem initial C	Thematic	Template	Phonology
Sonorants	/t̪/ or /c/	STEM-TH-STEM-TH	regular
Plosives*	/c/	STEM-TH-STEM-TH	regular
Plosives	/t̪/	STEM-STEM-TH	regular

*except for /k/ in STEMs begins in a verbal root, in which case modifications from the ‘deleting’ phonology apply

Examples of reduplicated, polymorphemic verbal bases are shown in (3.83). Note that example (3.83b) shows modifications from the ‘regular’ phonology applying to /c+k/, while (3.83c) shows modifications from the ‘deleting’ phonology.

(3.83) a. *nal-daa~rnal-daa-th-*
ɳal-ʈaa-ɳal-ʈaa-t̪
head-bob$_{\text{NL}}$-head-bob$_{\text{NL}}$-
‘loll one’s head’

b. *kam-buri-~kam-buri-j-*
kaŋ-buɻi-c-kaŋ-buɻi-c-
speech-ROOT$_{\text{NL}}$-speech-ROOT$_{\text{NL}}$-
‘talking’

c. *karnaa--j~arnaa--j-*
kaɳa-i-c-kaɳa-i-c-
cook-fMID-TH-cook-fMID-TH-
‘being cooked’

d. *tharda-wi-~tharda-wi-j-*
t̪aʈa-wi-c-t̪aʈa-wi-c-
shoulder-fLWR-TH-shoulder-fLWR-TH-
‘swinging one’s shoulder’

e. *mibur-maru-ny~mibur-maru-th-*
mipuɻ-maɻu-t̪-mipuɻ-maɻu-t̪-
eye-fDAT-TH-eye-fDAT-TH-
‘look and look’

f. *karrma-thu~karrma-thu-th-*
karma-t̪u-karma-t̪u-t̪-
clasp-fRCP-clasp-fRCP-TH-
‘all clasp against one another’

3.12.5 Selection of bases by suffixes

Most suffixal morphs, when functioning derivationally, select either verbal bases or nominal, but not both. There are some exceptions to this though. In §3.6.3 above we saw fPRIV attaching to verbal and to nominal bases. Likewise, the formal factitive (fFACT) apparently attaches to both nominal (3.84a,b) and verbal (3.84c,d) bases.[31]

(3.84)

a. *kunya-ru-th-*
kuɲa-ɻu-t̪-
small-fFACT-TH-
'make OBJ small'

b. *warngii-lu-th-*
waɻŋiːc-ɻu-t̪-
one-fFACT-TH-
'mix OBJ'

c. *maka--lu-th*
maka-t̪-ɻu-t̪-
rest-TH-fFACT-TH-
'calm OBJ down'

d. *birji--lu-th*
piɻci-c-ɻu-t̪-
be still alive-TH-fFACT-TH-
'bring OBJ back from the edge of death'

Some suffixes specifically select bases containing multiple roots. The formal nominaliser (fN) for example often attaches to a nominal + verbal root complex (3.85), to a nominal + reduplicated verbal root (3.86), or to nominal + nominal + verbal root as in (3.87). On the semantics of such nominalisations see Evans (1995a:455–69).

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[31] Another conceivable analysis is that fFACT attaches solely to nominal bases, and that it attaches to nominalisations of verbs — the underlying strings /*x*-c-n-ɻu-t̪/ and /*x*-t̪-n-ɻu-t̪/ 'TH-fN-fFACT-TH' would surface as /*x*-lu-t̪-/. This has some semantic plausibility: fFACT attached to a verbal stem connotes indirect or temporally removed causation (Evans 1995a:284). This would be consistent with the literal meaning of putative V-TH-fN-fFACT, which would be 'make OBJ be one that is V-ing'.

(3.85) a. *bijarrba-rdaa--n-*
picarpa-ʈaː-c-n-
dugong-mount-TH-fN-
'dugong "wrestler"'

b. *maku-kurrii---n-*
maku-kuri-i-c-n-
woman-look-fMID-TH-fN-
'one who is watched by women'

c. *damuru-kuli-yii--n-*
ʈamuɻu-kuluː-i-c-n-
corm-dig-fMID-TH-fN-
'corm-digging instrument'

(3.86) a. *muni-la-yii-la-yii--n-*
munir-ɻaː-i-c-ɻaː-i-c-n-
breast-spear-fMID-TH-spear-fMID-TH-fN-
'plant sp., whose stem is snapped and pricked against a woman's breast to promote lactation; lit. breast-pricking instrument'

b. *kantharr-jaa--jaa--n-*
kan̪t̪ark-caː-c-caː-c-n-
alone-poke-TH-poke-TH-fN-
'one who pokes (in the sand for crabs) alone'

(3.87) a. *mutha-rdangka-kuri-lu--n-*[32]
mut̪a-ʈaŋka-kurir-ɻu-t̪-n-
many-person-dead-fFACT-TH-fN-
'killer of many people'

b. *wuran-kantha-rdiya--n-*
wuɻan-kan̪t̪ark-ʈia-c-n-
food-alone-eat-TH-fN
'one who eats food alone'

Pronominal stems can appear before verbal roots in plain (3.88a) and past (3.88b) nominalisations.

(3.88) a. *ni-wan-marndi--n-*
ŋi-paɲ-maɳʈi-c-n-
3sg-fPOSS-rob-TH-fCONS-
'the one who robbed him'

b. *ngij-in-badi-j-arrba-*
ŋicu-iɲ-pati-c-ŋarpa-
1sg-fINY-carry-TH-fCONS-
'my mother, lit. the one who bore me'

[32] There appears to be some optionality in the order of the nominal roots here: compare *maku-mutha-karrngi--n-* 'woman-many-take-TH-fN-', i.e., 'taker of many women'.

The formal privative, proprietive and associative suffixes (fPRIV, fPROP, fASSOC) can attach to nominal$_1$ + nominal$_2$ complexes to create stems meaning '(not) having nominal$_2$ at nominal$_1$' as shown in (3.89).

(3.89) a. *wara-wuran-kuru-*
waɻa-wuɻan-kuɻu-
mouth-food-fPROP-
'having food in its mouth'

b. *kurndu-kuna~wuna-wuru-*
kuɳʈuŋ-kuna~kuna-kuɻu-
chest-child$_{NL}$-child$_{NL}$-fPROP-
'having a child on her chest'

c. *natha-rdangka-warri-*
ɳat̪a-ʈaŋka-wari-
camp-man-fPRIV-
'unmarried (of woman), lit. having no man in her camp'

d. *natha-maku-rnurru-*
ɳat̪a-maku-ɳuru-
camp-woman-fASSOC-
'married (of man), lit. having a woman in his camp'

3.12.6 Formal overlap of derivational and inflectional suffixes

Many suffixal morphs function both as derivational and inflectional suffixes (for a comprehensive discussion of forms and inflectional function see Chs.6–7). Some otherwise exclusively inflectional suffixes are used derivationally in place names — this includes the formal locative, ablative and genitive (fLOC, fABL, fGEN) and the formal allative (fALL) allomorph /ɻiŋ/; examples are shown in (3.90).

(3.90) Literal analyses of place names

a.	*Makarrk-i-*	b.	*Birrmi-i-*[33]	c.	*Duju--naba*
	makark-ki-		pirmu-ki-		ʈucu-ki-napa-
	anthill-fLOC-		sternum-fLOC-		fish sp.-fLOC-fABL-
d.	*Ngaarrk-i-naba-*	e.	*Jiwiri-karra*	f.	*Mulaji-karra*
	ŋaːrk-ki-napa-		ciwiɻi-kara		mulaci-kara
	pandanus nut-fLOC-fABL-		bird sp.-fGEN.T		fish sp.-fGEN.T
g.	*Balarr-i-r-iic-*	h.	*Bujuku--r-iic-*		
	palar-ki-ɻiŋ-iːc-		pucuku-ki-ɻiŋ-iːc-		
	white-fLOC-fALL-fCONT-		bird sp.-fLOC-fALL-fCONT-		

The formal dual (fDU) suffix usually functions inflectionally but also appears in several stems as a derivational suffix:

(3.91)

a.	*darr-iyarrng-*	b.	*mun-kiyarrng-*	c.	*marl-dingkarr-iyarrng*
	ʈar-kiarŋ-		mun-kiarŋ-		maɻ-ʈiŋkar-kiarŋ-
	thigh-fDU-		bottom-fDU-		hand-long-fDU-
	'lap'		'whale'[34]		'scorpion'

3.12.7 Removable final morphs in complex stems

Two morphs are variably removable from the end of stems when those stems are derived or inflected. The strings /cu/ and /t̪u/ appear at the end of many kin terms, and are sometimes removed before other suffixes, as shown in (3.92).[35]

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[33] This name is realised as *Birrmuyi* by some speakers. The same point of variation is found in other names containing underlying /...u-ki/, e.g. *Thundii* ~ *Thunduyi*, and reflects a different choice of hiatus resolving phonology (cf §3.6.3).

[34] So named for its split tail, i.e., 'two rear ends'.

(3.92) a. *ngamathu-*
ŋamaṯu-
mother-
'mother

b. *marrkathu-*
markaṯu-
aunt-fPRIV-
'aunt'

c. *babiju*
papicu-
Fa.Mo-fPRIV-
'grandmother'

d. *ngamathu-warri-*
~ngama-warri-
ŋama(ṯu)-warri-
mother-fPRIV-
'motherless'

e. *marrkathu-barda-*
~marrka-barda-
marka(ṯu)-paʈa-
aunt-fDEAR-
'aunty dear'

f. *babij-arrath-*

papic-jaraṯ-
Fa.Mo-fANOTH-
'another grandmother'

The fBORN morph /ŋaṯi/ attaches to stems that refer to a place *P* to derive a stem, also a proper name, of a person born at *P*. In some names, a final fLOC morph in a place name can be removed (3.93c), and reduplicated place names shorted (3.93d) before fBORN.

(3.93) a. *Makarrk-i-*
makark-ki-
anthill-fLOC-
(Place name)

b. *Murdu-murdu-*
muʈu-muʈu-
tree sp.-tree sp.-
(Place name)

c. *Makarrk-i-ngathi-*
~ Makarr-ngathi
makark(-ki)-ŋaṯi-
anthill(-fLOC)-fBORN-
(Person's name)

d. *Murdu-murdu-ngathi-*
~ Murdu-ngathi
muʈu(-muʈu)-ŋaṯi-
tree sp.(-tree sp.)-fBORN-
(Person's name)

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[35] See Evans (1995a:192–93) for more on the synchronic allomorphy of kin terms; see Round & Evans (in prep.) for its historical origins.

3.12.8 Compound and ligative suffixes

Several pairs and tuples of suffixal morphs in Kayardild have specific, non-compositional functions when used together. This phenomenon has been noticed elsewhere in Australian languages, usually in connection with suffixes that realise case, and has been discussed under the rubrics of 'pre-case' (Blake 1987), 'case spacing' (Dench & Evans 1988), 'derivational case' (Austin 1995), 'ligative' affixation (Blake 1987; Schweiger 2000), and 'compound case' (Schweiger 2000). Here, I generalise the case-based terminology of Schweiger (2000) to cover all comparable suffixal behaviour, distinguishing between **compound suffixes** and **ligative suffixes**.[36]

A compound suffix will be defined here as a string comprised of two suffixal morphs *a*+*b*, which has a unitary, non-compositional function different to that of *a* or *b* used alone. Particularly common in Kayardild are pairs in which the second morph is the formal same (fSAME), of which some examples are shown in (3.94). Compound suffixes play an important role in the Kayardild inflectional system, on which see further Ch.6 §6.2.7.

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[36] Unlike Schweiger (2000) though, instances of compound and ligative suffixation are posited purely on synchronic grounds, not diachronic.

(3.94) a. *ngarn-ki-c-*
ŋaɳ-ki-ic-
beach-fLOC-fSAME-
beach-‹PERLATIVE›-
'moving along the beach'

b. *ra-yin-ki-ri-c-*
ɻa-in-ki-ɻiŋ-ic-
south-fFRM-fLOC-fALL-fSAME-
south-‹CENTRIPETAL BOUNDARY›-
'thing located to the south across a geographical boundary'

c. *kalkan-balath-ic-*
kalkan-palat̪-ic-
sick-‹fPL-fSAME›-
sick-‹EVERY›-
'all sick'

A ligative suffix *l* appears before another suffix morph in a formal combination *l+b*, which has a unitary function that can be identified just with *b* — that is, *l* is semantically empty. Ligative suffixes in Kayardild are discussed in §3.13.7, and §3.13.8 below.

3.13 Regarding specific suffixes

Suffixes addressed in this section are the formal middle (fMID) in §§3.13.1–3.13.2; formal reciprocal (fRCP) in §3.13.3; the morph fINY in §3.13.4; fLWR and fRATH in §3.13.5; the number-like suffixes fPLENTY, fSAME and fANOTH in §3.13.6; the formal allative and ablative (fALL, fABL) with respect to the formal locative (fLOC) in §3.13.7; the formal genitive (fGEN) and genitive ligature (fGENL) in §3.13.8; and the allomorphy of the formal proprietive (fPROP), formal ablative (fABL) and formal consequential (fCONS) in §3.13.9.

3.13.1 Formal middle, fMID

The formal middle (fMID) attaches to bases associated with a final thematic, and unlike most other suffixes, it appears *before* the thematic.

All allomorphs of fMID consist segmentally of /i/. Most are underlyingly stressed. Allomorphs of fMID can trigger hiatus resolving modifications of class II, III, IV or V (on which, see Ch.4, §4.4).

The standard allomorph of fMID is stressed (cf Ch.5 §5.3), and triggers class II hiatus resolving phonology (after /CV:/ roots) or class IV (elsewhere). It is this allomorph which attaches to verbal roots. Examples are shown in (3.95).

(3.95)

	Gloss	Active stem		Middle stem	
		Underlying	Surface	Underlying	Surface
a.	‘see’	kuri-c-	kuric-	kuri-i-c-	kuriːc-
b.	‘gather’	puɻu-t̪-	puɻut̪-	puɻu-i-t̪-	puɻiiːc-
c.	‘leave’	ʈana-t̪-	ʈanat̪-	ʈana-i-t̪-	ʈanaːc-
d.	‘eat’	ʈia-c-	ʈiac-	ʈia-i-c-	ʈiaːc-
e.	‘ascend’	waɲciː-c-	waɲciːc-	waɲciː-i-c-	waɲciːc-[37]
f.	‘scratch’	kuluː-c-	kuluːc-	kuluː-i-c-	kuliiːc-
g.	‘show’	maraː-c-	maraːc-	maraː-c-	maraiːc-
h.	‘shelter’	kiː-c-	kiːc-	kiː-i-c-	kiːc-
i.	‘pull’	puː-c-	puːc-	puː-i-c-	puiːc-
j.	‘bite’	paː-c-	paːc-	paː-i-c-	paiːc-

Other allomorphs of fMID attach to suffixes. A stressed allomorph which triggers class V hiatus resolving phonology attaches to the formal factitive (fFACT) and the formal reciprocal (fRCP) suffixes. Examples are shown in (3.96): the underlying string /u+i/, which yields /iiː/ in (3.95) above, yields /iː/ in (3.96).

(3.96)

	Gloss	Active stem	Middle stem	
		Underlying	Underlying	Surface
a.	fFACT	-ɻu-t̪-	-ɻu-i-t̪-	-ɻiː-c-
b.	fRCP	e.g. -n̪t̪u-t̪-	-n̪t̪u-i-t̪-	-n̪t̪iː-c-[38]

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[37] Middle forms of intransitive verbs such as *wanjiij-* ‘ascend’ are rarely used in Kayardild but they do occur. The middle form of an intransitive verb will appear in nominalisations referring to places where some intransitive action takes place. For example, the stem *budubudu-warra-a-n-* ‘boat-go-fMID-fN’ means ‘harbour’, literally, where boats go; *yalikida-wanjii--n* ‘crocodile-ascend-fMID-fN’ describes a place where crocodiles come ashore. Even reciprocals participate in the pattern: *barrngka-bala-nthi-i-n-* ‘water lily-hit-fRCP-fMID-fN’ describes a swamp where waterlilies hit against one another.

[38] On the existence of middles of reciprocals, see fn.37 above.

Examples of several other suffix + fMID combinations are shown in §3.13.2 next.

3.13.2 Thematic inflectional suffixes and their middle forms

In Kayardild, certain inflectional CASE categories, termed **thematic case** categories, are realised by suffixes that associate with thematics (for more on which see Ch.6, §6.2.6). Eight of these categories come in pairs whose formal relationship to one another can be expressed in terms of one suffix being basic and the other being comprised of the basic suffix plus fMID. These are listed in (3.97).

(3.97)

	Gloss	Morphomic	Underlying	Surface	(class)
a.	human allative	fHALL-TH	-càni-c-	-cànic-	
b.	purposive	fHALL-fMID-TH	-càni-ì-c-	-canìːc-	III
c.	OBJ-ablative	fOABL-TH	-wùla-t̪-	-wùlat̪-	
d.	SUBJ-ablative	fOABL-fMID-TH	-wùla-i-t̪-	-wùlaːc-	III
e.	dative	fDAT-TH	-màɻù-t̪-	-maɻùt̪-	
f.	translative	fDAT-fMID-TH	-màɻù-ì-t̪-	-maɻìːc-	V
g.	OBJ-evitative	fOEV-TH	-wàːlu-t̪-	-wàːlut̪-	
h.	SUBJ-evitative	fOEV-fMID-TH	-wàːlu-i-t̪-	-wàːlic-	IV

In (3.97b) the regular allomorph of fMID appears; in (3.97d) the allomorph triggers the usual, class IV hiatus resolution modifications but is underlyingly unstressed; in (3.97f) and (3.97h) the allomorphs trigger classes V and IV, and are stressed and unstressed respectively.

3.13.3 Formal reciprocal, fRCP

This section examines the formal reciprocal (fRCP) morph, focussing on its linear order and its allomorphy.[39]

The fRCP replaces the thematic of its base. In most cases, thematic /c/ is replaced by fRCP /ɲcu-t̪-/ and thematic /t̪/ fRCP /t̪u-t̪-/, as shown in (3.98).

(3.98) Surface forms of plain and regular reciprocal stems

	Gloss	Plain stem	Reciprocal stem
a.	'see'	kuri-c-	kuri-ɲcu-t̪-
b.	'refuse to share'	kuiɻiː-c-	kuiɻiː-ɲcu-t̪-
c.	'gather'	puɻu-t̪-	puɻu-t̪u-t̪-
d.	'scratch'	kuluː-c-	kuluː-ɲcu-t̪-
e.	'leave'	ʈana-t̪-	ʈana-t̪u-t̪-
f.	'share'	ŋukulmaː-c-	ŋukulmaː-ɲcu-t̪-
g.	'eat'	ʈia-c-	ʈia-ɲcu-t̪-

If the base to which fRCP attaches consists of a monosyllabic verbal root of the form /Caː/, then fRCP takes the form /n̪t̪u-t̪-/, and the long vowel of the root is shortened. I have no examples of reciprocals attaching to /Ciː/ stems. The verbal root *thuu-* /t̪uː-/ 'curse' has an irregular reciprocal *ju-nthu-th* which appears to be based on /cuː/, plus suffixation of /n̪t̪u-t̪-/ and vowel shortening, as shown in (3.99). In the case of compound stems which

[39] The formation of reciprocal stems is one area of the grammar where younger speakers' Kayardild differs noticeably from that of senior speakers, which is described here. Younger speakers often attach the allomorph /n̪t̪u-t̪-/ to polysyllabic roots other than *bala-th-* 'hit', and sometimes form reciprocals of monosyllabic roots as if they were polysyllabic, e.g. *baa-nju-th-* 'bite-fRCP-TH', or leave long vowels unshortened, e.g. *raa-nthu-th-* 'spear-fRCP-TH'.

end in a monosyllabic verbal root, there is variation:[40] sometimes one finds fRCP /n̪t̪u-t̪-/ with a shortened vowel, other times, /ɲcu-t̪-/ with the full vowel:

(3.99) Surface forms of plain and regular reciprocal stems

	Gloss	Plain stem		Reciprocal stem
a.	'bite'	pa:-c-		pa-n̪t̪u-t̪-
b.	'spear'	ɻa:-c-		ɻa-n̪t̪u-t̪-
c.	'copulate with'	ʈa:-c-		ʈa-n̪t̪u-t̪-
d.	'curse'	t̪u:-c-		cu-n̪t̪u-t̪-
e.	'kiss'	waʈa-pa:-c-	'lit. mouth-bite-TH'	waʈa-pa-n̪t̪u-t̪-
f.	'pull'	ʈar-pu:-c-	'lit. thigh-pull-TH'	ʈar-pu:-ɲcu-t̪-

The verbal root /wu:-/ 'give' has a reciprocal form in which the root is reduplicated, though the morphology and phonology involved require some interpretation. Recall first that laminal dental consonants in suffixes cannot follow long vowels. For this reason, the thematic TH after /CV:/ verbal roots is usually /c/. However, when /wu:-/ reduplicates in the reciprocal, it undergoes unexpected vowel shortening in both copies[41] and its thematic appears as dental /t̪/ (which now follows a short vowel). The thematic in the second copy

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[40] I have too few tokens of such words to determine what the basis of variation is. It could be lexical, phonological or inter-speaker variation.

[41] Taking a diachronic perspective, monosyllabic verbal roots are reconstructed in proto-Tangkic as having had short vowels. Thus, the short vowels in regular reciprocals like *ra-nthu-th-* are conservative, as are both of the short vowels in *wuthunthu-th-*. The long vowels in a verbal stem like *baa-j-* 'bite' were innovated between proto Tangkic and proto Southern Tangkic — compare Lardil (Northern Tangkic) *betha* 'bite'. In modern Kayardild though, it is the long vowel which is motivated as the underlying form, and thus the vowel length in an archaic form such as *wuthunthu-th-* is irregular.

is replaced by fRCP /n̪t̪u-t̪/. In addition the reduplicated ROOT-TH-ROOT- template undergoes modifications from the 'deleting phonology' so that /t̪+w/→/t̪/, yielding the form shown in (3.100).

(3.100) *wu-th-u-nthu-th-*
wut̪un̪t̪ut̪-
wu-t̪-wu-n̪t̪u-t̪-
give-TH-give-fRCP-TH-

Idiosyncratically, the root /pala-t̪/ 'hit' selects either of the fRCP allomorphs /n̪t̪u-t̪-/ or /t̪u-t̪-/, yielding both *bala-nthu-th-* and *bala-thu-th-* 'hit-fRCP-TH'. I have recorded individual speakers using both of these forms.

3.13.4 The fINY morph

Through historical accident, it happens in modern Kayardild that several pairs of morphs — whether suffixes or roots or both — relate to one another formally as if one were basic and the other comprised of the basic form plus a morph /iɲ/, which triggers class IV hiatus resolving phonology (so that /u-iɲ/ → /iɲ/; /i-iɲ/ → /iɲ/; and /a-iɲ/ → /aɲ/, cf Ch.4, §4.4).[42] Examples are shown in (3.101) (see also §3.9 above regarding pronominal stems). The morph will be labelled fINY. Evans (1995a:188–89) identifies several of the cases shown below, labelling the extra morph the 'individualiser' and remarks upon its semantic

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[42] Some of these forms probably do descend from **m*+/iɲ/, but most represent cases where /ɲ/ has been lost from an old, word final allomorph (cf the discussion in §3.7.1 above) and meanwhile retained in an old word internal allomorph. In the pronouns, some old strings */u+waɲ/ have become /iɲ/, i.e., synchronically /u+iɲ/.

heterogeneity. Here fINY is treated as a purely formal element; any semantic relationships between *m* and *m*-fINY are assumed to be stipulated entirely within individual lexical entries.

(3.101)

Morph *m*	Gloss	*m*+fINY	Gloss
paʈaŋu	'big'	paʈaŋiɲ	'thumb; big toe'
ʈirkuli	'husband'	ʈirkuliɲ	'male'
mut̪a	'much'	mut̪aɲ	'excessive'[43]
piʈi	'bad'	piʈiɲ	'mis-'
ŋicu	'1sg'	ŋiciɲ	'1sg.POSS'
-pa	fCONT	-paɲ	fPOSS
juʈa	'inside'	juʈaɲ-ci[44]	'pregnant'

3.13.5 Verbal derivational suffixes such as fLWR and fRATH

A number of verbal suffixal morphs recur in several stems, with a moderate to low degree of consistency in their semantic contribution. One example is what can be termed the formal 'lowering' morph (fLWR) /-wi-c-/. It attaches to a body part root to yield a verb meaning approximately 'lower one's BODY PART' — although such an analysis requires a fair degree of semantic latitude. Examples are shown in (3.102).

[43] Appears in *muthaluth-* /mut̪aɲ-ɻu-t̪-/ 'do excessively' and the formal excessive (fEXS) suffix /-mut̪aɲ/ .

[44] This could be segmented as /juʈa-iɲ-ci/ 'inside-fINY-fLOC'.

(3.102)	Root *m*	Gloss	*m*+fLWR	Gloss
	ɳal	‘head’	ɳalwic-	‘nod head’
	t̪aʈa	‘shoulder’	t̪aʈawic-	‘swing shoulder’
	ca	‘foot’	cawic-	‘run’
	pal	‘eyelash; feather’	palwic-	‘blink’
	cal	‘tongue$_{NL}$’	calwic-	‘poke tongue out’

Another suffix which can be identified on formal grounds but which exhibits little or no coherent semantics is /ɻa-t̪-/, will be designated as fRATH, and is illustrated in (3.103). For further suffixes of this nature in Kayardild, see Evans (1995a:286–88).

(3.103)	Root *m*	Gloss	*m*+fRATH	Gloss
	ɳit̪	‘name’	ɳilat̪-	‘call by name’
	ŋampu	‘well’	ŋampuɻat̪-	‘dig a well’
	ŋujar	‘bark, skin’	ŋujalat̪-	‘scale, skin, de-bark’
	t̪ara	‘bark, skin’	t̪araɻat̪-	‘scale, skin, de-bark’
	miːc	‘louse’	miːlat̪-	‘delouse’
	culta$_{NL}$	‘strong, tough’	cultaɻat̪-	‘punish’
	maʈalk	‘mud’	maʈalat̪-	‘paint (typically, with mud)’
	kan̪t̪ark	‘alone’	kan̪t̪alat̪-	‘grieve’

3.13.6 Non-inflectional, number-like suffixes

On the analysis advocated here, Kayardild possesses just two inflectional suffixes which convey number, the formal plural (fPL) and formal dual (fDU) — the criterial behaviour of an inflectional suffix is that it exhibits concord within the DP or NP, cf Ch.6.

Evans (1995a:183–87) also describes the formal plenty (fPLENTY) /wut̪iɲ/ as inflectional, however neither Evans’ data nor my corpus furnish any examples which can support (or refute) that claim. Two suffixes described as having ‘semantic affinities’ with number suffix are the EVERY use of fPL-fSAME (§3.12.8), and the formal another (fANOTH) suffix, neither of which are inflectional, as illustrated in (3.104) and (3.105).

(3.104)	*ngambunurruwalathida*	*dulk*	(not ... *dulwalathid*)
	ŋampu-ŋuru-‹palaṯ-ic›-ta	ʈulk-ka	
	well-fASSOC-‹EVERY›-T	place-T	
	‘places all with wells’ [E1984-5-7]		

(3.105)	*kiyarryarrada*	*wurkar*	(not ... *wurkarayarrada*)
	kiarŋ-jaraṯ-ta	wuɻkaɻa-ø	
	well-fANOTH-T	boy-T	
	‘two more boys’ [R2005-jun29]		

3.13.7 Formal allative fALL, formal ablative fABL, and the preceding fLOC

The formal ablative (fABL), whose allomorphs are /naa/ and /napa/ (cf §3.13.9.2 below), is always preceded underlyingly by a formal locative (fLOC) morph, /ki/ — this is true whether fABL realises an inflectional category (Ch.6) or functions derivationally (§3.12.6). Normally, this would invite a synchronic analysis in which the strings /ki-naa/ and /ki-napa/ are monomorphemic (as in the analysis of Evans 1995a). There is evidence however, for a dimorphemic analysis of these strings, as fLOC-fABL. That evidence relates to the formal allative (fALL) as follows.

Like all fABL allomorphs, the fALL allomorph /ɻiŋ/ is always preceded underlyingly by a fLOC morph, /ki/. However, the fALL allomorph /ɻuŋ/ is not. The /ɻuŋ/ form appears in the allative interrogative shown in (3.106a) and in the ‘allative stems’ of cardinal locational terms shown in (3.106b,c). In (3.106a,b) the word forms are compatible with analyses in which /ki/ is either present or not, but in (3.106c) it is clear that /ɻuŋ/ is not preceded by /ki/ — if it were, /pat̪-ki-ɻuŋ-/ would surface as /pat̪iɻuŋ-/. Since /ɻuŋ/ can appear without preceding /ki/, the string /ki-ɻuŋ/ is evidently dimorphemic.

(3.106)	a.	*jina-rung-*	b.	*ra-rung-*	c.	*ba-lung-*	
		cinaɻuŋ-		ɹaɻuŋ-		paluŋ-	; *pat̪iɻuŋ
		cina-(ki)-ɻuŋ-		ɹa-(ki)-ɻuŋ-		pat̪-ɻuŋ-	
		where-(fLOC)-fALL-		south-(fLOC)-fALL-		west-fALL-	
		'where to?'		'to/in the south'		'to/in the west'	

The next question is whether /ɻiŋ/ and /ɻuŋ/ are in fact variants of the one morph. If so, this would suggest that /ki-ɻiŋ/ is also dimorphemic. In the spoken register, evidence is lacking, but in song the situation is clear: /ɻiŋ/ and /ɻuŋ/ are conditioned variants. When fALL realises an inflectional feature in song it appears phonologically as /ɻuŋ/ when preceded on the surface by /a/, and as /ɻiŋ/ when preceded by /i/, as shown in (3.107).[45]

(3.107)	Spoken:	a.	*mala-ri*	b.	*dulk-i-ri*
	Song:		*mala-ru*		*dulk-i-ri*
			mala-ki-ɻVŋ-		ʈulk-ki-ɻVŋ-
			sea-fLOC-fALL-		country-fLOC-fALL-
			'sea-Ø-DIR'		'country-Ø-DIR'

Putting this together: the string /ɻuŋ/ can appear without preceding /ki/, so when /ki-ɻuŋ/ does appear, it is analysed as dimorphemic; in song /ki-ɻuŋ/ and /ki-ɻiŋ/ are conditioned variants, and so /ki-ɻiŋ/ is taken also to be dimorphemic. The initial /ki/ is these strings can be identified as fLOC (which is always /ki/); the /ɻuŋ/~/ɻiŋ/ morph is fALL. Finally,

[45] I do not currently have any clear examples of fALL after /u/.

based on the pattern of /ki-ɻiŋ/ fLOC-fALL, we can analyse /ki-naa/~/ki-napa/ as fLOC-fABL.

3.13.8 Formal genitive fGEN, and fGENL /pa-/

The formal genitive (fGEN) is realised as /kàraɲ/ (underlyingly stressed on its first syllable), and as /kàra/ in a cumulative fGEN.T morph. After the roots *dan-* /ʈan/ 'here; this', *dathin-* /ʈat̪in/ 'there; that', and *kiyarrng-* /kiarŋ/ 'two',[46] the usual fGEN is preceded by /pa/ as shown in (3.108).

(3.108)	a.	*dan-ba-karrany-* ʈan-pa-karaɲ- this-fGENL-fGEN- 'this-Ø-GEN'	b.	*dathin-ba-karrany-* ʈat̪in-pa-karaɲ- that-fGENL-fGEN- 'that-Ø-GEN'		
	c.	*dan-ba-karra* ʈan-pa-kara this-fGENL-fGEN.T 'this-Ø-GEN'	d.	*dathin-ba-karra* ʈat̪in-pa-kara that-fGENL-fGEN.T 'that-Ø-GEN'	e.	*kiyarr-ba-karra* kiarŋ-pa-kara two-fGENL-fGEN.T 'two-Ø-GEN'

The strings /pakàraɲ/ and /pakàra/ are stressed on the second syllable. They could each be analysed as a single morph, i.e., as allomorphs of fGEN and fGEN.T, or as dimorphemic strings /pa-kàraɲ/ and /pa-kàra/. There is little evidence which favours either analysis over the other, however it is true that all other suffixes that select nominal bases and which do not end in a thematic, are initial-stressed if they are underlyingly stressed at all. If the

[46] I have no tokens of a genitive inflection of *warngiij-* /waɻŋiːc/ 'one'.

genitive inflection is to follow this pattern, then /pa-/ should be analysed as a separate morph. Here, /pa-/ will be labelled as the 'genitive ligative' (fGENL).

3.13.9 Allomorphy of the formal proprietive, ablative and consequential

The formal proprietive, ablative and consequential (fPROP, fABL, fCONS) each have two allomorphs, shown in (3.109).

(3.109) Strong and weak allomorphs of fPROP, fABL and fCONS

	fPROP	fABL	fCONS
weak	kuu	naa	ŋara
strong	kuɻu	napa	ŋarpa

The allomorphs with the greater segmental content, labelled 'strong' are the only allomorphs that are used when fPROP, fABL or fCONS function as derivational morphs, and they are the only allomorphs used in Kayardild song. The following three subsections document the conditions under which the strong and the weak allomorphs are used in the spoken register.

3.13.9.1 The formal proprietive, fPROP

The formal proprietive morph (fPROP) is used (i) derivationally, and (ii) inflectionally as a realisation of CASE:proprietive, A-TAM:future and TH-TAM:potential (on inflectional categories, see Ch.6). In the spoken register, there are several determinants of which allomorph of fPROP is used, including an element of apparent free choice, which will not be formalised here. Table (3.110) summarises the distribution of strong and weak realisations of fPROP.

(3.110) Realisation of fPROP. *x*~*y* indicates free variation where *x* is much more common. On conditions M, P and L, see main text below.

		Function			
		Deriv.	CASE: proprietive	A-TAM: future	TH-TAM: potential
Realisation:	condition M	—	strong	—	—
	condition P	—	strong	strong	—
	condition L	—	—	strong	strong
	elsewhere	strong	str.~weak	weak~str.	weak~str.

Conditional M is morphological. It is met whenever an fPROP morph (i) realises a CASE feature, and (ii) is not the final suffix in the word (other than the termination, T). When it is met, the strong allomorph of fPROP must appear. Examples of fPROP realising CASE:proprietive are shown in (3.111).

(3.111) a. *wuran-kuruw-a ~ wuran-kuu-*
wuɻan-kuɻu-a ~ wuɻan-kuu-ø
food-fPROP-T
'food-PROP-Ø'

b. *wuran-kuru-ntha-* (**-kuu-*)
wuɻan-kuɻu-in̪t̪a-ø
food-fPROP-fOBL-T
'food-PROP-COMP-Ø'

c. *karwa-wuru$_1$-uruw$_2$-a* (**-wuu$_1$-*)
kaɻwa-kuɻu-kuɻu-a
club-fPROP-fPROP-T
'club-Ø-PROP-POT-Ø'

d. *dun-kuru-y-a* (**-kuu-*)
ʈun-kuɻu-ki-a
husband-fPROP-fLOC-T
'husband-PROP-INS-Ø'

e. *mawurraji-wuru-wurrka-* (**-wuu-*)
mauraci-kuɻu-kurka-ø
spear-fPROP-fLOC.fOBL-T
'spear-PROP-PRES.COMP-Ø'

f. *wumburung-kuru--na-* (**-kuu-*)
wumpuɻuŋ-kuɻu-ki-naa-ø
spear-fPROP-fLOC-fABL-T
'spear-Ø-PROP-Ø-PRIOR-Ø'

Condition P is phonological: it is met in any environment where the realisation of fPROP as the weak allomorph /kuu/ would, all else equal, result in an ill-formed surface phonological structure.[47] Relevant here is the fact that Kayardild does not permit sequences of three adjacent short vowels of which the first two are identical (on this restriction, see also §3.7.4 above). Accordingly */ŋukuuu/ and */makuuu/ in (3.112) are ill-formed because they contain the sequence */uuu/.

(3.112) a. *nguku-uruw-a *~ nguku-uu-*
ŋuku-kuɻu-a *~ ŋuku-kuu-ø
water-fPROP-T
'water-PROP-Ø'

b. *maku-uruw-a *~ maku-uu-*
maku-kuɻu-a *~ maku-kuu-ø
woman-fPROP-T
'woman-FUT-Ø'

The status of condition L is not immediately obvious. It is met whenever fPROP is followed by the formal locative (fLOC). Its effects are only distinct from those of other conditions when fPROP is used inflectionally and realises A-TAM:future or TH-TAM:potential, and in all such cases the following fLOC morph will be a realisation of COMP:empathy. When condition L is met, only the strong allomorph /kuɻu/ may appear, not weak /kuu/. What is unclear at this point is whether the conditioning is in terms of morphological features (that fPROP must be strong before a realisation of COMP:empathy), morphomic (that fPROP must be strong before fLOC) or phonological (that a surface string of two identical short vowels plus a semivowel is avoided). The topic is discussed further in

[47] Condition P fails to apply to fPROP which realises TH-TAM:potential, but only because such tokens of fPROP are alway preceded by a consonant.

§3.13.9.4 below. Note in (3.113) that when it precedes a fOBL morph that realises COMP:plain, fPROP is free to appear as weak /kuu/.

(3.113) a. *wuran-kuru-y-a* *~ *wuran-kuu-y-a*
wuɻan-kuɻu-ki-a *~ wuɻan-kuu-ki-a
food-fPROP-fLOC-T
'food-FUT-EMP-Ø'

b. *wuran-kuu-ntha-*
wuɻan-kuɻu-in̪t̪a-ø
food-fPROP-fOBL-T
'food-FUT-COMP-Ø'

c. *kala-th-uru-y-a* *~ *kala-th-uu-y-a*
kala-t̪-kuɻu-ki-a *~ kala-t̪-kuu-ki-a
cut-TH-fPROP-fLOC-T
'cut-Ø-POT-EMP-Ø'

d. *kala-th-uu-ntha-*
kala-t̪-kuɻu-in̪t̪a-ø
cut-TH-fPROP-fOBL-T
'cut-Ø-POT-COMP-Ø'

3.13.9.2 The formal ablative, fABL

The formal ablative (fABL) is used (i) derivationally, and (ii) inflectionally as a realisation of CASE:ablative, A-TAM:prior and A-TAM:precondition. Table (3.114) summarises the distribution of strong and weak realisations of fABL in the spoken register.

(3.114) Realisation of fABL. On conditions M and L, see main text below.

		Function			
		Derivational	CASE: ablative	A-TAM: prior	A-TAM: precondition
Realisation:	condition M	—	strong	—	—
	condition L	—	—	strong	—
	elsewhere	strong	weak	weak	strong

Conditional M is morphological, and is parallel to condition M which applies to fPROP. It applies only to an fABL morph which realises a CASE feature, and is met whenever that fABL morph is followed in the word by anything other than T. Examples of fABL realising CASE:ablative are shown in (3.115).

(3.115) a. *kangku-naa-* (**-naba-*)
kaŋku-ki-naa-ø
grandfather-fLOC-fABL-T
'grandfather-Ø-ABL-Ø'

b. *dan-ki-naba-nguniy-a* (**-naa-*)
ţan-ki-napa-ŋuni-a
this- fLOC-fABL-fINST-T
'this-Ø-ABL-INST-Ø'

c. *ngamathu-naba-na-* (**-naa-*)
ŋamat̪u-ki-napa-naa-ø
mother-fLOC-fABL-fABL-T
'mother-Ø-ABL-PRIOR-Ø'

d. *kakuju-naba-wu-* (**-naa-*)
kakucu-ki-napa-kuu-ø
uncle-fLOC-fABL-fPROP-T
'uncle-Ø-ABL-POT-Ø'

e. *balarr-i-naba-wu-* (**-naa-*)
palar-ki-napa-kuu-ø
white-fLOC-fABL-fPROP-T
'white-Ø-ABL-PROP-Ø'

Condition L on fABL is parallel to condition L which applied to fPROP. Its effects are only distinct for fABL which realises an A-TAM:prior, and is met when that fABL morph is followed by fLOC, which in all cases will realise COMP:empathy. When condition L is met, only the strong allomorph /napa/ may appear, not weak /naa/. Note in (3.116) that when it precedes a fOBL morph that realises COMP:plain, fABL is free to appear as weak /naa/.

(3.116) a. *dan-ki-naba-y-a* *~ *dan-ki-naa-y-a*
ţan-ki-napa-ki-a *~ ţan-ki-naa-ki-a
here-fLOC-fABL-fLOC-T
'here-Ø-PRIOR-EMP-Ø'

b. *dan-ki-naa-ntha-*
ţan-ki-naa-in̪t̪a-ø
here-fLOC-fABL-fOBL-T
'here-Ø-PRIOR-COMP-Ø'

3.13.9.3 The formal consequential, fCONS

The formal consequential (fCONS) is used (i) derivationally, and (ii) inflectionally as a realisation of CASE:consequential, TH-TAM:past and TH-TAM:precondition. Table (3.117) summarises the distribution of strong and weak realisations of fCONS.

(3.117) Realisation of fCONS.

	Function			
	Derivational	CASE:consequential	TH-TAM:past	TH-TAM:precond.
Realisation:	strong	strong	weak	strong

Unlike fPROP and fABL, the weak form of fCONS is never used when it realises a CASE feature. As a result, there is no visible 'condition M' which applies to it. It would still be possible however, to state condition M generally in reference to all three of fPROP, fABL and fCONS: only strong allomorphs of morphomes are used if the morphome realises a CASE feature and is followed in the word by anything other than T. There is also no 'condition L' which applies to fCONS, a fact which is discussed further in §3.13.9.4 next. In (3.118a) the weak fCONS allomorph /ŋara/ appears even before fLOC which realises COMP:empathy (i.e., before the same element which requires strong forms of a preceding fPROP or fABL).

(3.118) a. *warra-j-arra-y-a*
wara-c-ŋara-ki-a
go-TH-fCONS-fLOC-T
'go-Ø-PAST-EMP-Ø'

b. *warra-j-arra-ntha-*
wara-c-ŋara-in̪t̪a-a
go-TH-fCONS-fOBL-T
'go-Ø-PAST-COMP-Ø'

3.13.9.4 The nature of conditions M, P and L

We have seen in §§3.13.9.1–3.13.9.3 that three conditions trigger the use of strong allomorphs of fPROP, fABL and fCONS in cases where weak allomorphs would otherwise appear. As just mentioned, condition M can be regarded as applying generally to fPROP, fABL and fCONS (i.e., to all suffixes with strong and weak allomorphs) if it is formulated as in (3.119). Since the strong allomorph of fCONS is always used when it realising CASE, the application of condition M to fCONS is redundant.

(3.119) Condition M (general statement)
The strong allomorph of a morphome is used if that morphome realises a CASE feature and is followed in the word by anything other than the termination, T.

Condition P can also be stated generally, as in (3.120). It only applies visibly to fPROP, since neither fABL nor fCONS have allomorphs which would enter into structure containing the illicit $*V_\alpha V_\alpha V$ sequence.

(3.120) Condition P (general statement)
An allomorph is not used if it would give rise to a sequence of two identical short vowels followed by another vowel.

In §3.13.9.1 when condition L was introduced, it was mentioned that it is unclear upon an initial inspection what the basis of the conditioning is — it could be morphosyntactic (i.e., related to inflectional features), morphomic, or phonological. To recap, strong forms must be used for both fPROP and fABL when they (i) realise A-TAM or TH-TAM features, and (ii) precede fLOC which realises COMP:empathy. Now, in all other cases where fPROP and fABL precede fLOC, other considerations already require that the strong form be used, so condition L could be formulated generally, as a morphomic condition: 'fPROP and fABL are strong before fLOC', or as a phonological condition: 'fPROP and fABL allomorphs /kuu/ and /naa/ are not used before /j/ (which is what fLOC surfaces as)'. It could also be formulated as a morphosyntactic condition: ‘fPROP and fABL are strong before the realisation of COMP:empathy’.[48]

What appears to be revelant here is that although the weak forms of fPROP and fABL cannot appear before fLOC, the weak form of fCONS can (§3.13.9.3). As a consequence, both the morphomic and the morphosyntactic formulations of condition L would fail to be applicable across the board to fPROP, fABL and fCONS. On the other hand, a phonological formulation would be completely general if stated as in (3.121).

(3.121) Condition L (general statement)
An allomorph is not used if it would give rise to a sequence of two identical short vowels followed by a semivowel.

Although condition L in (3.121) is similar in its formulation to condition P, the two are not entirely parallel in terms of their relationship to other aspects of Kayardild phonology. Specifically, condition P is independently motivated by Kayardild phonotactics: $*V_\alpha V_\alpha V$

[48] If condition L were construed as morphosyntactic in nature, it would violate the Peripherality Principle proposed by Carstairs (1987). Framed within the terminology used here, the peripherality principle states that if the allomorphy of affix *a* is sensitive to the morphosyntactic properties realised by suffix *b*, and if *a* is closer to the root than *b*, then *a* may be sensitive to the *feature* which *b* realises, but not to individual feature values. Condition M accords with this principles: the allomorphy of case suffixes (*a*) are affected by whether or not other inflectional suffixes (*b*) follow, but are not sensitive to the individual feature values they realise. On the other hand, if condition L were cast as a morphosyntactic condition, it would violate the peripherality principle because A-TAM and TH-TAM suffixes (*a*) would be sensitive to the specific value (empathy) of a feature (COMP) realised by suffixes (*b*) which are further from the root than *a* is.

strings are systematically absent from all Kayardild surface forms, as are *V:V strings. In contrast, V:+semivowel strings are permitted in Kayardild, as illustrated in (3.122). Notwithstanding this though, a phonological formulation of condition L is the most general, and accounts for why fPROP and fABL are impacted differently than fCONS. A formal account will be presented in Ch.4, §4.5.

(3.122)	a.	*yiiwi-ja*	b.	*waa-yaa-ja*	c.	*kuu-warriy-a*
		ji:wica		wa:ja:ca		ku:waria
		ji:wi-ca		wa:-c-wa:-ca		ku:k-wari-a
		sleep-TH.T		‹sing-TH-sing›-TH.T		wound-fPRIV-T
		'sleep-ACT'		'‹sing a lullaby›-ACT'		'unwounded-Ø'

3.14 The basis of phonologically conditioned allomorphy

In §3.7.4 and §3.13.9 two different kinds of phonologically conditioned allomorphy were introduced. In §3.7.4, the choice between allomorphs /ta/ and /ka/ of T was presented as hingeing on the *underlying* form of the base to which the allomorphs attach. In §3.7.4 and §3.13.9, the choice between allomorphs /a/ and Ø of T, and between the allomorphs of fPROP, fABL and fCONS which realise A-TAM and TH-TAM features, was presented as hingeing on the *surface* forms that result when one or other allomorph is chosen as an input. For convenience, let us refer to allomorphy as **non-surface directed** if it is decided on the basis of underlying forms, and **surface directed** if it is decided on the basis of its implications for surface form. The goal of this section is to cross-check these analyses, to confirm that the choice between /ta/ and /ka/ for T is indeed best analysed as non-surface directed (§3.14.1), and that the other cases are best analysed as surface directed (§3.14.2).

The results are compared to two strong typological claims made recently regarding phonologically conditioned allomorphy in §3.14.3.

3.14.1 Allomorphy of T involving /ta/ and /ka/ is not surface directed

The notion of 'surface directed' allomorph selection is one which will be defined formally in Ch.4, §4.5, but for the moment it will suffice to continue using an informal definition and focus on just one fact: that surface directed allomorphy should result in an allomorph being chosen, which, once the phonology applies, produces the 'least marked' surface form. We will need to bear in mind that allomorph /ta/ triggers modifications from the regular phonology and that /ka/ triggers modifications from the deleting phonology. Table (3.123) shows all of the clusters which can appear at the end of a base to which T attaches, and the strings which would result from adding /ta/ and /ka/ to them and applying modifications from regular and deleting phonologies respectively. A 'markedness' column provides an appraisal of the relative markedness of the two resulting forms, going by (i) the complexity of the resulting cluster and (ii) whether or not the cluster is homorganic. This is based on the reasonable assumption that more complex clusters are more marked than simpler clusters and intervocalic consonants, and that heteorganic nasal+obstruent clusters are more marked than homorganic nasal+obstruent clusters — evidence for both assumptions can be found in the facts of Kayardild phonotactics (Ch.2 §2.3). The results of the comparison are displayed as 'ta > ka' if the form generated by using /ta/ is more marked; 'ka > ta' if the reverse holds; or as 'ta ≈ ka' if the two are equal. The underlined allomorph is the one actually used.

(3.123)

Base final	+ta	+ka	Markedness	Base final	+ta	+ka	Markedness
ɻ	ɻta	ɻa	<u>ta</u> > ka	ŋ	ta	ŋka	<u>ka</u> > ta
l	lta	la	<u>ta</u> > ka	k	ta	ka	<u>ka</u> ≈ ta
r	ra	ra	<u>ta</u> ≈ ka	lŋ	lta	lŋka	<u>ka</u> > ta
ɳ	ɳta	ɳka	<u>ta</u> ≈ ka	rŋ	ra	rŋka	<u>ka</u> > ta
n	nta	nka	ka > <u>ta</u>	ɻk	ɻta	ɻka	<u>ka</u> ≈ ta
ɲ	nta	ɲca	<u>ta</u> ≈ ka	lk	lta	lka	<u>ka</u> ≈ ta
t̪	ta	t̪a	<u>ta</u> ≈ ka	rk	ra	rka	<u>ka</u> > ta
c	ta	ca	<u>ta</u> ≈ ka				

As can be seen in (3.123) there is just one instance — after base final /n/ — in which the choice of allomorph leads to the surface form being less marked than it otherwise would be (and as it should be if allomorph selection were indeed surface directed). By contrast, there are six instances in which choice of allomorph leads to the surface form being *more* marked than it otherwise would be. Moreover, if we were to expand our scope and consider also the forms generated by the selection of the /a/ allomorph of T — which would *always* be the least, or equally-least marked — we would only reconfirm the clear result, that the selection of allomorphs /ta/ and /ka/ of T cannot be reanalysed as surface directed, rather it is non-surface directed as proposed above in §3.7.4.

3.14.2 Allomorphy for which a non-surface directed analysis is unconvincing

As we have seen just above, it is possible in at least some circumstances to refute a claim that a certain kind of phonologically sensitive allomorphy is surface directed. This is not so for a claim that it is non-surface directed, for there will always be some analysis available — albeit perhaps an uninformative one — under which phonologically sensitive allomorphy is treated as being sensitive to underlying forms. As such, what we require is an evaluation of how perspicuous or insightful the surface directed analysis is, compared to a competing non-surface directed analysis. The point here will be to show that there are cases in Kayardild in which there is good reason to maintain a surface directed analysis and not to opt for a non-surface directed alternative.

In §3.7.4 and §3.13.9, five allomorph choices were accounted for in terms of two marked structures which can be avoided in surface forms by selecting an appropriate allomorph. The avoided structures are strings of two identical short vowels ($V_\alpha V_\alpha$) followed by either a third short vowel (V) or a semivowel (S), and the allomorph choices motivated by them are listed in (3.124).

(3.124)

	Allomorph choice		Motivation surface	underlying
a.	T	≠ /a/ after /uu, aa/	avoid $*V_\alpha V_\alpha V$	$*V_\alpha V_\alpha$+a
b.	fPROP	≠ weak /kuu/ after /u/	avoid $*V_\alpha V_\alpha V$	*u+kuu
c.	fPROP	≠ weak /kuu/ before fLOC /ki/	avoid $V_\alpha V_\alpha S$	*kuu+ki
d.	fABL	≠ weak /naa/ before fLOC /ki/	avoid $V_\alpha V_\alpha S$	*naa+ki
e.	fCONS	= weak /ŋara/ before fLOC /ki/	(avoid $V_\alpha V_\alpha S$)	ŋara+ki OK

The surface directed explanation accounted for (i) all of this phonologically conditioned allomorphy in terms of two, related phonological strings ($V_\alpha V_\alpha V$ and $V_\alpha V_\alpha S$); (ii) why fPROP alone has a weak/strong alternation sensitive to context on the left; and (iii) why fCONS alone has a weak/strong alternation which is *in*sensitive to context on the right. Let us now review what a non-surface directed account would look like.

On a non-surface directed account, the /a/ and Ø allomorphs of T will be sensitive to underlying form just like the /ta/ and /ka/ allomorphs in §3.14.1 above. Within that account, the fact listed as (3.125a), that /a/ cannot follow underlying $V_\alpha V_\alpha$, does not follow from any other generalisation in Kayardild phonology or morphology. For example, allomorph selection does not in general avoid creating *underlying* $V_\alpha V_\alpha V$ strings in Kayardild, as can been seen in the fact that the fPROP allomorph /kuu/ and the fABL allomorph /naa/ are free to appear before fOBL /iṉ̪ṯa/.

Likewise, the fact (3.126b) that the 'weak' fPROP allomorph /kuu/ cannot appear after /u/ must simply be stipulated. It follows neither from any identifiable phonological restriction, nor from any morphological consideration. Weak fABL and weak fCONS can both follow /u/, and weak fABL /naa/ with double /aa/ can follow /a/. Other morphs beginning in /ku/, including fLOC.fOBL /kurka/ and 'strong' fPROP /kuɻu/ can follow /u/.

The facts (3.127c,d) that both weak fPROP and weak fABL are cannot precede fLOC /ki/ can be considered a minor generalisation, but why fCONS does not also pattern this way (3.128e) has no motivation within a non-surface directed account.

In sum, five allomorph choices which are accounted for in terms of two, related, phonological constraints under a surface directed account, find little if any coherent motivation under a non-surface directed account.

3.14.3 Phonologically conditioned allomorphy and typology

Two claims have been made recently (Paster 2006; to appear) regarding universals of phonologically conditioned allomorphy, which the Kayardild data appear to refute. The first is that phonologically conditioned allomorphy of a morph *m* is never sensitive to material which in linear terms is further removed from the root than *m* is. This appears to be contradicted by the sensitivity of fPROP and fABL allomorphs to suffixes on their right. As argued in §3.13.9.4, a reanalysis of the data in terms of a morphological sensitivity —

to the morphome fLOC or to the morphosyntactic feature COMP:empathy — is possible, but it fails to explain why fCONS patterns differently to fPROP and fABL, whereas the phonological analysis does offer an account. The second claim is that there is no phonologically conditioned allomorphy which, to use the terminology employed above, is 'surface directed'. Again, the Kayardild data appear to contradict the claim. Arguments offered in §3.14.2 provide good support for a surface directed analysis of the /a/~Ø allomorphy of T and of the phonologically conditioned allomorphy of fPROP, fABL and fCONS.

The facts of Kayardild can be added to the short list of *prima facie* counter examples to these two typological claims, which can be found in Carstairs (1987:179–88; 1988), and to the carefully argued case from Surmiran (Rumantsch), provided by Anderson (2008).

3.15 Song forms and their place in Kayardild grammar

Kayardild has not been documented as possessing any special speech registers in which the phonology, morphology or syntax departs from normal everyday speech. However, the morphology of Kayardild song is distinctive.[49,50] From a diachronic angle, it is archaic.

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[49] See also Evans (1995a:597) for a Kayardild chant, which may be unique in its genre.

[50] Regrettably, considerations of space preclude a fuller discussion of the fascinating phonetics, phonology and syntax Kayardild song. Some brief observations can be offered here. Regarding phonetics, song is articulated with (i) very little jaw movement; (ii) significant lenition of closure in the oral tract; (iii) significant coarticulation of vowels across adjacent syllables; and (iv) no use of pitch-based melody, but (v) deliberate

There are two points on which the morphology of Kayardild song departs from the morphology of the spoken register. The first departure relates to the formal allative, fALL, and was discussed above in §3.13.7 above. The second departure pertains to the allomorphy of fPROP, fABL and fCONS, introduced in §3.13.9 above. As mentioned briefly then, song permits only the use of strong allomorphs, never weak. This is illustrated in the case of fPROP which realises the feature value A-TAM:future, in (3.129) and (3.130).

(3.129) Spoken register

a.	*mala-wu-*	b.	*tharda-wuu-ntha-*	c.	*mala-wuru-y-a*
	mala-kuu-ø		t̪aɻa-kuu-in̪t̪a-ø		mala-kuɻu-ki-a
	sea-fPROP-T		shoulder-fPROP-fOBL-T		sea-fPROP-fLOC-T
	sea-FUT-Ø		shoulder-FUT-COMP-Ø		sea-FUT-EMP-Ø

(3.130) Song register [R2007-jun04b, R2007-jul07a]

a.	*mala-wuruw-a*	b.	*tharda-wuru-ntha-*
	mala-kuɻu-a		t̪aɻa-kuɻu-in̪t̪a-ø
	sea-fPROP-T		shoulder-fPROP-fOBL-T
	sea-FUT-Ø		shoulder-FUT-COMP-Ø

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manipulation of voice modality, apparently through the use of a significantly raised pharynx and tightened vocal folds;. Regarding phonology, vowel length is flexible in song, so that short vowels can be lengthened and long vowels shortened; whether there is a complete collapse of the phonological length distinction is a question for future research. Regarding syntax, at this point I can say little, except to note (i) the presence in each sung sentence of at least one copy of a monosyllable *nga* /ŋa/ — *nga* does not appear serve to any phonological purpose, for example to complete uneven feet, and it does not appear inside words; and (ii) the fact that one ‘verse’ (these are ~10 seconds long, but vary considerably) will often begin with a fragment of the final word of the preceding verse; I have not been able do identify any clear pattern to this — the fragment does not contain a consistent number of syllables, feet or morphs. Finally, all verses end with β-final truncation.

Although song permits only strong allomorphs, this is not to say that song forms always merely neutralise a strong/weak distinction found in the spoken register. A case in point is fCONS, which has a weak allomorph /ŋara/ and strong /ŋarpa/, as follows.

In the spoken register the weak (and never the strong) allomorph of fCONS realises TH-TAM:past, as shown in (3.131a), while the strong (and never the weak) allomorph realises TH-TAM:precondition and CASE:consequential, as in (3.131b,c). In song, although I have identified only a handful of instances of TH-TAM:past, they are all realised by the strong (and not the weak) allomorph of fCONS as illustrated in (3.132).

(3.131) Spoken register

	a.	b.	c.
	kurri-j-arra-	*kurri-j-arrba-*	*yarbu-nyarrba-*
	kuri-c-ŋara-ø	kuri-c-ŋarpa-ø	jaɻpuṯ-ŋarpa-ø
	see-TH-fCONS-T	see-TH-fCONS-T	animal-fCONS-T
	see-Ø-PST-Ø	see-Ø-PRECON-Ø	animal-CONS-T

(3.132) Song register [R2007-jul07a]

a. *kurri-j-arrba-*
kuri-c-ŋarpa-ø
see-TH-fCONS-T
see-Ø-PST-Ø

Significantly, it is only in the comparison of the two registers that we find the evidence that /ŋarpa/ and /ŋara/ are related as strong–weak allomorphs, since in neither register taken on its own is there is a morphosyntactic feature value which is realised by both /ŋarpa/ and /ŋara/.

Since it appears that all adults in traditional Kayardild society both composed and sang songs and thus had mastery over both the spoken and sung registers, and since the morphological system in both registers is so similar, it is reasonable to assume that speakers possessed a single grammar which underlay all forms. Accordingly, when analysing Kayardild morphology, evidence is considered from both registers. A formal account which derives the correct register-specific forms is given in Ch.7 §7.2.4.2.

3.16 A lexicon of Kayardild suffixes

The following table provides a list of all suffixal morphomes which are mentioned in the dissertation, together with their underlying phonological realisations and an indication of their functions, some aspects of which will be discussed in later chapters. Phonological realisations each consist of a string of underlying phonological segments, a representation of underlying stress (cf Ch.5, §5.3.5), and one or more stratal diacritics (Ch.4, §4.3), shown as a subscript to the left of the phonological string. Some morphomes exhibit allomorphy, in which case more than one realisation is listed. Under a morphome's functions are listed any morphosyntactic features which the morphome realises (cf Chs.6–7), as well as whether or not it functions derivationally. In the latter case, cross references indicate specific sections of the dissertation in which the functions are mentioned, or else examples in which they appear.

Morphomic label		Phonological form	Function
fABL	ablative	$_{R}$nàa, $_{R}$nàpa	CASE:ablative, A-TAM:prior (§7.2.1); derivational in place names (§3.12.6)
fADDICT	addict	$_{R}$mùŋuru	derivational (5.109)
fALL	allative	$_{R}$ɻiŋ, $_{R}$ruŋ	CASE:allative, A-TAM:directed, T-TAM directed (§7.2.1); derivational in place names (§3.12.6) and compass locationals (§3.10)

Morphomic label		Phonological form	Function
fANOTH	another	$_{\mathrm{R}}$jàrat̪, $_{\mathrm{D}}$jàrat̪	derivational (§3.13.6)
fAPPR	apprehensive	$_{\mathrm{L}}$ɲara	T-TAM:apprehensive (§7.2.1)
fASSOC	associative	$_{\mathrm{R}}$ŋ̀uru	CASE:associative (§7.2.1); derivational
fAWAIT-	awaiting	$_{\mathrm{R}}$ɻù	derivational (B.111)
fBORN	born	$_{\mathrm{R}}$ŋàt̪i	derivational in person names (§3.12.7)
fBOUND	boundary	$_{\mathrm{D}}$ŋurŋa	derivation in compass locationals (§3.10)
fCAUS	causative	$_{\mathrm{R}}$arma	derivational (B.7)
fCONS	consequential	$_{\mathrm{R}}$ŋàrpa, $_{\mathrm{D}}$ŋarpa, $_{\mathrm{D}}$ŋara	CASE:consequential, A-TAM:antecedent, T-TAM:antecedent; T-TAM:past (§7.2.1); derivational (3.79c)
fCONT	continuous	$_{\mathrm{R}}$iːc	derivational in compasss locationals (§3.10)
fCOMP	complementised	$_{\mathrm{L}}$pà	derivational in pronominal stems (§3.9)
fDAT-	dative	$_{\mathrm{R}}$màɻù	CASE:dative (§7.2.1)
fDEAR	dear	$_{\mathrm{R}}$pàʈa	derivational (§3.12.7)
fDEN-	denizen	$_{\mathrm{R}}$wìʈi	CASE:denizen (§7.2.1)
fDEPO-	deportmentive	$_{\mathrm{R}}$jàla	derivational (5.34d)
fDES	desiderative	$_{\mathrm{R}}$ta	T-TAM:desiderative (§7.2.1)
fDON-	donative	$_{\mathrm{R}}$wù, $_{\mathrm{L}}$wù	CASE:donative (§7.2.1); derivational (6.177)
fDU	dual	$_{\mathrm{D/I}}$kiarŋ	NUMBER:dual (§7.2.1); derivational (§3.12.6)
fEND	end	$_{\mathrm{R}}$iɲin	derivational in compasss locationals (§3.10)
fEXS	excessive	$_{\mathrm{R}}$mùt̪aɲ	derivational (§3.13.4)
fFACT-	factative	$_{\mathrm{R}}$ɻù	derivational (§3.2)
fFRM	from	$_{\mathrm{D/II,V}}$in	derivational in compasss locationals (§3.10)
fGEN	genitive	$_{\mathrm{R}}$kàraɲ	CASE:genitive (§7.2.1); derivational in place names (§3.12.6)
fGENLIG	genitive ligative	$_{\mathrm{R}}$pa	ligative morph (§3.12.8)
fHAIL	hail	$_{\mathrm{R}}$màli	derivational in compasss locationals (§3.10)
fHALL-	human allative	$_{\mathrm{R}}$càni	CASE:human allative, CASE:purposive (§7.2.1)
fINCH	inchoative	$_{\mathrm{R}}$wà, $_{\mathrm{D}}$wà	CASE:collative (§7.2.1); derivational (6.198)
fINY	‘*iny*’	$_{\mathrm{D/IV}}$iɲ̪	derivational (§3.13.4)
fINST	instrumental	$_{\mathrm{R}}$ŋùni	CASE:instrumental (§7.2.1)
fLADEN	laden	$_{\mathrm{R}}$tàlkuɻu	derivational (A.7c)
fLLOC	long locative	$_{\mathrm{D/II}}$kiː	CASE:collative (§7.2.1)
fLOC	locative	$_{\mathrm{D/I,II,V}}$ki	CASE:locative, A-TAM:instantiated, A-TAM:present, T-TAM:immediate, COMP:empathy (§7.2.1); derivational in place names (§3.12.6)
fLWR	lower	$_{\mathrm{R}}$wi	derivational (§3.13.5)

Morphomic label		Phonological form	Function
fMID	middle	$_{\text{D/II,IV}}$i, $_{\text{D/II/III/V}}$ì	CASE:purposive, CASE:subjective allative, CASE:subjective evitative (§7.2.1; 3.13.2); derivational (§3.13.1)
fN	nominaliser	$_{\text{R}}$n	T-TAM:progressive, T-TAM:nonveridical, T-TAM:antecedent (§7.2.1); derivational
fNEG	negative	$_{\text{R}}$naŋ	+NEGATIVE (§7.2.1)
fOABL-	objective ablative	$_{\text{R}}$wùla	CASE:objective allative (§7.2.1)
fOBL	oblique	$_{\text{I/III}}$in̪t̪a	CASE:oblique, A-TAM:continuous, A-TAM:emotive, T-TAM:hortative, COMP:plain (§7.2.1)
fOEVIT-	objective evitative	$_{\text{R}}$wàːlu	CASE:objective evitative (§7.2.1)
fORIG	origin	$_{\text{R}}$wàːɲ	CASE:origin (§7.2.1)
fPL	plural	$_{\text{L}}$pàlat̪	NUMBER:plural (§7.2.1)
fPLENTY	plenty	$_{\text{R}}$wùt̪iɲ	derivational (§3.13.6)
fPOSS	possessive	$_{\text{L}}$pàɲ	derivational in pronominal stems (§3.9); derivational (A.22x)
fPRIV	privative	$_{\text{R}}$wàri, $_{\text{D}}$wàri	CASE:privative, A-TAM:nonveridical, T-TAM:nonveridcal (§7.2.1); derivational (§3.12.5)
fPROP	proprietive	$_{\text{D}}$kuu, $_{\text{D}}$kuɭu	CASE:proprietive, A-TAM:future, T-TAM:potential (§7.2.1); derivational (§3.12.5)
fRATH-	‘*rath*’	$_{\text{R}}$ɻà	derivational (§3.13.5)
fRCP	reciprocal	$_{\text{R}}$n̪t̪ù, $_{\text{R̪}}$tù, $_{\text{R}}$ɲcù	derivational (§3.13.3)
fREM	remote	$_{\text{R̪}}$t	derivational in compasss locationals (§3.10)
fRES	resultative	$_{\text{R}}$irìɲ	T-TAM:resultative (§7.2.1)
fSAME	same	$_{\text{D/I,III}}$ic, $_{\text{R}}$ic	derivational (§3.12.8)
fUTIL	utilitive	$_{\text{R}}$màra	CASE:utilitive, A-TAM:functional (§7.2.1)
INC	increment	$_{\text{R}}$ɭ	empty morph (§3.12.1)
T	termination	$_{\text{R}}$ta, $_{\text{D}}$ka, a, ø	empty morph (§3.7)
TH	thematic	$_{\text{R̪}}$t, $_{\text{R}}$c	empty morph (§3.8.2)

4 Segmental phonology

This chapter investigates the segmental phonology of Kayardild in detail. In doing so, three main tasks will be the focus of attention: (i) establishing the basic facts of mappings between underlying and surface forms; (ii) identifying ways in which those phonological mappings depend upon morphological constituency; and (iii) identifying ways in which morphological constituency can depend upon the phonology. Detailed, constraint based analyses of phonological modifications are for the most part beyond the scope of the dissertation and will not be presented here. The chapter is structured as follows. Discussion begins in §4.1 with a review of research over the past three decades or so into the nature of interactions between morphology and phonology. The facts of consonant cluster modifications are examined in §4.2, and potential architectures for a phonological analysis are introduced in §4.3. Attention turns to hiatus resolution, and its integration into the analysis in §4.4. In §4.5, the analysis of phonologically sensitive allomorphy is discussed, together with its ramifications for other aspects of the analysis of Kayardild phonology, and with the combined challenges they present for an adequate theory of phonology–morphology interactions. The phonology of laminal consonants and vowels is examined in §4.6. Some short notes on post-lexical processes appear in Appendix A §A.6.

4.1 The relationship between phonology and morphology

For the field of generative phonology, the period stretching from the early 1980s to the advent of Optimality Theory was one which was characterised by vigorous research into the relationship between morphology and phonology. Several, related theories were advanced as part of a research program most often referred to as 'Lexical Phonology' (henceforth, LP). To this day, LP still furnishes many of the most useful concepts for framing a general discussion of the interaction between phonology and morphology. Its main proposals and findings are reviewed in §4.1.1. Since the advent of Optimality Theory (OT), interactions between morphology and phonology have played a less prominent role in the development of phonological theory, though in some areas new insights have been gained. A review of the principle ways in which those interactions have been treated in OT is presented in §4.1.2. In keeping with the topic of the chapter, discussion below will focus on segmental phonology.

4.1.1 Lexical phonology and its constraint based successors

We begin with an overview of Lexical Phonology. Reviews of LP, taken at different stages of its development and with varying emphases, can be found in Kaisse & Shaw (1985), Spencer (1991:105–19), Booij (2000) and Rubach (2008) among others.

A key observation within LP was that many phonological rules can be regarded as **cyclic**, that is, they apply whenever a morphological operation (typically, the concatenation of a morph with its base) applies. If more than one such operation applies, then more than one **cycle** of the rules applies. In addition, it was observed that cyclic rules apply to a phonological representation ϕ, if and only if the properties of ϕ relevant to the rule's application had been created (i) during the immediately preceding morphological operation, or (ii) during the application of a preceding cycle of phonological rules. This observation was formalised as the Strict Cycle Condition (Mascaró 1976): cyclic rules apply only in **derived environments**.

A second key observation was that often, different sets of rules would apply after different kinds of morphological operation. That is, phonology is sensitive to morphology not only in terms of when and where it applies, but in terms of which rules apply to which morphological structures. Notwithstanding that fact, it is not the case that languages treat every last morphological operation differently, rather morphological operations can be arranged into **strata**, with the same set of cyclic phonological rules available to apply to every operation in the stratum. In this sense, a stratum is much like an abstract, organisational node which relates sets of morphological operations to sets of corresponding phonological rules. Terminologically, one may refer to a stratum of morphological operations, or to a stratum of rules.

Two points regarding the organisation of strata have remained an object of disagreement throughout the history of LP and of its constraint based successors. Firstly, it is sometimes supposed that a stratum ought to contain a *coherent* class of morphological operations, e.g. compounding; or derivation; or inflection (Christdas 1987; Kiparsky 2000), and not a mixture of various types. Second, following the Affix Ordering Generalisation proposed by Seigel (1974) it has sometimes been supposed, that as a word is built from a root outwards, affixes should appear in such an order that those which are closest to the root trigger one set of rules, and only after that, and further away from the root, can affixes appear which trigger the next set, and so forth. Within the Lexical Phonology approach to morphology and phonology, this translates into the Level Ordering Hypothesis, that rules should apply from each stratum successively. Several languages furnish apparent counter-evidence to both the Affix Ordering Generalisation and level ordering, and in response to such evidence, Mohanan (1982) proposes a **loop** which allows word formation to return to an earlier stratum, while preserving the notion that by default, derivation proceeds successively through strata; Booij (1987) proposes that morphological operations are associated simply with a diacritic feature, which selects the stratum of rules which should subsequently apply, and no default ordering of strata is posited.

Returning to the notion of Strict Cyclicity, it can be noted that the formulation of an adequate definition of 'derived environment' has proven notoriously difficult. Kiparksy (1973a; 1982a; 1985; 1993) has attempted several formulations, which rely to different extents on definitions of environments *per se*, and on evolving assumptions regarding phonological representations, especially of underlying forms, though no truly satisfactory definition has been arrived at (Anderson 1992:244–49).

Although the notion of a derived environment is difficult to transpose into constraint based phonology, a number of sub-theories of OT have attempted to sustain insights gained from LP by retaining the proposal that phonologies are organised into multiple strata. The difference between these OT theories and LP, is that rather than a stratum of morphological operations being related to a set of rules, it is related to a constraint based grammar with its own constraint ranking. As morphological operations apply and build up a word, the intermediate stages are submitted to these strata of constraints. Prominent theories of this nature are Stratal Optimality Theory (Kiparsky 2000; to appear; Bermúdez-Otero to appear), Derivational Optimality Theory (Rubach 1997; 2000), and Co-phonology Theory (Orgun 1996; Inkelas & Zoll 2005; 2007).

As in LP, approaches differ in detail. With respect to level ordering for example, Stratal OT and Derivational OT view derivations as proceeding successively through each stratum, whereas Co-phonology Theory makes no such assumption. Another dimension of variation which opens up among constraint based, LP-like theories is whether morphological operations within the same stratum apply cyclically or in one 'fell swoop' — for example, if a word is comprised of four morphs m_1+m_2+m_3+m_4, in which the operations of adding of m_2 and m_3 both correspond to stratum S, then does one submit inputs *cyclically* to S, i.e., submit m_1+m_2, then add m_3 and submit again, or does one submit m_1+m_2+m_3 and apply all phonological modifications in one fell swoop? Within Stratal OT for example, Kiparksy (2000; to appear) has proposed the former and Bermúdez-Otero (to appear) the latter.

Before moving to OT approaches which dispense with LP-like assumptions, we can briefly review an LP-like model which has recently been proposed specifically for Australian languages. Baker & Harvey (2003) examine evidence from Ngalakgan and Warlpiri, two Australian languages with no demonstrable genetic relatedness to one another (or to Kayardild), and find evidence in both for a binary distinction between 'word level' and 'root level' phonological modifications. Moreover, this distinction corresponds in a predictable manner to morphological (non-)productivity. Baker & Harvey comment, '[w]e hypothesize that the theoretical constructs we propose for

Ngalakgan and Warlpiri will be applicable to a wide range of Australian languages, when sufficiently detailed accounts become available.' (2003:6). We have already seen in Ch.3 that Kayardild exhibits more than two classes of phonological modifications, and moreover that all of them can be found applying in association with productive, inflectional suffixes. To this extent, Kayardild can be recognised as an Australian language which does not conform to the binary model proposed for Ngalakgan and Warlpiri.

4.1.2 Optimality theory without LP-like assumptions

Although the interaction between morphology and phonology has played a less prominent role in standard Optimality Theory than in LP-like, OT sub-theories, it has not been entirely absent from theoretical discussions. A common assumption in standard OT is that the definition of certain constraints can make reference to morphological structure. Of note here are positional faithfulness constraints and contextual markedness constraints; anchoring constraints; and morphologically indexed constraints, which are described below.

The formal notion behind **positional faithfulness** and **contextual markedness** is that some constraints will be relativised so as to assign violations to given structures in certain environments only. Positional faithfulness constraints penalise mismatches between the input and output, specifically in positions of 'prominence' (more on which below). Contextual markedness constraints penalise certain surface structures, specifically within certain immediate environments. Positional faithfulness constraints which treat stems or roots as more 'prominent' than affixes have played a role in OT since its inception (McCarthy & Prince 1995; 1999; Beckman 1997; Casali 1997), while arguments for the necessity of affixal, and reduplicant-specific (contextual) markedness constraints have also been advanced (Padgett 1995; Walker 1998; Gouskova 2007). Whether stem/root faithfulness is employed or affix markedness, the effect is to place different sets of conditions upon roots/stems versus affixes. A consequence is that only those strings of segments which span the boundary between root/stem and affix will be affected by both sets of conditions, enabling specific effects to be focused at that boundary, effectively restricting some modifications to a morphologically derived environment. Analyses of this sort, particularly those which make use of stem/root faithfulness, have appeared steadily in the OT literature since the constraints were first proposed and continue to do so; recent analyses include Bradley (2007), Kula (2008), Steiner (2008), Anttila (2009), Cho (2009). An important observation though, is that this approach to replicating derived environment effects will work only so long as the derived environment of interest occurs at the boundary between roots/stems and affixes; boundaries between root+root or affix+affix will not be amenable to the same analysis.[1]

The **ANCHORING** constraint of McCarthy & Prince (1999) demands that elements at the left or right edge of one domain stand in correspondence with elements at the left

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[1] This fact is not often commented upon, though Wilson (2001:174) remarks on its significance for his theory of Targeted Constraints, noting that the existence of derived environment effects between root+root or affix+affix would present a non-trivial challenge to his account of cluster simplification, due to its reliance in part on root faithfulness.

or right edge of another.[2,3] Since the domains to which ANCHORING can refer include morphological constituents in the input and output, the constraint can be employed to hinder or prevent changes such as insertions and deletions from occurring at morphological edges.

Another family of constraints which brings morphological constituency to bear on phonology, are (morphologically) **indexed constraints** (Itô & Mester 1999; Pater 2000; Alderete 2001a). These constraints penalise structures only in certain morphological environments. Unlike morphological versions of positional faithfulness, indexed constraints are not bound to refer to 'prominent' morphological units, but can refer to any individual morph or class of morphs, including language specific classes (such as the dominant and recessive classes of suffixes in Japanese; Alderete 2001a). As such, indexed constraints can be used to emulate one important aspect of LP's strata: the association of certain phonological modifications with certain sets of morphological operations (so long as those morphological *operations* can be identified with morphological *constituents* to which indexed constraints refer).

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[2] McCarthy & Prince (1999) envisage ANCHORING as a replacement for the earlier theory of Generalised Alignment (McCarthy & Prince 1993), based on ALIGN constraints, though in practice this has not occurred. Like ANCHORING, ALIGN constraints allow for morphological domains and phonological domains to interact. Although it is not the focus of the current chapter, it is worth noting that in constraint based phonology the use of ALIGN constraints has largely supplanted the cyclic derivation of prosodic structure.

[3] A constraint with similar force is Casali's (1997) MAXMI 'every morpheme initial segment must have a correspondent in the output'.

In addition to suggesting new ways to relate phonological modifications to morphological structure, research in OT has also explored several analogues to the serial ordering which was present in LP. LP-based OT theories such as Stratal OT retain a degree of serial ordering between phonological modifications by virtue of their passing phonological representations through more than one constraint based grammar. Two other families of emulations and implementations of seriality can be identified within OT.

The first family is comprised of variants of OT in which output candidates are compared not only with their inputs, but also with one or more other representation, whether that be (i) a different output candidate, as in Sympathy Theory (McCarthy 1999; McCarthy 2003), Comparative Markedness (McCarthy 2002), and Targeted Constraint Theory (Wilson 2001); (ii) a different actual output, usually of a morphologically related form, as in Output-Output Correspondence (Benua 1995; 2000; Burzio 1996; Kenstowicz 1996); (iii) a potentially non-extant output, as in the case of the constraint NoNeutralization (Lorenz 1996; Kiparsky 2008); or (iv) different parts of a complex representation, as in Turbidity Theory (Goldrick 2001; van Oostendorp 2006). When output candidates are compared to other, actual or hypothetical, outputs or output candidates, or to complementary aspects of a complex representation, the OT grammar becomes **functionally serial** (Bermúdez-Otero to appear), because the modifications to one (part of a) representation rely upon modifications made to another, which must already be known. For reasons of space I will have little to say regarding these theories in the discussion of Kayardild phonology below; for critical reviews see Rubach (2000), Mascaró (2003), McCarthy (2007; 2008), Bermúdez-Otero (to appear), Kiparsky (to appear).

The second family is comprised of variants of OT in which representations are passed serially through the *same* grammar of constraints, multiple times over — such architectures are referred to as embodying Harmonic Serialism (HS; Prince & Smolensky 2004[1993]; McCarthy 2000; McCarthy 2007; McCarthy 2008). In order for the results of HS to be interestingly different to standard OT, it is typically assumed that output candidates in such architectures can only differ from inputs in terms of a minimal change, such as addition or deletion of a feature or segment (the exact formulation of these minimal changes remains an area of current research). Since output candidates can only be minimally different from inputs, each pass through the grammar produces only a step-wise modification to a representation. Multiple passes through the grammar result in accumulated step-wise changes to a representation, not unlike — but also, not identical to — what a standard OT grammar produces in one fell swoop. Importantly, the cycle of modifications will not run indefinitely. Due to certain properties of OT grammars, every derivation obtained through this step-wise approach will eventually **converge**, such that the winning output candidate is identical to the input (Moreton 2004), at which point the derivation can be considered complete. At the time of writing, research into HS is an area of growing interest in OT. A recent proposal by Wolf (2008; to appear) is that one of the minimal changes which can be made to an input to produce an output candidate is the performance of a morphological operation. In a HS architecture of this kind, one finds an interleaving of morphological and phonological operations which in some ways is reminiscent of LP.

With this theoretical background in place, let us now proceed to the Kayardild data.

4.2 Consonant cluster reduction

As we saw in Ch.3 above, there are three classes of phonological modifications which can apply to consonant clusters that form across the boundaries of underlyingly morphs. These classes were dubbed the 'regular', 'deleting', and 'leniting' phonologies. This section examines the empirical nature of each of those classes. The content of the modifications in each class is set out in §4.2.1, with some discussion in §4.2.2. The location within the word of those modifications is discussed in §4.2.3. For convenience, I will use the term 'cluster' below to refer to one or more consonants.

4.2.1 The content of modifications

The regular, deleting and leniting phonologies are discussed in turn in §§4.2.1.1–4.2.1.3.

4.2.1.1 The 'regular' phonology

Table (4.1) sets out for the 'regular' phonology the modifications which apply to consonant clusters that form across the boundary of adjacent morphs, m_1+m_2. A full set of examples, illustrating each combination in (4.1) is provided in Appendix A, §A.1. Blank cells in (4.1) reflect clusters on which no data is available.

(4.1) Simplification of consonant clusters across boundaries of morphs m_1+m_2 in the ‘regular’ phonology of Kayardild

	Final string in m_1	Initial C in m_2: t,ʈ	n,ɳ	ɻ	t̪	c	k	p	ŋ	m	j	w
a.	V, Vŋ, Vk	(see h.,i.)		Vɻ	Vt̪	Vc	Vk	Vp	Vŋ	Vm	Vj	Vw
b.	r, rŋ, rk	ʈ	rn	l	rt̪	rc	rk	rp	rŋ	rm	rj	rw
c.	ɻ, ɻk	ɻt	ɻn	ɻ	ɻt̪	ɻc	ɻk	ɻp	ɻŋ	ɻm	ɻj	ɻw
d.	l, lŋ, lk	lt	ln	l	lt̪	lc	lk	lp	lŋ	lm	lj	lw
e.	ɳ	ɳt	ɳ	l	ɳt̪	ɳc	ɳk	ɳp	ɳŋ	ɳm		ɳm
f.	n, ɲ	nt	n	l	n̪t̪	ɲc	nk	np	nŋ	nm	ɲ	nm
g.	c, t̪	t	n	l	t̪	c	k	cp	ɲ	ɲm	j	j

	Final string in m_1	Initial C/V in m_2: ʈ	ɳ	n	r	l	i
h.	V	Vʈ	Vɳ	Vn	Vr	Vl	
i.	Vŋ, Vk	Vʈ	Vɳ				*

*see §4.4

In Ch.2, §2.3, restrictions were discussed that apply to surface consonant clusters in Kayardild. The modifications of the regular phonology only produce surface clusters which comply with those restrictions. The following discussion outlines the other major patterns which can be identified in the outputs of the regular phonology.

It is conspicuous that in the regular phonology, underlying velars at the end of m_1 have absolutely no effect on the output: the segments themselves are always absent in the output, as are all features associated with them. As such, m_1 morphs ending in the sets of strings {V, Vŋ, Vk}, and, for each liquid L, {L, Lŋ, Lk} behave exactly alike in the regular phonology. Likewise, m_1 morphs ending in the two laminal plosives /t̪/ and /c/ behave identically, and m_1 morphs ending in the two non-retroflex, coronal nasals /n/ and /ɲ/ behave identically.[4]

Let us next consider questions of faithfulness (i.e., similarity between input and output clusters) more generally. In the regular phonology, it is simplest to describe the faithfulness of clusters at an m_1+m_2 boundary as follows. Any consonant which is initial in m_2 surfaces (*qua* segment; discussion of individual features continues below). Consonants from the end of m_1 may or may not surface, and has been discussed above, velars at the end of m_1 never surface.

In terms of individual features, most generalisations which exist in the data can be expressed as shown schematically in (4.2): features from the input, cluster final segment generally surface in association with the output, cluster final segment; features from the input, cluster initial segment generally surface in association with the output, cluster initial segment but faithfulness of the latter type typically ranks below faithfulness of the former type.

(4.2) General nature of faithfulness of features in the 'regular' phonology

	a.	b.	c.
Input cluster:	*a*	*a b*	*a b*
Output cluster:	*x*	*x*	*x y*

[4] A corollary of this observation is that attention to the regular phonology alone will not be sufficient to establish the underlying contrasts between morphs ending in {V, Vŋ, Vk}, {L, Lŋ, Lk}, {t̪ , c} or {n, ɲ}.

The two caveats to these generalisations are that input clusters containing an m_1-final velar act as if it were not there, and input clusters containing an m_1-final /ɲ/ act as if it were /n/. Table (4.3) summarises eleven of these patterns (the list is not exhaustive).

(4.3) Generalisations regarding faithfulness in the regular phonology

	Input	Faithfulness I→O	Overridden by[a]
a.	$C_{\_V}$	[±sonorant]	—
b.	$C_{\_V}$	[±liquid]	—
c.	$C_{\_V}$	[±trill]	—
d.	$C_{\_V}$	[+nasal]	—
e.	$C_{\_V}$	[±apical]	—
f.	[−son] $C_{\_V}$	[±coronal],[±dental]	—
g.	$C_{V\_}$	[±nasal]	b.
h.	$C_{V\_}$	[±liquid]	a., b.
i.	$C_{V\_}$	[±trill]	a., b., c.
j.	$C_{V\_}$	[±coronal]	f.
k.	$C_{V\_}$	[±laminal]	e., f.

[a] All generalisations are overridden by the fact that (i) m_1-final velars do not surface, and (ii) m_1-final /ɲ/ behaves like /n/

In table (4.3), cluster final consonants are referred to as $C_{\_V}$, i.e., consonants that precede a vowel, and cluster initial consonants as $C_{V\_}$, i.e., consonants that follow a vowel. Features from input $C_{\_V}$ regularly surface without qualification, while features from input $C_{V\_}$ tend to surface, but do so only if in doing so they do not disturb other, more highly ranked faithfulness patterns. For a concrete example of these faithfulness patterns in operation, we can take input clusters which end in a plosive, and input clusters which begin with a trill. Generalisation (4.3a) states that all input $C_{\_V}$ [±sonorant] features — the feature distinguishing plosives from non-plosives — survive in the output, and thus every cluster that ends with a plosive in the input also ends with a plosive in the output.

Generalisation (4.3i), states that all input $C_{V\_}$ [±trill] features survive in the output except at the expense of certain other generalisations including (4.3a), and thus *almost* every cluster that begins with a trill in the input also begins with a trill in the output. One exceptional case relates to input /r+ʈ/. Recall from Ch.2 that */rt/ and */rʈ/ surface clusters are strictly prohibited in Kayardild, so that /r+ʈ/ cannot surface as */rt/ or */rʈ/. The actual surface cluster is /ʈ/ — a cluster which conforms to generalisation (4.3a) but violates lower-ranked (4.3i).

A point to note is that the patterns of faithfulness listed in (4.3) cannot be reduced to preferences expressed in terms of output forms alone, since what is preferred is an output which resembles its input — for example, there is no general preference for output $C_{\_V}$ to be either [+sonorant] or [–sonorant], but there is a preference for it to share its [±sonorant] value with input $C_{\_V}$. Likewise, it is not possible in the general case to reduce the contextual conditions on input–output faithfulness to a matter of output configurations alone. To appreciate this, consider the scenario shown in figure (4.2b) above. The features whose faithfulness is more highly ranked are those associated with $C_{\_V}$ in the *input*, while the features whose faithfulness is less highly ranked are those associated with $C_{V\_}$ in the *input*. All features, if they surface, will be associated with $C_{V\_}$ (and with $C_{\_V}$) in the output, and so are not contextually distinguished there.

4.2.1.2 The 'deleting' phonology

Table (4.4) sets out for the 'deleting' phonology the modifications which apply to consonant clusters that form across the boundary of adjacent morphs, m_1+m_2. A full set of examples, illustrating each combination in (4.4) is provided in Appendix A, §A.2.

(4.4) Simplification of consonant clusters across boundaries of morphs m_1+m_2 in the ‘deleting’ phonology of Kayardild

	Final string in m_1	Initial C in m_2: k	w		Final string in m_1	Initial C in m_2: k	ŋ	j	w
a.	V	V		i.	lk	lk			
b.	r	r		j.	ɳ	ɳk			
c.	ɻ	ɻ		k.	n	nk			
d.	l	l	l	l.	ɲ	ɲc			
e.	rŋ	rŋk		m.	ŋ	ŋk			ŋ
f.	lŋ	lŋk		n.	c	c	c	c	c
g.	rk	rk		o.	t̪	t̪	t̪		t̪
h.	ɻk	ɻk		p.	k	k			

The content of modifications in the ‘deleting’ phonology can be analysed as follows.

The final string in morph m_1 always surfaces without alteration; the initial consonant of morph m_2 deletes, except that an m_2-initial plosive will surface if it is preceded by a nasal (this contextual condition could be interpreted in terms of either the input or the output). Sequences of laminal+velar are prohibited on the surface (Ch.2, §2.3), and input /k/ palatalises to /c/ after /ɲ/. This pattern could be expressed in terms of a general ranking of faithfulness in the deleting phonology, such that faithfulness to input $\mathrm{C}_{\mathrm{V}\_}$ place of articulation features takes precedence over faithfulness to input $\mathrm{C}_{\_\mathrm{V}}$ features.

Seen from this point of view, the key difference between the ‘regular’ and the ‘deleting’ phonology is one of faithfulness: in the former, segments from m_1 tend to delete and faithfulness to features from m_1 is ranked low, whereas in the latter segments from m_2 tend to delete and faithfulness to features from m_2 is ranked low. In both phonologies, forced deletions occur which are not independently motivated by surface phonotactic restrictions — in the regular phonology, /ŋ+k/ becomes /k/ even though /ŋk/

is an acceptable surface cluster; in the deleting phonology, /l+k/ becomes /l/ even though /lk/ is an acceptable cluster.

4.2.1.3 The 'leniting' phonology

Tables (4.5) and (4.6) set out for the 'leniting' phonology the modifications which apply to consonant clusters that form across the boundary of adjacent morphs, m_1+m_2. A full set of examples, illustrating each combination in (4.5) and (4.6) is provided in Appendix A, §A.3. Blank cells reflect unattested combinations.

(4.5) Simplification of consonant clusters across boundaries of morphs m_1+m_2 in the 'leniting' phonology of Kayardild, where m_2 is consonant initial

	Final string	Initial C in m_2											
	in m_1	ʈ	ɳ	ɻ	t̪	c	k	p	ɲ	ŋ	m	j	w
a.	V, Vk	Vɻ			Vj	Vj		Vw					
b.	r, rk					rj		rw					
c.	ɻ, rk							ɻw					
d.	l, lk							lw					
e.	rŋ												
f.	lŋ												
g.	ɳ							ɳp					
h.	n, ɲ							np					
i.	ŋ	ɳʈ				ɲc	ŋk	mp			m	j	w
j.	c							cp	ɲ				
k.	t̪	t	n	l		c		cp	n̪	nŋ	nm		j

(4.6) Simplification of consonant clusters across boundaries of morphs m_1+m_2 in the 'leniting' phonology of Kayardild, where m_2 is /i/-initial

Final C(C) in m_1	V	r	rŋ	rk	ɻ	ɻk	l	lŋ	lk	ɳ	n,ɲ	ŋ	c	t̪	k
+ initial /i/ in m_2	*	ri	rŋi	rki	ɻi	ɻki	li		lki	ɳi	ni	ŋi	ci	t̪i	ki

*see §4.4

The nature of modifications within the leniting phonology is much the same as in the regular phonology, with a few key, complicating differences.

As in the regular phonology, faithfulness to features from input $C_{\_V}$ tends to outrank faithfulness to features from $C_{V\_}$ (more on which below), and m_1-final /ɲ/ surfaces as /n/. Departing from the regular phonology, m_1-final velars can surface, although only if doing does not prevent input $C_{\_V}$ from surfacing faithfully.

Most noticeably, initial plosives in m_2 may lenite to a semivowel or to /ɻ/. Perhaps the simplest way to interpret this is that plosives lenite to the unique, [–continuant] segment with the same major place of articulation, and if possible, minor place of articulation, i.e., /p/ → /w/; /t̪, c/ → /j/; /ʈ/ → /ɻ/. They do so only when *not* preceded by a [+continuant] consonant. This can be expressed in terms of faithfulness and default surface structures as follows.

Firstly, the input $C_{\_V}$ feature [±liquid] always surfaces faithfully. Apart from the indirect effects of that though, (i) the [±continuant] values of m_1-final consonants surface faithfully — though only if the input segment which carries the feature also surfaces; and (ii) a surface, m_2 initial consonant is always takes on the [±continuant] value of its neighbouring consonant in the output, or if there is none, a default [–continuant] value. Table (4.7) summarises these and some other patterns (the list is not exhaustive).

(4.7) Generalisations in the leniting phonology

	Output	Output preference	Overridden by[a]
a.	any cluster	agree in [±continuant]	—
b.	C in m_1	=input [±continuant]	d.
c.	any C	[−continuant]	a., b.
	Input	**Faithfulness I→O**	**Overridden by[a]**
d.	$C_{\_V}$	[±liquid]	—
e.	$C_{\_V}$	[±nasal]	—
f.	$C_{\_V}$	[±apical]	—
g.	$C_{\_V}$	[±laminal]	—
h.	$C_{\_V}$	[±sonorant]	a., b., c.
i.	$C_{V\_}$	[±liquid]	d.

[a] All generalisations are overridden by the fact that m_1-final /ɲ/ behaves like /n/

4.2.2 Discussion of the content of modifications

This section offers some notes relating the empirical facts set out above to several issues of recent theoretical interest. Topics discussed are the treatment of segment 'fusion' in the regular and leniting phonologies (e.g. /c+w/ → /j/; /t̪+ɳ/ → /n/) in §4.2.2.1; (ii) the existence of chain shifts in the data (e.g. regular phonology /cm/ → /ɲm/ and /ɲm/ → /nm/) in §4.2.2.2; (iii) the status of m_1-final velars and m_1-final /ɲ/ in §4.2.2.3; and (iv) the deletion of $C_{\_V}$ in the deleting phonology in §4.2.2.4.

4.2.2.1 Cluster 'fusion'

As discussed in §4.2.1.1, there are many cases in the regular phonology (and also some in the leniting phonology) where an input cluster *ab* corresponds to a single output consonant *x*, where *x* is identical to neither *a* nor *b*, but carries features of both. There are two main approaches to modelling this kind of behaviour within a single pass through a constraint based grammar.

The first approach proposes that both of the input segments (*qua* segment) be forced into corresponding to one and the same output segment, violating the usual one-to-one mapping between input and output segments (Lamontagne & Rice 1995).[5] Since both input segments *a* and *b* map to output *x*, it is possible to employ a positional faithfulness constraint such as IDENT$_{C}$(F) to compel *x* to faithfully mirror, in terms of feature F, every one of its input correspondents which satisfy condition C. The approach will succeed so long as we can ensure that only one of the segments *a* and *b* satisfies condition C, so that the value of F maps from only one of *a* or *b* to *x*. A full discussion of whether this approach could be implemented for Kayardild is beyond the scope of the dissertation, but one difficulty in the offing can be mentioned. As Wheeler (2005) points out, once the analysis of fusion (*ab* → *x*) is adopted, in which multiple input segments are compelled to map to a single output in preference to simply deleting, it becomes potentially very complicated to model simple deletions, since for every mapping *ab* → *b*, the grammar by default prefers a fusion analysis over a deletion analysis.

The second approach to modelling apparent fusion within a single pass through a constraint based grammar relies on constraints of the type MAX(F), which demand that an underlying feature F have a correspondent in the output (Lombardi 1998). Ranking MAX(F) over MAX will allow one of the input segments *a* or *b* to delete, while its feature F still surfaces. For example, in /c+w/ → /j/ one could assume that /c/ deletes, but that its

[5] Technically, this is implemented by ranking the constraint MAX, which militates against input segments lacking output correspondents, over UNIFORMITY, which militates against many-to-one input–output correspondences.

laminal place feature survives at the expense of the labial place feature of /w/. As discussed in §4.2.1, in each phonology, features of $\mathrm{C}_{\_\mathrm{V}}$ tend either to survive in preference to, or to give way to, features of $\mathrm{C}_{\_\mathrm{V}}$. In the analysis of Kayardild then, use could be made of positional MAX constraints (Casali 1997; Yip 1999; Steriade 2009), of the specific type MAX(F)/$\mathrm{C}_{\_\mathrm{V}}$ and MAX(F)/$\mathrm{C}_{\mathrm{V}\_}$ (these are used for example in the analysis of Ngalakgan by Baker 2008).

Another approach to the analysis of apparent fusion is one which appeals to seriality. In a serial derivation, we can say that a feature F spreads between *a* and *b*, before one segment is deleted, as for example in /c+w/ → /cj/ → /j/, where the laminal place feature first spreads and then /c/ is deleted. Although there are no clear arguments in favour of the serial approach at this point, we will see below that several other mappings within the consonant cluster phonologies of Kayardild are also amenable to serial analyses, and that in some cases there are grounds for preferring those analyses over others.

4.2.2.2 Chain shifts

In amongst the various mappings of the regular phonology lies a **chain shift**: input /t̪m/ and /cm/ are output as /ɲm/, while input /ɲm/ is output at /nm/. Chain shifts are not normally derivable within a single layer of a constraint based grammar. The basic reason is that an OT grammar should only ever effect modifications if they improve the markedness of the output relative the input (measured relative to the constraint hierarchy), since any modification will by definition result in a decrease in faithfulness, and there must be some gain which more than counterbalances that loss. As such, if /ɲm/ maps to /nm/, then /nm/ must be less marked than /ɲm/. But if that is so, then it is odd that /cm/ maps to /ɲm/ rather than to /nm/ given that (i) output /nm/ is clearly permissible, and (ii) the improvement in markedness between /ɲm/ and /nm/ outweighs the loss of faithfulness. Although methods have been devised to circumvent this problem (Kirchener 1996; Lubowicz 2003), the formalism invoked (local constraint conjunction) is somewhat contentious within Optimality Theory, as is its application to the derivation of chain shifts (McCarthy 2007). On the other hand, chain shifts are easily modelled by serial derivations. If we state that the mapping of /ɲm/ → /nm/ *precedes* the mapping of /cm/ → /ɲm/, then there is no longer any expectation the /cm/ should map to /nm/. Indeed, as we will see in §4.2.2.3 next, there is good reason to suppose that the change /ɲ/ → /n/ does precede other modifications in the regular (and leniting) phonology.

4.2.2.3 Morph final velars and morph final /ɲ/

In both the leniting and the regular phonologies, a significant number of generalisations were stated with the proviso that /ɲ/ behaves as if it were /n/ in the input, and that (in the regular phonology) morph final velars behave as if they were absent in the input. Considerations of space preclude a full demonstration, but it is worth emphasising that the implementation of these provisos within a single pass through a constraint based grammar represents a decidedly non-trivial challenge. The reason is that the bulk of the generalisations in the regular and leniting phonologies are expressed in terms of faithfulness to input features, yet these provisos, which contradict and overrule those generalisations, state that the phonology is *not* faithful to morph final /ɲ/ or morph final velars. Although anti-faithfulness constraints have been proposed in OT (Alderete 2001a; 2001b), their incorporation into the grammar comes at the cost of certain formal properties that otherwise obtain in constraint based phonologies, and which are typically regarded as key strengths (Pulleybank 2006). Since it is not clear whether anti-faithfulness constraints are either justified or necessary, it will not be assumed here that an analysis of Kayardild should make use of them.

Setting aside anti-faithfulness, another strategy for simplifying the leniting and regular phonologies would be to ensure that underlying /ɲ/ actually has been converted to /n/, and underlying velars actually deleted at the point when the bulk of faithfulness constraints apply. This could be achieved by employing serialism, and ordering the modifications /ɲ/ → /n/ and /k, ŋ/ → Ø before all others.

4.2.2.4 The deletion of $C_{\_V}$ in the deleting phonology

In the deleting phonology, it is most often the case that input $C_{\_V}$ is deleted in the output. As an empirical fact this is interesting: $C_{\_V}$ deletes even if it is an obstruent. Wilson (2001) comments that the patterns of cluster reduction shown in (4.8a,b,c,f) are those which are generally attested cross-linguistically, while not those in (4.8d,e) are not — yet the patterns (4.8d,e) strongly characterise the deleting phonology.

(4.8) Typological tendencies

Input	Output			
$VObs_1Obs_2V$	a.	$VObs_2V$	d.	$*VObs_1V$
$VSon_1Obs_2V$	b.	$VObs_2V$	e.	$*VSon_1V$
$VObs_1Son_2V$	c.	$VSon_2V$	f.	$VObs_1V$

To be sure, the typological tendencies in (4.8) do often get overridden in languages by a countervailing tendency for $C_{V\_}$ in a root to be preserved while $C_{\_V}$ in a suffix is deleled

(Wilson 2001:173–75), but the deleting phonology in Kayardild often applies across morphological boundaries which are not ROOT+SUFFIX boundaries (cf §4.2.3 below).[6] In empirical terms then, the cluster modifications found in the deleting phonology are very rare. As a consequence of this though, they are also significant to certain theories of cluster simplification, such as Wilson's Targeted Constraint Theory (2001) and Steriade's P-Map (2001; 2009). Arguments in favour of these theories have been predicated in part upon their prediction that deletions of the type (4.8d,e) do not — and cannot — occur in natural languages. Given that deletions of the type (4.8d,e) do occur in Kayardild, it is possible that these theories will need to be amended in order to account for the Kayardild facts. Whether this can be achieved in a manner which permits other strengths of the theories to remain in tact is a question for future research.

4.2.3 The location of modifications

In order to gain a comprehensive overview of Kayardild phonology and its relationship to morphology, it will be important to attend not only to which modifications are made by the regular, deleting and leniting the phonologies, but also to where in the word they are made.

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[6] Nor can an appeal be made to prosody as a special factor: one might suppose for example, that $C_{\_V}$ deletes only in a weak prosodic position, but as discussed in Ch.5, §5.3.9, the contrast between the regular, deleting and leniting phonologies is independent of prosodic structure.

4.2.3.1 Cluster modifications apply only in derived environments

Since their introduction in Ch.3, phonological modifications to consonant clusters have been described as applying across morph boundaries. This section provides evidence to confirm that this is indeed the correct, empirical characterisation: modifications to consonant clusters occur only in morphologically derived environments.

When two morphs m_1+m_2 undergo modifications from the regular, deleting, or leniting phonology, only the cluster formed at their boundary is affected. Clusters which appear elsewhere in either of the two morphs are unaffected, as illustrated in (4.9) and (4.10).

(4.9) No modification to cluster inside m_1

a. Regular	b. Deleting	c. Leniting
kunybal-warri-	*jurrka-uu-*	*kakuju-walath-*
kuɲpalwari	curkauu-	kakucuwalat̪-
*kunpalwari	*curauu-	*kakuɟuwalat̪-
kuɲpalk-wari-	curka-kuu-	kakucu-palat̪-
root sp.-fPRIV-	mangrove sp.-fPROP-	uncle-fPL-
‘root sp.-PRIV’	‘mangrove sp.-FUT’	‘uncle-PL’

(4.10) No modification to cluster inside m_2

a. Regular	b. Deleting	c. Leniting
marral-dingkarr-	*kamarr-urrka-*	*bin-ngarrba-*
maraltiŋkar-	kamarurka-	pinŋarpa-
*maraltikar-	*kamarura-	*pinŋarwa-
maral-ʈiŋkar-	kamar-kurka-	pit̪-ŋarpa-
ear-long-	rock-fLOC.fOBL-	smell-fCONS-
‘long eared’	‘rock-PRES.COMP’	‘smell-CONS’

4.2.3.2 No evidence for level ordering

There is no evidence for level ordering or for an Affix Ordering Generalisation in Kayardild, in the sense that the regular, deleting and leniting phonologies are constrained to appear in any given sequence as one moves from left to right in the word. The examples in (4.11) illustrate consonant cluster modifications in each sequential combination, at successive morph boundaries, corresponding to the three phonologies.

(4.11) Regular, deleting and leniting phonologies apply freely to successive boundaries

a. Regular, Regular *dur-barr-barr-* ʈuɻparpar- ʈuɭ-par-par- faeces-weak-weak- ‘suffering diarhoea’	b. Regular, Deleting *thawurr-karran-ji-* t̪aurkaraɲci- t̪aur-karaɲ-ki- stream-fGEN-fLOC- ‘stream-GEN-INS’	c. Regular, Leniting *wura-nurru-walath-* wuɭanuruwalat̪- wuɭan-ɳuru-palat̪- food-fASSOC-fPL- ‘food-ASSOC-PL’
d. Deleting, Regular *kamarr-amarr-karrany-* kamaramarkaraɲ- kamar-kamar-karaɲ- ‹stone-stone›-fGEN- ‘‹gravel›-GEN’	e. Deleting, Deleting *kamarr-uru-y-* kamaruɭuj- kamar-kuɭu-ki- stone-fPROP-fLOC- ‘stone-FUT-EMP’	f. Deleting, Leniting *maku-wuru-walath-* makuuɭuwalat̪- maku-kuɭu-palat̪- ‹woman-fPROP›-fPL- ‘‹married›-PL’
g. Leniting, Regular *kuna-wala-nurru-* kunawalanuru- kuna-palat̪-ɳuru- child$_{\text{NL}}$-fPL-fASSOC- ‘children-ASSOC’	h. Leniting, Deleting *jalji-walath-urrka-* calciwalat̪urka- calci-palat̪-kurka- shade-fPL-fLOC.fOBL- ‘shade-pl-PRES.COMP’	i. Leniting, Leniting *bardi-wardi-walath-* paʈiwaʈiwalat̪- paʈi-paʈi-palat̪- ‹whisker-wh.›-fPL- ‘‹Lardil man›-PL’

In terms their application to boundaries between roots and suffixes, all three phonologies can be found applying to ROOT+ROOT, ROOT+SUFFIX and SUFFIX+SUFFIX boundaries; the regular phonology also applies across SUFFIX+ROOT boundaries. Cross-references to examples of each of these are listed in (4.12).

(4.12)

	ROOT+ROOT	ROOT+SUFFIX	SUFFIX+SUFFIX	SUFFIX+ROOT
Regular	(4.11a)	(4.11d)	(4.11g)	(3.81)
Deleting	(4.11d)	(4.11e)	(4.11h)	NOT ATTESTED
Leniting	(4.11i)	(4.11h)	(4.11c)	NOT ATTESTED

The fact that cluster modifications (i) apply in derived environments, but (ii) are not restricted, for example, just to ROOT+SUFFIX environments means that the most common device employed in OT for producing derived environment effects — i.e., the use of positional faithfulness defined in terms of roots or stems, or contextual markedness defined in terms of affixes — will not suffice in Kayardild. Alternatives will be discussed in §4.3 next.

4.3 Architectures for Kayardild cluster phonology — preliminary models

This section considers several phonological architectures in terms of which Kayardild's consonant cluster phonologies might be analysed.

In the foregoing discussion of the regular, deleting and leniting phonologies, some central points emerged which these architectures will need to address. Firstly, all of the consonant cluster modifications occur solely in derived environments. Secondly, there is no evidence for level ordering or for an Affix Ordering Generalisation in Kayardild. Thirdly, underlying /ɲ/ acts like /n/ except in the deleting phonology, and final velars act as if they were absent in the regular phonology; statements which can be made about the individual cluster modifications, can be made with the greatest generality if the behaviour of morph final /ɲ/ and morph final velars has already been handled in some way.

During the ensuing discussion the aim will not be to arrive at a definitive architecture for the phonology of Kayardild, given that we have not yet examined the phonology of hiatus resolution or of vowel–laminal interactions, rather the purpose is to identify some pertinent issues of analysis within the context of a data set which is non-trivial, yet still small enough for significant details to be attended to manageably. We begin by considering models of the constraint-based LP-like type, before proceeding to others.

4.3.1 A cyclic multistratal architecture

In the first model to be considered, the phonology of Kayardild will be assumed to possess three strata, each of which on their own induces the phonological modifications corresponding to the 'regular', 'deleting' or 'leniting' phonologies. They will be referred to mnemonically as the R-stratum, D-stratum and L-stratum respectively.

The architecture is cyclic, in the sense that words are elaborated one morph at a time, with the result submitted on each occasion as the input to a stratum which consists of a constraint based grammar. The output from that stratum then provides the base to which the next morph is appended. Because at any point, any stratum could be selected by a given morph, it will be assumed that morphs are associated with a 'stratal diacritic' of the kind mentioned in §4.1, proposed by Booij (1987).

Some remarks regarding stratal diacritics. As discussed in Ch.3 the class of consonant cluster modifications which a given morph undergoes may vary from one context to another — in terms of the model begin proposed here then, that morph associates in different contexts with different stratal diacritics. Some examples are shown in (4.13)–(4.16); the stratal diacritic of each non-initial morph is indicated in the underlying representation by way of a subscript to the morph's left.

(4.13)	a.	*yarbu-nyarrba-*	b.	*buru-th-arrba-*
		jaɻpuɲarpa-		puɻut̪arpa-
		*jaɻput̪arpa-		*puɻuɲarpa-
		jaɻput̪-$_{\text{R}}$ŋarpa-		puɻu-t̪-$_{\text{D}}$ŋarpa-
		animal-fCONS-		gather-TH-fCONS-
		'animal-CONS'		'gather-Ø-PRECOND'

(4.14)	a.	*yarbu-yarri-*	b.	*buru-th-arri-*
		jaɻpujari-		puɻut̪ari-
		*jaɻput̪ari-		*puɻujari-
		jaɻput̪-$_{\text{R}}$wari-		puɻu-t̪-$_{\text{D}}$wari-
		animal-fPRIV-		gather-TH-fPRIV-
		'animal-PRIV'		'gather-Ø-NEG.ACT'

(4.15)	a.	*jardi-balarr-*	b.	*balarr-walarr-*
		caʈipalar-		palarwalar-
		*caʈiwalar-		*palarpalar-
		caʈi-$_{\text{R}}$balar-		palar-$_{\text{L}}$palar-
		back-white-		white-white-
		'termite'		'egg white'

(4.16)	a.	*bardi-bardi-*	b.	*bardi-wardi-*
		paʈipaʈi-		paʈiwaʈi-
		*paʈiwaʈi-		*paʈipaʈi-
		paʈi-$_{\text{R}}$paʈi-		paʈi-$_{\text{L}}$paʈi-
		whisker-whisker-		whisker-whisker-
		'shell sp.'		'Lardil man'

Important for the current discussion is the fact that stratal diacritics will always be provided to the phonology by external sources; the phonology itself will never have to calculate what a morph's stratal diacritic ought to be. The external sources of that information are (i) the lexicon, in the case that the morph is part of a lexical stem (cf Ch.3, §3.3.3); and (ii) the inflectional morphology in the case that the morph is inflectional or is the termination T (on which, see Ch. 7).

To take a concrete example of a word's derivation within the current architecture, consider the word *nathardangkawuruwalathina* in (4.17). It contains six overt morphs, with at least one pair of adjacent morphs undergoing modification by each of the three phonologies. The representation which the phonology would process, and the providence of its various parts, is shown in (4.18).

(4.17) *natha-rdangka-wuru-walath-i-na-*
ɳa̪t̪aʈaŋkauɻuwalat̪inaa
ɳa̪t̪a-$_{\mathrm{R}}$ʈaŋka-$_{\mathrm{D}}$kuɻu-$_{\mathrm{L}}$palat̪-$_{\mathrm{D}}$ki-$_{\mathrm{R}}$naa-ø
‹camp-man-fPROP›-fPL-fLOC-fABL-T
'married woman-PL-Ø-ABL-T'

(4.18) ɳa̪t̪a-$_{\mathrm{R}}$ʈaŋka-$_{\mathrm{D}}$kuɻu-$_{\mathrm{L}}$palat̪-$_{\mathrm{D}}$ki-$_{\mathrm{R}}$naa-
from the lexical stem entry — from the inflectional morphology

The step by step derivation of *nathardangkawuruwalathina* in the cyclic, multistratal model is summarised in (4.19). At each step, the stratal diacritic of the most recently added morph determines which stratum the input is sent to. The output from one step, together with the addition of one more morph, forms the input to the next.

(4.19) Derivation of /ɳat̪a-$_{R}$ʈaŋka-$_{D}$kuɻu-$_{L}$palat̪-$_{D}$ki-$_{R}$naa-ø/ in the cyclic, multistratal architecture

Step	Input	Stratum	Output
1.	ɳat̪a +ʈaŋka	R	ɳat̪aʈaŋka
2.	ɳat̪aʈaŋka +kuɻu	D	ɳat̪aʈaŋkauɻu
3.	ɳat̪aʈaŋkauɻu +palat	L	ɳat̪aʈaŋkauɻuwalat̪
4.	ɳat̪aʈaŋkauɻuwalat̪ +ki	D	ɳat̪aʈaŋkauɻuwalat̪i
5.	ɳat̪aʈaŋkauɻuwalat̪i +naa	R	ɳat̪aʈaŋkauɻuwalat̪inaa

In an architecture of this type, a method must be found to ensure that at each pass though a stratum, phonological modifications apply only in the correct location, namely in the morphologically derived environment at the boundary between the most recently added morph and its base. To meet this requirement, let us assume that the phonology within each stratum is able to distinguish for each segment, whether it belongs to the most recently attached morph, which I will refer to as an **appendix**,[7] or to its **base**. Note that in the general case the base is not a true morphological constituent, but merely the output from the previous cycle. Particularly once we begin to consider other architectures it will be useful to have a label for these phonologically relevant units, and they will be referred to here as **pseudo-morphological** constituents, abbreviated as ψ.

We can now consider how a stratum constructed along these lines might work, taking as an example the D-stratum, which effects the 'deleting' phonology.

[7] A term such as 'suffix' would be inappropriate here, since in cases involving compounding and reduplication, the most recently attached morph may actually be a root.

In the deleting phonology the appendix-initial consonant is deleted, unless it is a non-sonorant (i.e., a plosive) preceded, in the base, by a nasal. This can be expressed in constraint based terms as follows. An undominated constraint (4.20) demands that all base segments in the input appear in the output. Constraints (4.21) and (4.22), which rank lower than (4.20) militate against most cluster types that contain both base segments and appendix consonants. In order to satisfy (4.21) and (4.22) without violating (4.20), offending segments in the appendix will fail to be preserved in the output. Finally, (4.23) ranks lower yet, ensuring that in cases where their appearance would not violate (4.21) and (4.22), segments in the appendix do surface. The ranking of (4.20)–(4.23) is summarised in (4.24).

(4.20) MAX-Seg/BASE
An input segment in the base has a correspondent in the output.

(4.21) $^{*}\mathrm{Seg}_{\mathrm{BASE}}\mathrm{C}_{\mathrm{APPX}[-\mathrm{son}]}$
In the output a base segment is not followed by a non-sonorant appendix consonant.

(4.22) $^{*}\mathrm{Seg}_{\mathrm{BASE}[-\mathrm{nas}]}\mathrm{C}$
In the output a non-nasal base segment (whether vowel or consonant) is not followed by an appendix consonant.

(4.23) MAX-Seg
An input segment has a correspondent in the output.

(4.24) || MAX-Seg/BASE » $^{*}\mathrm{Seg}_{\mathrm{BASE}}\mathrm{C}_{\mathrm{APPX}[-\mathrm{son}]}$, $^{*}\mathrm{Seg}_{\mathrm{BASE}[-\mathrm{nas}]}\mathrm{C}$ » MAX-Seg ||

In the sketch just provided, constraints which make reference to the base and appendix are the main drivers of the deleting phonology. That outcome accords with our expectations:

we know that modifications made by the deleting phonology apply only in derived environments at morphological boundaries, and not elsewhere, and thus reference to those boundaries must play a central role.

To summarise, the cyclic multistratal model manages to apply the correct modifications in the correct places in words: (i) by processing words one morph at a time, hence focussing on one morphological boundary at a time; (ii) by splitting an input to a stratum into a base and an appendix, thus providing that the only pseudo-morphological boundary that exists in each cycle corresponds to the left boundary of the most recently added morph; (iii) by focusing modifications within a stratum on segmental strings which span from the base to the appendix; and (iv) submitting inputs to the appropriate stratum based on the stratal diacritic of the most recent added morph.

Because this architecture submits just one new morph at a time to a phonological stratum, it is compatible with a model of phonology–morphology interaction in which the morphology itself builds up words one morph at a time, always submitting the result to the phonology and receiving back an output before adding anything further. In all of the other architectures to be examined below this will not be the case: the remaining architectures are all designed specifically to process multiple, added morphs at once. Some of the architectures will even fail if they do not have access to the entire word at the outset. Although this is not the place to present a complete argument, it can be mentioned now that the need for the phonology to have access to the entire word at the outset is not problematic. In Ch.7, §7.4.1 it will be argued that in fact the output of the inflectional morphology *must* be computed in its entirety before being passed to the phonology, that is, it is not possible in Kayardild to inflectionally realise morphosyntactic features one by one, submitting the results to the phonology each time. If we add to this the fact that lexical stems are stored in their entirety anyway (Ch.3), then we see that a fully inflected word — both its stem and its inflections — will need to be assembled by the inflectional morphology before being passed on to the phonology.

4.3.2 A fell-swoop multistratal architecture

The cyclic model outlined above always submits to a phonological stratum a string which has just been elaborated via the addition of one morph. A variation on that is a model in which the strings submitted may have had multiple morphs added, provided that they all carry the same stratal diacritic. For example, the form *dathinkiyarrngkiri* in (4.25) would undergo the derivation shown in (4.26) under the cyclic model above, but (4.27) under the fell-swoop variant to be considered now.

(4.25) *dathin-kiyarrng-ki-ri-*
ʈa̪t̪inkiarŋkiɻi
ʈa̪t̪in-ᴅkiarŋ-ᴅki-ʀɻi
that-fDU-fLOC-fALL.T
'that-DU-Ø-DIR'

(4.26) Derivation of /ʈa̪t̪in-ᴅkiarŋ-ᴅki-ʀɻi/ in the cyclic, multistratal architecture

Step	Input	Stratum	Output
1.	ʈa̪t̪in +kiarŋ	D	ʈa̪t̪inkiarŋ
2.	ʈa̪t̪inkiarŋ +ki	D	ʈa̪t̪inkiarŋki
3.	ʈa̪t̪inkiarŋki +ɻi	R	ʈa̪t̪inkiarŋkiɻi

(4.27) Derivation of /ʈa̪t̪in-$_D$kiarŋ-$_D$ki-$_R$ɻi/ in the fell swoop, multistratal architecture

Step	Input	Stratum	Output
1.	ʈa̪t̪in +kiarŋ +ki	D	ʈa̪t̪inkiarŋki
2.	ʈa̪t̪inkiarŋki +ɻi	R	ʈa̪t̪inkiarŋkiɻi

Permitting two or more new morphs to be added to the string submitted to a stratum complicates the task which the stratum must complete: rather than focussing modifications on one location, it must now focus them on potentially many locations. Previously, it was possible to identify boundaries indirectly by dividing inputs into a base and an appendix, and then referring specifically to strings of segments, of which some belonged to the base, and some to the appendix. That same indirect method will no longer suffice, since now there are boundaries which consist entirely of appendix segments. Neither will it suffice just to target strings which *end* in appendix segments, since this would also catch strings that are entirely internal to appendices, which should not be targeted. What is required is a method for distinguishing between (i) strings of segments which belong entirely to the base or entirely to just one appendix; versus (ii) those which do not. Only strings in the second category should be susceptible to modification. Let us suppose then, that the phonology is provided with a pseudo-morphological representation of its input, such that the base and each appendix are visible as separate ψ constituents. The deleting phonology can then be expressed in constraint based terms as follows.

The undesirability of certain clusters at boundaries will be expressed by demanding that some segmental strings be ψ-internal, by way of constraints such as (4.28) and (4.29), that are undominated. In order to ensure that the satisfaction of (4.28) and (4.29) is enforced by failing to preserve appendix-initial consonants, some way must be found of expressing the fact that the preservation of ψ-final segments is more highly valued that the preservation of ψ-initials. One way to achieve this is by ranking constraint (4.30) over (4.31). The ranking of (4.28)–(4.31) is summarised in (4.32).

(4.28) COMMON-ψ(SegC$_{[-\text{son}]}$)
In the output any segment and following non-sonorant consonant must occupy the same ψ constituent.

(4.29) COMMON-ψ(Seg$_{[-\text{nas}]}$C)
In the output any non-nasal segment and following consonant must occupy the same ψ constituent.

(4.30) R-ANCHOR-IO(ψ)
The segment which is at the right edge of a ψ constituent in the input is at its right edge in the output (i.e., no deletion at the right edge of ψ).

(4.31) MAX-Seg
An input segment has a correspondent in the output.

(4.32) || COMMON-ψ(SegC$_{[-\text{son}]}$), COMMON-ψ(Seg$_{[-\text{nas}]}$C), R-ANCHOR-IO(ψ) » MAX-Seg ||

As we see, just one of the constraints used in §4.3.2 above is still in use here (namely, MAX-Seg). The change of assumptions regarding the pseudo-morphological input to a stratum has changed the analysis within the stratum considerably.

4.3.3 A monostratal architecture with indexed constraints

Inkelas & Zoll (2007) observe that most multistratal, constraint based architectures can be transposed into monostratal architectures via the use of indexed constraints. This section explores the application of such a monostratal architecture to the analysis of Kayardild.

In the architectures above, stratal diacritics were used in order to decide which stratum, in a multistratal architecture, an input should be submitted to. Those inputs however, did not contain stratal diacritics as part of their representation; nor were the individual constraints within a given stratum sensitive to the existence of stratal diacritics. In a monostratal model the same diacritics can be used, but this time as a part of the input representation. Indexed constraints will then be sensitive to the stratal diacritic attached to the morph with which any given segment is affiliated. This enables indexed constraints to evaluate segments in a 'D' morph differently from those in an 'L' morph for example. If this approach is taken, then the basic workings of the two models above can be transposed into just a single, monostratal OT grammar. Entire words will pass through just one stratum, all at once. That stratum will enforce modifications from all three of the regular, deleting and leniting phonologies. To take an example, constraints which effect modifications from the deleting phonology would function along the following lines.

Constraints (4.33) and (4.34) state that combinations of certain segments *x*, plus other segments *y*, must occupy the same morph[8] if *y* is in a 'D' morph (i.e., one which bears a 'D' diacritic). The constraints will militate against unwanted strings across the left-hand boundary of a 'D' morph, while leaving within-morph strings, and strings which span other boundary types, unpenalised. Constraint (4.35) then promotes the preservation of segments immediately preceding a 'D' morph. Together with (4.33) and (4.34) it will ensure that unwanted clusters are avoided, and in manner which preserves

[8] In this architecture, constraints in the stratum will refer directly to actual morphs μ, rather than to the pseudo-morphs ψ employed in previous architectures.

the final segments of the morph before the ‘D’ morph. Finally, lower ranked (4.36) ensures that segments from D-morphs do surface so long as the structures they occupy do not incur violations of (4.33)–(4.35). The ranking of constraints (4.33)–(4.36) is summarised in (4.37).

(4.33) COMMON-μ(Seg$C_{D,[-son]}$)
In the output any segment, and a following non-sonorant consonant in a D-morph, must occupy the same morph.

(4.34) COMMON-μ($Seg_{[-nas]}C_D$)
In the output any non-nasal segment, and following consonant in a D-morph, must occupy the same morph.

(4.35) MAX-Seg/_Seg_D
An input segment has a correspondent in the output if it is adjacent on the right to a segment in a D morph.

(4.36) MAX-Seg
An input segment has a correspondent in the output.

(4.37) || COMMON-μ(Seg$C_{D,[-son]}$), COMMON-μ($Seg_{[-nas]}C_D$), MAX-Seg/_Seg_D » MAX-Seg ||

4.3.4 A bi-stratal architecture that captures phonological feeding

So far we have entertained multistratal architectures in which the separation between strata is imposed in order to keep apart different classes of phonological modifications that apply to different classes of morphological structures. In §4.3.3, a monostratal model transposes a separation *between* strata into a separation of constraints *within* a single stratum through the use of constraint indexing. So far though, none of the three architectures has made use of strata in order allow the phonological output of one set of modifications to crucially feed into the input of another. In Kayardild, this kind of feeding relationship could be put to good use in accounting for the behaviour of morph-final /ɲ/ in the leniting and regular phonologies, and morph final velars in the regular phonology. Let us first consider an augmented version of the monostratal model of §4.3.3.

The monostratal model of §4.3.3 can be augmented by adding an early stratum which converts /ɲ/ to /n/, and deletes velars in appropriate environments. Its output then becomes the input to the main stratum, which derives all other modifications. Like the one stratum in §4.3.3, the two strata of the bi-stratal model take as their input an entire word, in which each morph is visible and carries a 'stratal diacritic'.

In the early stratum, constraint (4.38) bars any segmental string *xy* where *x* is a velar, *x* and *y* occupy different morphs, and *y* occupies an 'R' morph: that is, an 'R' morph cannot be immediate preceded by a velar. Constraints (4.39) and (4.40) likewise bar any segmental string *xy* where *x* is /ɲ/, *x* and *y* occupy different morphs and *y* occupies an 'R' or 'L' morph: that is, an 'R' or 'L' morph cannot be immediate preceded by /ɲ/. Other constraints will be required to ensure that velars delete (as opposed to becoming apicals for example) and that /ɲ/ surfaces as /n/. Although the exact formulation of these need not detain us here, we can note that a crucial advantage of positing an early stratum is that the constraints required within it, whatever they are, will not run the risk of conflicting fatally with other constraints that apply in the same morphological environment in the main stratum.

(4.38) Common-μ($C_{[-\text{coronal}]}Seg_R$)
In the output any non-coronal consonant, and a following segment in an R-morph, must occupy the same morph.

(4.39) Common-μ($ɲSeg_R$)
In the output any /ɲ/, and a following segment in an R-morph, must occupy the same morph.

(4.40) Common-μ($ɲSeg_L$)
In the output any /ɲ/, and a following segment in an L-morph, must occupy the same morph.

4.3.5 Harmonic serialism

A question of some contemporary theoretical interest is whether one could successfully analyse the three phonologies of cluster modification in Kayardild within a harmonically serial architecture. As was pointed out in §4.2.2, a number of aspects of the modifications beyond just the behaviour of morph final velars and /ɲ/ are potentially troublesome for a non-serial analysis and would be amenable to an analysis involving serialism. However, arguments regarding the success or otherwise of harmonically serial analyses can become highly intricate and involve many additional considerations beyond those of a traditional OT analysis. Furthermore even the most well developed HS architecture currently available (OT with Candidate Chains; McCarthy 2007) is in its infancy, with many basic issues still to be resolved. An attempt at such an analysis is well beyond the scope of this dissertation, nevertheless any future application of HS to the analysis of Kayardild would be welcome, and quite possibly informative for the theory. In §4.5.2 below I do offer one comment regarding some recent research into HS and morphological realisation.

4.3.6 Phonological feeding in multistratal models

Let us return now to consider how one might augment the multistratal models in §§4.3.1–4.3.2, so that ordering between strata works to simplify issues of faithfulness in the regular and leniting phonologies. We can assume for present purposes that this will be achieved by ordering an 'early regular' stratum (R_E) before the 'main regular' stratum (R_M), and similarly an 'early leniting' stratum (L_E) before the 'main leniting' stratum (L_M). When this is done within the general multistratal architecture set out in §§4.3.1–4.3.2, a complication will arise which was not relevant in the bi-stratal model considered above. Namely, because the multistratal models rely on the notion of 'most recently added morph(s)' to identify boundaries at which modifications take place, if morphs m_1 and m_2 are concatenated for the input of the R_E-stratum for example, then by the time they are output and subsequently submitted to the R_M-stratum, m_2 will no longer be 'most recently added' and without some change in assumptions, the m_1+m_2 boundary will not be visible to the phonology.

One solution to this problem would be to declare that the visibility of boundaries persists from 'early' to 'main' strata.[9] Although this is certainly one avenue which could be explored, the empirical facts of Kayardild also present another option.

The 'early' strata do not actually enforce modifications *across* morph boundaries. Rather, they convert morph final /ɲ/ to /n/ and delete morph final velars; the content of

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[9] That declaration would correspond closely to the Bracket Erasure Convention in LP (Kiparsky 1982b), which states that boundaries between morphs remain visible to multiple phonological processes, if those processes occupy the same stratum.

adjacent morphs is never important. As such, it would be possible to submit morphs to the 'early' strata R_E and L_E without having concatenated them with their neighbours. Specifically, any morph which within the word precedes an 'R' morph could be submitted, on its own, to the R_E stratum, where final /ɲ/ is converted to /n/ and final velars are deleted; any morph which within the word precedes an 'L' morph could be submitted, on its own, to the L_E stratum, where final /ɲ/ is converted to /n/. One comment is in order though. If the R_E and L_E strata take individual morphs as their input, then the modifications which they effect are not cyclic — they do not apply in derived environments. The existence of non-cyclic strata interleaved with cyclic strata has been proposed in LP (Halle & Mohanan 1985; Mohanan 1986), and Kayardild can be considered a language which, in the context of such theories, appears to motivate that kind of stratum.

4.3.7 Summary and discussion

Six architectures have been considered in terms of which the consonant cluster modifications of Kayardild might be analysed. At this stage, facts pertaining to hiatus resolution and vowel–laminal interactions are yet to be considered, as are facts related to phonologically sensitive allomorphy. All of these will have some bearing on the feasibility of the architectures when they are considered below.

Setting aside the harmonically serial architecture, about which little of detail was said, of the five other models, all require reference within their strata either to pseudo-morphological (ψ) or actual morphological (μ) constituents. All five also require morphs to bear stratal diacritics 'D', 'L' or 'R' — whether these diacritics are used purely in order to choose which stratum to submit an input to, or whether they comprise part of the actual input to a stratum. Only one of the five architectures (§4.3.3) was monostratal. Two architectures employed multiple strata purely to keep apart different classes of modifications (§4.3.1, §4.3.2); one employed multiple strata solely to derive phonological feeding (§4.3.4) (this would also be true of a HS model, §4.3.5); and one (§4.3.6) employed multiple strata to both ends. Of greatest interest in terms of the wider goals of the dissertation though, is the observation that all of the architectures rely upon precisely the same information from external sources: a word divided into morphs of which all but the first carries a stratal diacritic. This is an important point, as it indicates that it ought to be possible to conduct a coherent investigation into the nature of other components of the grammar which interface with the phonology, without having precisely ascertained the internal structure of the phonology itself. This will be particularly useful in Ch.7 when discussion turns to the question of how morphosyntactic information is mapped by the inflectional morphology onto representations which can then be realised by the phonology. We already know that what the inflectional morphology must produce is a word, divided into morphs, which carry stratal diacritics.

4.4 Hiatus resolution

This section surveys the facts of hiatus resolution in Kayardild, and discusses the feasibility of integrating them into the phonological architectures introduced in §4.3.

4.4.1 The content of modifications

Under most circumstances, surface sequences of vowels of which the second is a front vowel /i/ or /iː/ are not tolerated in Kayardild. As a consequence, underlying /V+i/ and /V+iː/ rarely surface faithfully. In addition, sequences /V+ki/ which are subjected to modifications in the deleting phonology rarely surface as /Vi/ (once /k/ as deleted), and sequences /Vŋ+i/ which are subjected to modifications in the regular phonology rarely surface as /Vi/ (once /ŋ/ is deleted).

One factor which affects how some inputs surface, is the ban from Kayardild surface structures of any long vowel followed by another vowel. Thus for example, even in cases where the high vowel in a /Vː+i/ input does surface, we will not find the sequence /Vːi/ in the output — although as we will see, it is possible for the total mora count of the input sequence to be preserved , in an output of the form /Viː/.

As mentioned in Ch.3, there are no fewer than five 'vowel hiatus phonologies' in Kayardild. The complexity of the modern system stems diachronically from the uneven morphologisation of a set sound changes which can be reconstructed as having occurred in late proto Tangkic (pT) and which most likely took the form shown in (4.41), changing from state A > state B, then B > C, then C > D; (Round in prep.-a).

(4.41) Three sound changes in proto Tangkic.

	A		B		C		D
a.	*ui /_C	>	*iː				
b.	*ui /_V			>	*uj		
c.	*ai /_C			>	*aj	>	*a
d.	*ai /_$_{\beta}$][10]			>	*aj	>	*aː
e.	*ai /_V			>	*aj		

These changes gave rise to paradigms with odd alternations. Consider the pT locative which would have changed from the earlier, transparently regular 'pT, A' stage in (4.42) to later 'pT, D'. After the break up of proto Tangkic, the pT D paradigm was levelled in both the Southern and Northern branches, but in different directions, as shown in (4.42), represented by Kayardild (Southern Tangkic) and Lardil (Northern Tangkic).[11]

[10] $_{\beta}$] indicates the end of a breath group. In pT, breath groups generally could not end in short /a/. When utterance-final short /a/ was generated by sound change, it appears to have been lengthened. The resulting tension between utterance internal short /a/ and utterance final long /aː/ was later resolved in idiosyncratic ways. This accounts for several, irregular cases of changes of word-final */aX/ > */aː/ in pT — one such change turns up synchronically in Kayardild, where the formal plural (fPL) is /palaṯ/, but its word final form, fPL.T, is /palaa/.

[11] To complicate matters further, consider that */i/-initial suffixes, such as pT middle */-i/ would have attached not only to bases ending in */u, a, i/ but also those ending in */ui, ai, ii/. Echoes of the 'pT D' alternations shown in (a) survive in modern Kayardild.

(a)

pT, A: Stem,	Middle	pT, D: Stem	Middle	Kay.: Stem	Middle
...ui-	...uiː	...iː-/uj-	...uiː	...uː	...iiː
...ai-	...aiː	...a-/aj-/aː-	...aiː	...aː	...aiː
...ii-	...iiː	...iː-	...iiː	...iː	...iː

(4.42) Changes to the locative

Plain stem	Locative pT, A	pT, D	Kayardild	Lardil
...u-	...ui	...iː / uj	...u / uj	...uː
...a-	...ai	...a / aj / aː	...a / aj	...aː
...i-	...ii	...iː	...i / ij	...iː

In modern Kayardild, five individual patterns have descended from the original proto Tangkic situation, each containing the synchronic outcome from a different course of diachronic levelling. In some cases, the loss of backness in the change */ui/ > /ii/ is retained, in others the backness of the original, surface /u/ (which is still the synchronic, underlying vowel) is reinstated. In some cases the length of old */ii, ui/ > /iː/ is retained and generalised, and in others the shortness of old */ai, ui/ > /a(j), u(j)/ is retained and generalised. The five patterns are shown in (4.43). A full set of examples illustrating each filled cell in (4.43) is provided in Appendix A, §A.4.

(4.43) The five classes of hiatus resolving modifications

Final in m_1*	Initial in m_2* I: i/_V	I: i/_C	II: i	II: iː	III: i	IV: i	IV: iː	V: i
C	Ci	Ci	Ci	Ciː	Ci	Ci	Ciː	Ci
u	uj	u	ui	uiː		i	iː	iː
uː			uiː		iiː			
a	aj	a	ai	aiː	aː	a		ai
aː			aiː		aiː			
i	ij	i	iː	iː	iː	i	iː	iː
iː			iː		iː			

*Taking into account consonant deletions associated with the deleting and the regular phonology

As was true of the three classes of consonant cluster modifications, the question of which hiatus resolution class applies in a given case will depend on a range of factors. As m_2 in an m_1+m_2 combination, some suffix morphs always select for the same class to apply across the morph boundary, while others vary.

In Ch.3 §3.12.2, the case was discussed of /CVŋ/ and /CVt̪/ roots. As m_1 in an m_1+m_2 combination, these short, nominal roots underwent modifications from the 'leniting' phonology in the same circumstances where all other morphs ending in /ŋ/ and /t̪/ would undergo the 'regular' phonology. As pointed out in §3.12.2, the contrast was between short *roots* versus other morph types (so that a /CVŋ/ *suffix* would pattern with long /ŋ/-final roots and not with short, /CVŋ/ roots). In a comparable manner, the question of which hiatus resolution class applies across a given m_1+m_2 boundary can be sensitive to the contrast between a short, /CV/ m_1 root versus any other m_1 morph. Table (4.44) lists all suffixal[12] m_2 morphs which trigger hiatus resolving modifications at an m_1+m_2 boundary, together with the relevant role of /CV/ m_1 roots.

[12] Hiatus resolution never applies at the left edge of roots. For the most part this because roots usually surface with an initial consonant, thus preventing vowels from coming into contact across their left boundary. Notionally, a reduplication of a root beginning in /ki/ could trigger hiatus resolution, if it triggered modifications from the 'deleting' phonology and thereby lost its initial /k/. Evans (1995a:60) cites a word *kirrmiliyirrmili* 'pig's foot vine', which would be of this type, but its status as a true Kayardild word is unclear. The word appears elsewhere as *kirmuyirmurra* in Evans' dictionary (1992:78; 1995a:708), and I have recorded it only as *kirmurrirmurra* /kiɻmuriɻmur/, from two speakers. Of the three forms, the first and third conform to the usual pattern of reduplication; the second would be irregular (cf Ch.3 §3.3.3).

(4.44) Hiatus resolution class applying to m_1+m_2 boundary

Morph m_2				Modification class, given m_1 as:							
a.	b.	c.	d.	CV root			any other morph				
formal long locative	fLLOC	/kiː/	D					II			
formal locative	fLOC	/ki/	D	I			I	II			V
formal dual	fDU	/kiarŋ/	D	I			I				
formal from	fFRM	/in/	L/D		II					IV	
formal middle	fMID	/i/	—		II				III	IV	V
formal *iny*	fINY	/iɲ/	—							IV	
formal oblique	fOBL	/in̪t̪a/	L			III	I				
formal same	fSAME	/ic/	L			III	I				
			R							IV	
formal end	fEND	/iɲin/	R							IV	
formal continuous	fCONT	/iːc/	R							IV	

Table (4.44) contains a column, d., which indicates which class of consonant cluster modifications (if any) each suffix triggers. In the case of fMID and fINY, no consonant ever appears at the m_1+m_2 boundary (because fMID and fINY only attach to vowel-final bases); in the case of fFRM, the limited empirical evidence is compatible with an analysis in terms of either the deleting or the leniting phonology. Let us consider the correspondences between the classes of consonant cluster modifications and classes of hiatus resolving modifications, in the sense that one class 'corresponds to' another if both are triggered by the same suffix. Some clear patterns emerge. Firstly, the 'regular' phonology always corresponds to hiatus resolution class IV. Second, in unambiguous cases the 'leniting' phonology always corresponds to class III (with m_1 a CV root) or class I (otherwise). The 'deleting' phonology corresponds at least to classes I, II and V, and if we assume that fFRM triggers it, then also to class IV. A coherent analysis can be formulated as follows. All combinations of morphs m_1+m_2 trigger modifications from one of the consonant cluster modification classes, and one of the hiatus resolution classes. A suffix which triggers the ‘regular’ phonology triggers hiatus resolution class IV; a suffix which triggers the ‘leniting’ phonology triggers class III or I; and a suffix which triggers the ‘deleting’ phonology can trigger any hiatus resolution class. This analysis, summarised in (4.45), will form the basis of discussion in §4.4.3, which considers how hiatus resolving phonology might be integrated into the phonological architectures introduced in §4.3.

(4.45) Correspondences between classes of cluster modification and hiatus resolution

		Hiatus resolution class				
	Cluster modifications	I	II	III	IV	V
a.	Deleting	+	+	+	+	+
b.	Leniting	+		+		
c.	Regular				+	

4.4.2 The location of modifications

As with modifications to consonant clusters, modification to hiatus occurs at morph boundaries, and not elsewhere. In (4.46a,b) for example, hiatus resolution (class I) applies to /ui/ and /ai/ sequences across morph boundaries, but not morph-internally; in (4.46c) hiatus resolution applies at the end of the root but not within it. The hiatus class triggered by the relevant morphs is shown in (4.46) via a subscript to the left of the morph.

(4.46)	a.	*wuyirr-nurru-ntha*	b.	*bayi-marra-y-a*	c.	*wayikuku-y-a*
		wu̲i̲rnurun̪t̪a		pa̲i̲maraja		wa̲i̲kukuja
		*wu̲rnurun̪t̪a		*pa̲maraja		*wa̲kukuja
		wuir-ɳuru-$_{\text{I}}$in̪t̪a-ø		pai-mara-$_{\text{I}}$ki-a		waikuku-$_{\text{I}}$ki-a
		tree sp.-fASSOC-fOBL-T		angry-fASSOC-fLOC-T		rip-fLOC-T
		‘tree sp.-ASSOC-COMP-Ø’		‘angry-ASSOC-INS-Ø’		‘rip-INS-Ø’

There is no evidence in Kayardild of level ordering or of an Affix Ordering Generalisation with respect to hiatus resolution classes. In (4.47) for example, resolution class I applies both earlier and later in the word than class III.

(4.47) *dangka-yarr-janii--c-arra-y-a*
ʈaŋkajarcani:caraja
ʈaŋka-$_{\mathrm{I}}$kiarŋ-cani-$_{\mathrm{III}}$i-c-ŋara-$_{\mathrm{I}}$ki-a
man-fDU-‹fHALL-fMID›-TH-fCONS-fLOC-T
'man-DU-‹PURP›-Ø-PST-EMP-Ø'

4.4.3 Hiatus resolution and phonological architectures

The focus now turns to the question of how the facts of hiatus resolution in Kayardild can be integrated into the kinds of the phonological architectures introduced in §4.3.

4.4.3.1 Regarding apparent ordering between cluster modification and hiatus resolution

If consonant cluster modifications and hiatus resolution are expressed in terms of serial operations, then the former will need to precede the latter, as shown in (4.48) and (4.49).

(4.48) a. Felicitous ordering

	/ɻilu-ic-/	‘east.fALL-fSAME-‘
1. velar deletion (R-stratum)	ɻiluic	
2. hiatus resolution (class IV)	ɻilic	

b. Infelicitous ordering[13]

	/ɻiluŋ-ic-/	‘east.fALL-fSAME-‘
1. hiatus resolution (class IV)	—	
2. velar deletion (R-stratum)	*ɻiluic	

(4.49) a. Felicitous ordering

	/maku-kiarŋ-/	‘woman-fDU-‘
1. initial deletion (D-stratum)	makuiarŋ	
2. hiatus resolution (class I)	makujarŋ	

b. Infelicitous ordering[13]

	/maku-kiarŋ-/	‘woman-fDU-‘
1. hiatus resolution (class I)	—	
2. initial deletion (D-stratum)	*makuiarŋ	

Although cluster simplification and hiatus resolution can be modelled serially, it is not necessary that they be. In a constraint based grammar, both cluster modifications and hiatus resolution can be derived within single pass through one stratum of constraints: if constraints demand the avoidance of (i) certain consonant clusters and (ii) certain vocalic strings, then the most harmonic output candidate will be one which meets both sets of demands, if necessary by manifesting both cluster simplification and hiatus resolution.

[13] An unordered application of rules 1 and 2, where both apply simultaneously to the input, also incorrectly result in */ɻiluic/ and */makuiarŋ/.

4.4.3.2 Hiatus resolution in architectures with indexed constraints

In architectural terms, the incorporation of hiatus resolution into the monostratal and bistratal models is relatively straightforward. The number of required constraints increases, but the basic workings of the strata remain the same. The stratal diacritic which previously distinguished 'D', 'L' and 'R' morphs will need to be enhanced[14] so that it also conveys which hiatus resolution class is to apply. Individual indexed constraints would then make reference to the full range of information represented by the diacritic.

4.4.3.3 Hiatus resolution in multistratal models without indexed constraints

The same, enhanced stratal diacritic would be used in the incorporation of hiatus resolution into any of the multistratal architectures from §4.3. In the multistratal models above, different classes of modifications were separated into different strata. Once hiatus resolution is taken into account, the number of strata multiplies, from three (plus two additional 'early' strata in the case of the architecture in §4.3.6) to eight (plus two 'early' strata) — one for each attested combination of consonant cluster modifications and hiatus resolution.

Eight is a large number of strata. Booij (2000) summarises studies of nine languages within LP, all of which propose either two, three or four strata. An appropriate assessment would seem to be as follows.

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[14] One could increase the number of values taken by the feature (so that each '+' cell in table (4.45) above corresponds to one value), or a second feature devoted just to hiatus resolution could be added. Arguments in favour of one or the other approach would likely emerge once possible constraint rankings were considered.

Firstly, if our expectation is that the morphological operations of a language should divide into something on the order of two to four strata, in terms of the phonological modifications with which they are associated, then empirical details at the level of Kayardild hiatus resolution — which pertains to around a dozen morphs and allomorphs, and involves five phonologically distinct patterns — must be below the level of granularity at which the notion 'stratum' should apply. This raises the question, by what means low-level generalisations should be expressed, such as exist in the Kayardild patterns of hiatus resolution. One option could be to capture hiatus resolution in terms of indexed constraints, which could be incorporated into the larger-scale strata motivated by the phonology of consonant clusters. As such, they would play much the same role as 'minor rule diacritics' of earlier, rule based approaches.

Alternatively, if the coherent grouping of morphological operations, in terms of the phonological modifications with which they are associated, is always to be captured in terms of strata, then the Kayardild patterns of hiatus resolution appear to demand that large numbers of strata be permitted. Consequently any arguments formulated in favour of a stratal approach in preference to others, should not depend upon, or seek justification from, an expectation that the number of strata required will be low.[15]

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[15] This may impact materially on arguments from learnability for example.

4.5 Phonological selection of allomorphs

This section provides a formalisation of the 'surface directed', phonologically conditioned allomorphy discussed in Ch.3, §3.14.[16] This is the kind of allomorphy in which the selection of an underlying allomorph appears to be based on properties of the *surface* form which results from using it, rather than any other allomorph, in the underlying form.

Within generative phonology, it has been recognised for several decades that phonologically conditioned allomorphy can be sensitive not only to underlying phonological structure (as was the case for the 'non-surface directed allomorphy' of Ch.3, §3.14) but to derived structure as well (Anderson 1975; Carstairs 1987; 1988). In a constraint based phonology, outputs of the grammar are always selected to the extent that they optimally satisfy competing, ranked preferences related to surface structures and to similarity between inputs and outputs. In the case of 'surface directed' allomorphy, if we suppose that the allomorphs {α, β, γ} of a morph *m* which attaches to a base *b*, are *all* considered as inputs in a constraint based grammar — i.e., the grammar considers as inputs /b+α/, /b+β/ and /b+γ/ — then the choice of which allomorph is the actual input can often be correctly made merely by choosing which output (of those corresponding to any of the inputs) most optimally satisfies all competing pressures (Kager 2009; see also early implementations of the approach in Drachman et al. 1996; Kager 1996; Mascaró 1996a; 1996b; Tranel 1996). Because some of those pressures refer to surface structures,

[16] For allomorphy conditioned by morphological factors, and for 'non-surface directed' phonologically conditioned allomorphy (conditioned by underlying phonological structure), see Ch.7, §§7.2.4;7.3.5.

allomorph selection will automatically be sensitive to derived structure. This general, formal approach to surface directed allomorphy has been extended to several originally problematic cases by Bonnett et al. (2007), who enhance the model by supposing that one allomorph in a set may be lexically represented as preferred (e.g. as $\{\alpha > \beta, \gamma\}$); subsequently, a constraint which forces the selection of the preferred allomorph is ranked among other all constraints. In those cases where no higher-ranked principle outweighs it, and only in those cases, the 'preferred' allomorph will be selected by default.

Cases of surface directed, phonologically conditioned allomorph selection in Kayardild are analysed along these lines in §4.5.1, and the implications of those analyses for the architectures proposed in §§4.3–4.4 are discussed in §4.5.2.

4.5.1 Allomorphy and sequences of identical short vowels

As introduced in Ch.3, there are several instances of surface directed, phonologically conditioned allomorphy in Kayardild in which the conditions driving the allomorphy are the avoidance, on the surface, of sequences of two identical short vowels, $V_\alpha V_\alpha$, followed either by a third vowel (V) or by a semivowel (S). These are summarised in (4.50). In (4.50c), T_V refers to the allomorphs of the termination T which appear after vowel final bases.[17]

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[17] Regarding the manner in which the patterns in (4.50) in turn fit into the overall allomorphy exhibited by fPROP, fABL, fCONS and T, see Ch.7, §§7.2.4;7.3.5.

(4.50) Phonologically conditioned allomorphy involving surface $V_\alpha V_\alpha$ sequences

	Morphome	Allomorphy	Conditioning	cf.
a.	fPROP	/kuu/ ~ /kuɻu/	/kuu/ appears unless in doing so it would result in a surface $V_\alpha V_\alpha V$ or $V_\alpha V_\alpha S$ sequence.	§3.13.9.1, 3.13.9.4
b.	fABL	/naa/ ~ /napa/	/naa/ appears unless in doing so it would result in a surface $V_\alpha V_\alpha V$ or $V_\alpha V_\alpha S$ sequence.	§3.13.9.2, 3.13.9.4
c.	Tv	/a/ ~ (no realisation)	/a/ appears, unless in doing so it would result in a surface $V_\alpha V_\alpha V$ sequence or a sequence /aa/ preceded by a string containing more than one mora.	§3.7.4

The general approach to be taken to these phenomena is as follows.

The phonological representation passed to a constraint based grammar may sometimes contain one or more morphs which are represented as lists of allomorphs. In the evaluation of output candidates, each candidate will be paired with a corresponding input, which will be identical to the representation passed to the grammar except that in place of each list of allomorphs, any one allomorph from within the list appears. For example, suppose the representation /*a*-{*b*,*c*}-*d*/ is passed to the grammar, where *b* and *c* are allomorphs. Any output candidate may then correspond to an input /*a-b-d*/ or /*a-c-d*/ (but not to both, and not to */*a-b-c-d*/). This input will be the input against which the candidate's faithfulness is evaluated. All input–output pairs are evaluated as any regular input–output pair would be, and a winning output candidate is selected. Because that output corresponds to just one input, and because that input contains just one allomorph from each of the lists which were passed to the grammar, this process also effectively selects an input, including the underlying allomorphs which it contains.

In the process just described, markedness constraints (those which militate against dispreferred surface configurations) will often play a crucial role, as shown in the abstract example in (4.51). Output candidates' corresponding inputs are shown to the left in the first column; the outputs themselves are to the right.

(4.51)

	/*a*-{*b*,*c*}-*d*/	**cd*	MAX	IDENT	**b*
☞	/*a-b-d*/ :: *a-b-d*				1
a.	/*a-c-d*/ :: *a-c-d*	W1			L
b.	/*a-b-d*/ :: *a--d*		W1		L
c.	/*a-c-d*/ :: *a--d*		W1		L
d.	/*a-b-d*/ :: *a-x-d*			W1	L
e.	/*a-c-d*/ :: *a-c-y*			W1	L
f.	/*a-c-d*/ :: *a-b-d*			W1	1

In (4.51), the winning candidate performs better than loser (4.51a) because it does not contain the dispreferred surface string **cd*. Losers (4.51b,c) also avoid **cd* but only by violating the faithfulness constraint MAX, which penalises deletions, and thus they do not perform better than the winning candidate. Losers (4.51d,e) avoid **cd* but do so by changing a segment in some way, thus violating the faithfulness constraint IDENT. Loser (4.51f) actually has the same output as the winner candidate, but because it selects a different input, it too violates IDENT. So in (4.51), the allomorph *b* is selected by the constraint system to be part of the input. In (4.52), the allomorph *c* is selected to be part of the input:

(4.52)	/*e-{b,c}-f*/			**cd*	MAX	IDENT	**b*
	☞	/*e-c-f*/ ::	*e-c-f*				
	a.	/*e-b-f*/ ::	*e-b-f*				W_1
	b.	/*e-b-f*/ ::	*e-c-f*			W_1	
	c.	/*e-b-f*/ ::	*e--f*		W_1		

An interesting characteristic of this kind of analysis is that it is possible for decidedly low-ranked markedness constraints to play a crucial role. Note that in (4.52), the constraint **b* ranks below the faithfulness constraints MAX and IDENT. Typically, this will mean that inputs will not undergo modifications in order to satisfy **b*, because candidate outputs which underwent them would violate the higher-ranking faithfulness constraints MAX or IDENT. Consequently, **b* will play little if any role in the phonology — except in cases when it selects allomorphs. This is not to say that crucial markedness constraints *must* be low-ranked. In (4.51) the top-ranked constraint **cd* was crucial. In Kayardild, there is an unviolated constraint against surface strings in which two short vowels are followed by another vowel, which we can call $*V_\alpha V_\alpha V$. This will play a crucial role in Kayardild allomorph selection. However, there is another constraint $*V_\alpha V_\alpha S$, which penalises candidates containing two short vowels followed by a semivowel. $*V_\alpha V_\alpha S$ normally plays no role in Kayardild phonology — but like **b* above, it does emerge as crucial in cases of allomorph selection. Another low-ranked constraint which will be important can be dubbed *μμaa. This penalises output candidates containing a string /aa/ which is preceded by any string of two or more morae. Arguments for the ranking of *μμaa are subtle as we will see below. These three constraints are summarised in (4.53)–(4.55).

(4.53) $*V_\alpha V_\alpha V$
Outputs do not contain two identical short vowels followed by another vowel.

(4.54) $*V_\alpha V_\alpha S$
Outputs do not contain two identical short vowels followed by a semivowel.

(4.55) *μμaa
Outputs do not contain /aa/ preceded by a string of two or more morae.

Before proceeding to the analysis of Kayardild, one more formalism will be introduced. Following Bonnett et al. (2007), one allomorph within a set may be specified as the default allomorph, written e.g. {*a*>*b*,*c*} where *a, b* and *c* are allomorphs of morphome *M*, with *a* the default. A 'priority' constrain, PRIOR-*M*, then penalises any output candidate which does not take the default allomorph *a* of morphome *M* as its input.[18] The effect of carefully ranking PRIOR-M is shown in (4.56) and (4.57) — for brevity, unfaithful losing candidates are not shown.

[18] An alternative to using PRIOR-*M* constraints and allomorph preferences like {*a*>*b*,*c*} is to employ a morphological realisation constraint such as '*M*→*a*' which demands that *M* be realised as *a* (Kager 1996; Yip 1998; MacBride 2004; Xu 2007). Constraints of the latter type are not the same in their effect as PRIOR-*M* though. The latter type directly enforce *surface* realisations, whereas PRIOR-*M* selects *input* forms. A constraint '*M*→*a*' would be violated if the allomorph *a* underwent any phonological modification on the surface, whereas PRIOR-*M* would not, so long as the input were *a*. In Kayardild, allomorphs are selected at the level of inputs, and regularly undergo further modification.

(4.56)

/*d*-{*a*>*b*,*c*}-*e*/		**da*	MAX	IDENT	PRIOR-*M*	**a*	**b*	**c*
☞	/*d*-*c*-*e*/ :: *d*-*c*-*e*				1			1
a.	/*d*-*a*-*e*/ :: *d*-*a*-*e*	W_1			L	W_1		L
b.	/*d*-*b*-*e*/ :: *d*-*b*-*e*				1		W_1	L

(4.57)

/*f*-{*a*>*b*,*c*}-*e*/		**da*	MAX	IDENT	PRIOR-*M*	**a*	**b*	**c*
☞	/*f*-*a*-*e*/ :: *f*-*a*-*e*					1		
a.	/*f*-*b*-*e*/ :: *f*-*b*-*e*				W_1	L	W_1	
b.	/*f*-*c*-*e*/ :: *f*-*c*-*e*				W_1	L		W_1

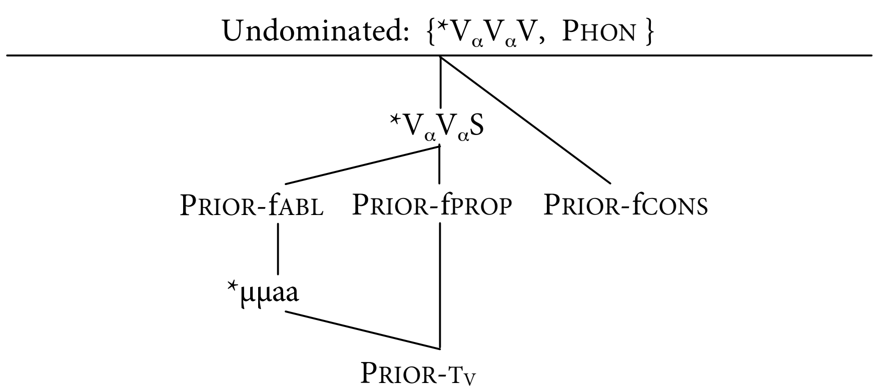
In (4.56) the markedness constraint **da* outranks PRIOR-*M* and has the effect of ruling out the candidate which is based on the default allomorph *a* (low-ranking markedness constraints then cause an output based on allomorph *c* to win). In (4.57), the same constraint ranking does allow PRIOR-*M* to have an effect, causing the candidate based on the default allomorph *a* to win. With these analytic tools in hand, let us now turn to Kayardild. At this point, we will set to one side the implications that the analysis will have for the larger, architectural picture developed in previous sections; we return to that issue in §4.5.2 below.

Phonological allomorph selection in Kayardild will be analysed here in terms of (i) the markedness constraints (4.53)–(4.55) above; (ii) priority constraints PRIOR-fPROP, PRIOR-fABL, PRIOR-TV and the lexical representations of allomorphy {/kuu/ > /kuɻu/} for fPROP, {/naa/ > /napa/} for fABL and {/a/ > Ø} for TV; and (iii) a cover constraint which stands in for the bulk of constraints which drive the phonology, shown in (4.58).

(4.58) PHON (cover constraint)
Input–output pairs adhere without exception to the regular, leniting or deleting phonologies and hiatus resolution classes I-V, as is applicable given their stratal diacritics.

For the most part, constraints which drive allomorph selection are very low-ranked and have no visible effect on the phonology other than to select allomorphs. The ranking is shown in (4.59).[19] Example tableaux follow, illustrating the analysis of the allomorphy that was summarised in table (4.50) above.

(4.59)



The termination T is usually /a/ after vowel final bases but not after /a/-final bases over two morae in length. Tableaux (4.60)–(4.62) illustrate this pattern. Only candidates which satisfy PHON are shown; in these cases, that means that no unfaithful candidates are shown.

[19] Evidence for individual, pairwise rankings can be found in the tableaux below as follows: ||*μμaa » PRIOR-T_V || in (4.62a); || PRIOR-fABL » *μμaa || in (4.63b) and given this, || $*V_\alpha V_\alpha S$ » PRIOR-fABL || in (4.65a); || PRIOR-fPROP » PRIOR-T_V || in (4.66c); || $*V_\alpha V_\alpha S$ » PRIOR-fPROP || in (4.71b).

			$*V_\alpha V_\alpha V$	$*V_\alpha V_\alpha S$	PRIOR-fABL	$*\mu\mu$aa	PRIOR-fPROP	PRIOR-TV
(4.60)		/ʈaŋka-{a>Ø}/ ‘man-T’						
	☞	/ʈaŋka-a/ :: ʈaŋkaa						
	a.	/ʈaŋka-/ :: ʈaŋka						W1
(4.61)		/cuŋara-{a>Ø}/ ‘big-T’						
	☞	/cuŋara-/ :: cuŋara						1
	a.	/cuŋara-a/ :: cuŋaraa				W1		L
(4.62)		/ŋa:ka-{a>Ø}/ ‘who-T’						
	☞	/ŋa:ka-/ :: ŋa:ka						1
	a.	/ŋa:ka-a/ :: ŋa:kaa				W1		L

When the formal ablative (fABL) realises A-TAM:prior it is usually /naa/, and is followed by the zero (i.e., non-overt) allomorph of T. Tableau (4.63) illustrates this. In these cases, PHON would be violated if any of the input allomorphs /naa/, /napa/ or /a/ failed to surface faithfully. As such, the winning candidate will violate $*\mu\mu$aa once, in order that it not violate PHON, as loser (4.63a) does, or violate PRIOR-fABL, as loser (4.63b) does.

(4.63)	/ʈan-ki-{naa>napa}-{a>Ø}/ 'here-fLOC-fABL-T'		$*V_\alpha V_\alpha V$	PHON	$*V_\alpha V_\alpha S$	PRIOR-fABL	*ɰaa	PRIOR-fPROP	PRIOR-TV
☞	/ʈan-ki-naa-/	:: ʈankinaa					1		1
a.	/ʈan-ki-naa-/	:: ʈankina		W_1			L		1
b.	/ʈan-ki-napa-/	:: ʈankinapa				W_1	L		1
c.	/ʈan-ki-naa-a/	:: ʈaŋkinaaa	W_1				W_2		L
d.	/ʈan-ki-naa-a/	:: ʈaŋkinaa		W_1			1		L
e.	/ʈan-ki-napa-a/	:: ʈaŋkinapaa				W_1	1		L

When fABL, realising A-TAM:prior, is followed by fOBL it remains /naa/, but it appears as /napa/ when followed by fLOC in order that $*V_\alpha V_\alpha S$ is not violated. This is shown in (4.64) and (4.65).

(4.64)	/ʈan-ki-{naa>napa}-in̪t̪a-{a>Ø}/ 'here-fLOC-fABL-fOBL-T'		$*V_\alpha V_\alpha V$	PHON	$*V_\alpha V_\alpha S$	PRIOR-fABL	*ɰaa	PRIOR-fPROP	PRIOR-TV
☞	/...-naa-in̪t̪a-/	:: ʈankinaan̪t̪a							1
a.	/...-napa-in̪t̪a-/	:: ʈankinapan̪t̪a				W_1			1
b.	/...-naa-in̪t̪a-a/	:: ʈankinaan̪t̪aa					W_1		L
c.	/...-napa-in̪t̪a-a/	:: ʈankinapan̪t̪aa				W_1	W_1		L
(4.65)	/ʈan-ki-{naa>napa}-ki-{a>Ø}/ 'here-fLOC-fABL-fLOC-T'								
☞	/...-napa-ki-a/	:: ʈankinapaja				1			
a.	/...-naa-ki-a/	:: ʈankinaaja			W_1	L	W_1		
b.	/...-napa-ki-/	:: ʈankinapaj				1			W_1
c.	/...-naa-ki-/	:: ʈankinaaj			W_1	L	W_1		W_1

When the formal proprietive (fPROP) realises A-TAM:future or TH-TAM:potential it is usually /kuu/. Following it, the termination T is non-overt, in order that $*V_\alpha V_\alpha V$ not be violated. Importantly, the ranking of ‖ Prior-fprop » Prior-Tv ‖ ensures that the output /...kuu/ is chosen, and not /...kuɻua/, which would also avoid a violation of $*V_{\alpha}V_{\alpha}V$. This is seen in (4.66), where fprop realises th-tam:potential, and (4.67) where fprop realises a-tam:future. After a base which ends in /u/, the /kuu/ allomorph cannot appear, once again because $*V_{\alpha}V_{\alpha}V$ (and Phon) must not be violated. This is illustrated in tableau (4.68).

			$*V_{\alpha}V_{\alpha}V$	Phon	$*V_{\alpha}V_{\alpha}S$	Prior-fabl	*μμaa	Prior-fprop	Prior-Tv
(4.66)		/kala-c-{kuu>kuɻu}-{a>Ø}/ bite-th-fprop-t 'bite-Ø-pot-Ø'							
	☞	/kala-c-kuu-/ :: kalacuu							1
	a.	/kala-c-kuu-a/ :: kalacuua	W$_1$						L
	b.	/kala-c-kuɻu-/ :: kalacuɻu						W$_1$	1
	c.	/kala-c-kuɻu-a/ :: kalacuɻua						W$_1$	L
(4.67)		/ʈaŋka-{kuu>kuɻu}-{a>Ø}/ man-fprop-t 'man-fut-Ø'							
	☞	/ʈaŋka-kuu-/ :: ʈaŋkauu							1
	a.	/ʈaŋka-kuu-a/ :: ʈaŋkauua	W$_1$						L
	b.	/ʈaŋka-kuɻu-/ :: ʈaŋkauɻu						W$_1$	1
	c.	/ʈaŋka-kuɻu-a/ :: ʈaŋkauɻua						W$_1$	L
(4.68)		/maku-{kuu>kuɻu}-{a>Ø}/ woman-fprop-t 'woman-fut-Ø'							
	☞	/maku-kuɻu-a/ :: makuuɻua						1	
	a.	/maku-kuɻu-/ :: makuuɻu						1	W$_1$
	b.	/maku-kuu-a/ :: makuuua	W$_2$					L	
	c.	/maku-kuu-/ :: makuuu	W$_1$					L	W$_1$
	d.	/maku-kuu-/ :: makukuu		W$_1$				L	W$_1$

When followed by fOBL, fPROP remains /kuu/ except after bases ending in /u/, as shown in (4.69) and (4.70); when followed by fLOC, it is realised as /kuɻu/ in all cases in order not to violate $*V_\alpha V_\alpha S$, as illustrated in (4.71).

			$*V_\alpha V_\alpha V$	PHON	$*V_\alpha V_\alpha S$	PRIOR-fABL	$*\mu\mu aa$	PRIOR-fPROP	PRIOR-T_V
(4.69)	/kala-c-{kuu>kuɻu}-in̪t̪a-{a>Ø}/ fly-TH-fPROP-fOBL-T								
☞	/...-kuu-in̪t̪a-/	:: kalacuun̪t̪a							$_1$
a.	/...-kuu-in̪t̪a-a/	:: kalacuun̪t̪aa					W$_1$		L
b.	/...-kuɻu-in̪t̪a-/	:: kalacuɻun̪t̪a						W$_1$	$_1$
c.	/...-kuɻu-in̪t̪a-a/	:: kalacuɻun̪t̪aa					W$_1$	W$_1$	L
(4.70)	/maku-{kuu>kuɻu}-in̪t̪a-{a>Ø}/ woman-fPROP-fOBL-T								
☞	/...-kuɻu-in̪t̪a-/	:: makuuɻun̪t̪a						$_1$	$_1$
a.	/...-kuɻu-in̪t̪a-a/	:: makuuɻun̪t̪aa					W$_1$	$_1$	L
b.	/...-kuu-in̪t̪a-/	:: makuuun̪t̪a	W$_1$					L	$_1$
c.	/...-kuu-in̪t̪a-a/	:: makuuun̪t̪aa	W$_1$				W$_1$	L	L
(4.71)	/kala-c-{kuu>kuɻu}-ki-{a>Ø}/ fly-TH-fPROP-fLOC-T								
☞	/...-kuɻu-ki-a/	:: kalacuɻuja						$_1$	
a.	/...-kuɻu-ki-/	:: kalacuɻuj						$_1$	W$_1$
b.	/...-kuu-ki-a/	:: kalacuuja			W$_1$			L	
c.	/...-kuu-ki-/	:: kalacuuj			W$_1$			L	W$_1$

In Ch.3, §3.13.9.4 it was mentioned that fCONS, which has two allomorphs {ŋara>ŋarpa}, can also be analysed as undergoing phonological allomorph selection when it realises TH-TAM:past, only that because choosing the default /ŋara/ never gives rise to a violation of $*V_\alpha V_\alpha V$ or $*V_\alpha V_\alpha S$, there is no reason to resort to using /ŋarpa/ and hence there is no visible, phonologically-driven alternation. This is illustrated in (4.72)–(4.74).

(4.72)	/kala-c-{ŋara>ŋarpa}-{a>Ø}/ fly-TH-fCONS-T		*$V_\alpha V_\alpha V$	PHON	*$V_\alpha V_\alpha S$	*μμaa	PRIOR-T_V	PRIOR-fCNOS
☞	/...-ŋara-/	:: kalacara					1	
a.	/...-ŋara-a/	:: kalacaraa				W_1	L	
b.	/...-ŋarpa-/	:: kalacarpa					1	W_1
c.	/...-ŋarpa-a/	:: kalacarpaa				W_1	L	W_1

(4.73)	/kala-c-{ŋara>ŋarpa}-in̪t̪a-{a>Ø}/ fly-TH-fCONS-fOBL-T		*$V_\alpha V_\alpha V$	PHON	*$V_\alpha V_\alpha S$	*μμaa	PRIOR-T_V	PRIOR-fCNOS
☞	/...-ŋara-in̪t̪a-/	:: kalacaran̪t̪a					1	
a.	/...-ŋara-in̪t̪a-a/	:: kalacaran̪t̪aa				W_1	L	
b.	/...-ŋarpa-in̪t̪a-/	:: kalacarpan̪t̪a					1	W_1
c.	/...-ŋarpa-in̪t̪a-a/	:: kalacarpan̪t̪aa				W_1	L	W_1

(4.74)	/kala-c-{ŋara>ŋarpa}-ki-{a>Ø}/ fly-TH-fCONS-fLOC-T		*$V_\alpha V_\alpha V$	PHON	*$V_\alpha V_\alpha S$	*μμaa	PRIOR-T_V	PRIOR-fCNOS
☞	/...-ŋara-ki-a/	:: kalacaraja						
a.	/...-ŋara-ki-/	:: kalacaraj					W_1	
b.	/...-ŋarpa-ki-a/	:: kalacarpaja						W_1
c.	/...-ŋarpa-ki-/	:: kalacarpaj					W_1	W_1

Finally, a short comment regarding free variation and fPROP. The formal proprietive, fPROP, exhibits apparently free variation under certain conditions. Essentially, where the descriptions above referred to the /kuu/ allomorph being chosen, there is in fact variation between /kuu/ and /kuɻu/. The precise nature of the variation is not understood, but supposing that it is true, free variation, it may be analysed as follows. Working within versions of OT which enable constraints to be variably reranked, researchers such as Nagy & Williams (1995), Anttila (1997) have accounted free variation in terms of variability in constraint rankings, e.g. || X » Y || ~ || Y » X ||. This approach could be applied to

Kayardild: if we rerank PRIOR-fPROP, so that it is below and PRIOR-T_V, we obtain /kuɻu/ allomorphs corresponding to all of the /kuu/ allomorphs above (while keeping the /kuɻu/ allomorphs from above as they are). Examples are shown in (4.75), (4.76) and (4.77), which correspond respectively to examples (4.66), (4.67) and (4.68) above, but with PRIOR-fPROP reranked.

			*$V_\alpha V_\alpha V$	PHON	*$V_\alpha V_\alpha S$	PRIOR-fABL	*μμaa	PRIOR-T_V	PRIOR-fPROP
(4.75)		/kala-c-{kuu>kuɻu}-{a>Ø}/ bite-TH-fPROP-T 'bite-Ø-POT-Ø'							
	☞	/kala-c-kuɻu-a/ :: kalacuɻua							1
	a.	/kala-c-kuu-a/ :: kalacuua	W_1						L
	b.	/kala-c-kuɻu-/ :: kalacuɻu						W_1	1
	c.	/kala-c-kuu-/ :: kalacuu						W_1	L
(4.76)		/ʈaŋka-{kuu>kuɻu}-{a>Ø}/ man-fPROP-T 'man-FUT-Ø'							
	☞	/ʈaŋka-kuɻu-a/ :: ʈaŋkauɻua							1
	a.	/ʈaŋka-kuu-a/ :: ʈaŋkauua	W_1						L
	b.	/ʈaŋka-kuɻu-/ :: ʈaŋkauɻu						W_1	1
	c.	/ʈaŋka-kuu-/ :: ʈaŋkauu						W_1	L
(4.77)		/maku-{kuu>kuɻu}-{a>Ø}/ woman-fPROP-T 'woman-FUT-Ø'							
	☞	/maku-kuɻu-a/ :: makuuɻua							1
	a.	/maku-kuɻu-/ :: makuuɻu						W_1	1
	b.	/maku-kuu-a/ :: makuuua	W_2						L
	c.	/maku-kuu-/ :: makuuu	W_1					W_1	L
	d.	/maku-kuu-/ :: makukuu		W_1				W_1	L

4.5.2 Phonologically conditioned allomorphy and the phonological architecture

If the analyses introduced above are on track, then phonologically conditioned allomorphy has non-trivial implications for the viability of several of the phonological architectures introduced and discussed in §§4.3–4.4. Centrally, if the representation which is passed to the phonology contains lists of allomorphs, then (i) the correct allomorph needs to be selected within the *first* stratum of constraints through which it passes, since no stratum will ever output a list of allomorphs whose selection could then be deferred until a later stratum; and (ii) in that first stratum the full phonological context will need to be available, which is responsible for selecting the right allomorph. Let us now review the architectures introduced in §§4.3–4.4 in light of these requirements.

The monostratal architecture of §4.3.3 is compatible with the analysis of allomorphy in §4.5.1, since it processes all modifications within a single stratum.

A harmonically serial architecture (§4.3.5) in general will fail, because it builds up the environment which conditions allomorph selection only gradually, over several repeated passes through the same constraint based grammar, thus the full environment will not be present at the point when allomorph selection takes place.

The cyclic model of §4.3.1 will also fail, though not due to any gradualness in the production of phonological modifications. Rather, the failure results from the fact that the allomorphy of fPROP and fABL morphomes is sensitive to phonological material to the *right* (as well as to the left). Consequently, the morph which follows any token of fPROP or fABL needs already to be adjacent to that token when it passes through its first stratum. This is not the case in the cyclic model though, because words are assembled one morph at a time. The general failure of cyclic models of phonology and morphology in the face of allomorphy which is sensitive to phonological material in suffixes to the right was first identified by Carstairs (1987; 1988). So long as we maintain that fPROP and fABL are sensitive to the phonological material to their right,[20] the Kayardild data will remain incompatible with a cyclic model.

With appropriate assumptions built in, the 'fell swoop' multistratal architecture of §4.3.2 can be compatible with the analysis of allomorph selection in §4.5.1. Let us first consider the allomorphy of fPROP. Although this model does not always pass fPROP through a stratum together with the following morph, it does always pass the combination fPROP+fLOC through the D-stratum together, since fPROP and fLOC both carry a 'D' diacritic.[21] This means that whenever the allomorph of fPROP is chosen the crucial conditioning environment will be present, in which a following /j/ in the output (from fLOC) forces the selection of the non-default fPROP allomorph /kuɻu/. Now, fOBL and fSAME can also appear after fPROP and they both carry an 'L' diacritic and so therefore will not be adjacent to fPROP when it passes through the D-stratum and has its allomorphy decided. By a stroke of luck this is not problematic though. In the D-stratum, the fPROP allomorph /kuu/ will be selected by default, and this is in fact the allomorph which should

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[20] If the rightward sensitivity of fPROP and fABL is reanalysed as being morphological rather than phonological then the problem does not arise, since in that case the phonology will no longer be charged with the task of choosing between allomorphs — the correct allomorph will be handed to it from the morphology.

[21] This can be maintained even once the facts of hiatus resolution are taken into account, as follows. Because fPROP does not ever trigger hiatus resolving modifications to its left, and so therefore is not incompatible with any of the five hiatus resolution classes, it can be assigned to any of the individual D-strata. The fLOC which realises COMP:empathy and which conditions allomorphy in fPROP is assigned to the D/Class-I stratum. So long as fPROP is also assigned to the D/Class-I stratum by its stratal diacritic, all relevant fPROP-fLOC strings will pass through that stratum together and the derivation will succeed.

precede fOBL or fSAME.[22] Even if it is only by accident that the correct derivation obtains, it does obtain. Now consider fABL. The same situation will apply to fABL provided we assume that the fABL allomorphs /naa/ and /napa/ carry the same stratal diacritic as fPROP and fLOC. There is no independent evidence that this is so, but neither is there strong evidence against it. For example, are no other /n/-initial morphs which carry a 'D' diacritic and whose phonological behaviour is different from fABL.[23] As such, if it is stipulated that fABL carries the same stratal diacritic as fPROP, then the 'fell swoop' multistratal architecture of §4.3.2 is compatible with the analysis of allomorph selection in §4.5.1. For the same reasons, and with the same stipulations, the architecture discussed in §4.3.6 can also be made compatible. The architecture in §4.3.6 incorporated L- and R- strata which were both split into an 'early' stratum and 'main' stratum. The D-stratum — or D-strata once hiatus resolution is taken into account — were not split though, and thus for the purposes of fPROP and fABL allomorph selection (which occurs in the D/Class-I stratum), the architecture in §4.3.6 is equivalent to that in §4.3.2.

The bi-stratal architecture of §4.3.4 is not compatible with the analysis of phonologically sensitive allomorphy in §4.5.1, for essentially the same reasons that a harmonically serial architecture is not: phonological modification takes place too

[22] Unless fPROP attaches to a base ending in /u/, however that base will be attached to fPROP in the D-stratum, and so will successfully have its correct influence on allomorph selection.

[23] Other considerations are ambivalent: other morphs tend to lose their initial consonants in the D-stratum, yet fABL does not; on the other hand, no other 'D' morphs begin with an apical consonant, and overall, apicals are the most resistant to deletion in Kayardild.

gradually. In the bi-stratal architecture an ‘early’ stratum modifies morph final /ɲ/ and deletes morph final velars, before a ‘main’ stratum effects all other changes. Because the entire word passes through the early stratum, allomorph selection needs to take place there, yet the early stratum does not effect enough modifications to provide the full conditioning environment for allomorph selection. Crucially, it will not change fLOC /ki/ to /j/ or fOBL /in̪t̪a/ to /n̪t̪a/ or fPROP /kuu/ to /uu/, and thus the environments which ought to condition allomorph selection will be absent. This is illustrated in (4.78) and (4.79), where the cover constraint E-PHON enforces just the modifications of the ‘early’ stratum. The incorrect, winning candidates are marked with ‘👎’ and the losers which should actually win with ‘☞’.

(4.78)	(‘Early’ stratum in the bi-stratal model) /kala-c-{kuu>kuɻu}-in̪t̪a-{a>Ø}/ fly-TH-fPROP-fOBL-T		$*V_\alpha V_\alpha V$	E-PHON	$*V_\alpha V_\alpha S$	*µµaa	PRIOR-fPROP	PRIOR-TV
👎	/...-kuɻu-in̪t̪a-/	:: kalackuɻuin̪t̪a					1	1
a.	/...-kuu-in̪t̪a-a/	:: kalackuuin̪t̪aa	W_1			W_1	L	L
b.	/...-kuɻu-in̪t̪a-a/	:: kalackuɻuin̪t̪aa				W_1	1	L
☞ c.	/...-kuu-in̪t̪a-/	:: kalackuuin̪t̪a	W_1				L	1
(4.79)	/kala-c-{kuu>kuɻu}-ki-{a>Ø}/ fly-TH-fPROP-fLOC-T							
👎	/...-kuu-ki-a/	:: kalackuukia						
a.	/...-kuɻu-ki-/	:: kalackuɻuki					W_1	W_1
b.	/...-kuu-ki-/	:: kalackuuki						W_1
☞ c.	/...-kuɻu-ki-a/	:: kalackuɻukia					W_1	

In (4.78) the incorrect, winning candidate would progress to the ‘main’ stratum and yield the unwanted output *kalajuruntha* /kalacuɻun̪t̪a/, whereas loser (4.78c), if it progressed would yield the correct output *kalajuuntha* /kalacuun̪t̪a/. Likewise, in (4.79) the incorrect winning candidate would progress and yield **kalajuuya* /kalacuuja/ instead of (4.79c) which would yield the correct output *kalajuruya* /kalacuɻuja/.

The essence of the problem here is that the bi-stratal model effectively forces allomorph selection to be sensitive to the phonological form of an intermediate representation which differs considerably from the eventual surface form, whereas the empirical facts point to the allomorph selection currently under consideration being sensitive to surface configurations (cf Ch.3, §3.14). As with the failing of the cyclic model, what is at stake here is a species of empirical data which presents a fundamental challenge to a general family of architectures — the following discussion explores this claim further.

In §4.3.6 we saw that splitting consonant cluster modifications into a serially ordered 'early' and 'main' set enabled the analysis to capture in a coherent, insightful manner the fact that in Kayardild phonology many modifications follow clear, straightforward patterns *given that* morph final /ɲ/ acts like /n/ and morph final velars act as if they were absent. As a formal device, seriality introduces an intermediate representation (in which underlying /ɲ/ is now represented as /n/, and velars are absent) which furnishes the formal object that relates to surface forms in these 'clear, straightforward' ways. Essentially, the serial architecture allows for pairwise relationships to be established between three representations: Underlying ↔ Intermediate ↔ Surface. However, if we wish pursue the notion that *surface* phonology conditions the choice of *underlying* allomorphs[24] then we need to establish direct relationships of the kind Underlying ↔ Surface.[25] The formal devices currently employed in constraint based phonological theory do not offer such an option.

Equipped with this understanding of the formal issues involved, we can now be confident that the ability of two of the multistratal architectures discussed above, to derive correct forms in Kayardild using phonological allomorph selection, is a fortuitous accident. The correct forms are obtained only because, with a judicious amount of stipulation, the conditioning environment which selects the non-default allomorphs of fPROP and fABL happens to be established in the D-stratum, within which a split into 'early' and 'late' levels happens not to be motivated. Were the empirical facts slightly different, or were it not justifiable to assign to fABL /naa/ and /napa/ the same stratal

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[24] I suspect that this kind of analysis does capture a real truth about the nature of the phonology and morphology in natural languages. Moreover, it is not the only kind of phenomenon which appears to demand that formal relationships be established between non-adjacent levels of representation. One can also cite the existence of lexical restrictions on post-lexical processes (Mohanan 1995), and post-lexical processes which make reference to word-internal structure (Odden 1995).

[25] In some versions of harmonic serialism, the faithfulness of a given intermediate representation is measured relative not to the immediately prior intermediate representation, but to an earlier representation, namely the first fully faithful output derived from the input (McCarthy 2007). For phonologically conditioned allomorph selection to succeed though, we require more than this. Firstly, a connection needs to be made with the *underlying* form, not merely with an early intermediate form; secondly, the connection needs to be made in terms not only of faithfulness but of markedness too.

diacritic as fPROP and fLOC, then the architecture would most likely be unable to derive the correct forms.

To summarise, the analysis of phonologically sensitive allomorph selection in §4.5.1 relies upon the existence of a stratum in which (i) the input contains a list of allomorphs and (ii) the output already contains the relevant phonological conditioning environment. Through good fortune more than good design, two of the multistratal architectures (from §4.3.2 and §4.3.6) meet these criteria and so are compatible with the approach of §4.5.1. In addition, the monostratal architecture of §4.3.3 is compatible with it. It has been discussed that in the general case, the empirical generalisations related to phonologically sensitive allomorph selection appear to require that relationships be establishable directly between the underlying representation and the surface representation. At present, the formal device of positing multiple, serially ordered strata, which is employed in order to derive intermediate representations that are motivated by other aspects of the data, is incompatible with the establishment of those relationships.

4.6 The phonology of vowel–laminal sequences

This section examines the modifications which apply to certain laminal consonants, according to the vocalic context to their left.

4.6.1 The content and location of modifications

In roots, laminal consonants do not alternate (other than in ways already covered in terms of consonant cluster phonology in §4.2). In suffixes, some laminal consonants are always palatal, while others alternate between palatal and dental. The analysis here will be that those which do not alternate are underlyingly palatal, while those which do alternate are underlyingly dental. The distribution of vowel–laminal interactions within the word is unlike what was encountered above in the phonology of consonant clusters and vowel hiatus, in that it is not restricted to derived environments. The palatalisation of underlying dentals may occur even when the vowel–laminal string is entirely contained within a suffixal morph, as occurs in /in̪t̪a/ → /iɲca/ in (4.80a). Meanwhile, the alternation fails to occur in roots, even in derived environments, as in (4.80b), where root initial /t̪/ in the second copy of /t̪aʈa/ 'shoulder' resists becoming /c/ (after a preceding /i/ vowel) even at a morph boundary.

(4.80)	a.	*dan-inja-*	b.	*tharda-wi--tharda-wi-ja*
		ʈaniɲca		t̪aʈawit̪aʈawica
		ʈan-in̪t̪a-ø		t̪aʈa-wi-c-t̪aʈa-wi-ca
		this-fOBL-T		‹shoulder-fLWR-TH-shoulder-fLWR›-TH.T
		'this-COMP-Ø'		'‹swinging one shoulders›-ACT'

For the most part, the conditions under which a suffixal laminal dental consonant becomes palatal are transparent at the surface: palatalisation occurs when the laminal follows either a front vowel or a long vowel. That pattern will be analysed here as holding without exception at the lexical level of representation; as mentioned in Ch.2, §2.2.1.4 and Ch.3 §3.4.1, in order for this to obtain, we require a non-obvious analysis of the phonological representation of vowels in four specific morphs. The allomorphs /kuu/ and /naa/ of fPROP and fABL are taken to contain two short vowels rather than one long vowel; see also Ch.2, §2.2.1.4 for other simplifications in the description of these morphs' phonological behaviour which follow from making that assumption. The verb roots *thaa-* 'return' and *daa-* 'bob$_{NL}$' are assumed to be /t̪aa-/ and /taa-/ with two short vowels rather than one long vowel. As mentioned in Ch.3 §3.4.1, they are the only two verb roots in Kayardild which are followed by a dental thematic /t̪/ after what otherwise appears to be a long vowel.

In some cases, other phonological processes feed the palatalisation of underlying dentals. This is true when the surface vowel preceding a laminal has been altered by hiatus resolution, as can be seen in (4.81).

(4.81)	a.	*jaa-nja-*	b.	*-marii--j-*
		caːɲca		-mariːc-
		ca-in̪t̪a-ø		-maru-i-t̪-
		foot-fOBL-T		-‹fDAT-fMID›-TH-
		'foot-CONT-T'		'‹TRANS›-Ø-'

In one case, the surface ban on sequences of long vowel plus a laminal dental is satisfied in the other direction: faithfulness to the underlying dental articulation is respected while the vowel is shortened, as illustrated in (4.82). An analysis of these patterns in terms of specific constraints will not be attempted here.

(4.82)	a.	*ba-nthu-tha*	b.	*ra-nthu-tha*
		pan̪t̪ut̪a		ɻan̪t̪ut̪a
		paː-n̪t̪u-t̪a		ɻaː-n̪t̪u-t̪a
		bite-fRCP-TH.T		spear-fRCP-TH.T
		'bite-RCP-ACT'		'spear-RCP-ACT'

4.6.2 Discussion

The interaction of morphology with the phonology of vowel–laminal sequences differs from what was seen earlier in two key respects. Firstly, as mentioned, phonological modifications to vowel–laminal sequences do not apply merely in derived environments. Secondly, they are directly sensitive to the distinction between roots and suffixes. Although consonant cluster reduction and hiatus resolution were sensitive to different classes of morphological combinations, neither discriminated directly between roots and suffixes. Taken within the purview of Kayardild's segmental phonology then, modifications to vowel–laminal sequences appear unusual. However, if we extend our view to include prosodic phonology (Ch.5, §5.3) we find that the morphological factors which condition vowel–laminal modifications are much like those which condition stress. Stress is also sensitive to the distinction between roots and suffixes,[26] yet insensitive to the distinctions between morphs carrying different stratal diacritics, and it does not appear to be amenable to a cyclic analysis (§5.3.5.3). Taking a general view, what this entails is that the information passed to the phonology from the morphology will need to include not only an indication of morphs' stratal diacritics, but also an indication of their status as a root or suffix.

[26] In fact, stress is even more sensitive, in that it treats nominal and verbal roots distinctly, and makes reference to the units involved in reduplication.

5 Prosodic structure and intonation

This chapter sets out a comprehensive analysis of stress in Kayardild and a preliminary analysis of intonation. Beginning with stress, an overview of prosodic theory and Kayardild prosodic constituency is given in §5.1, followed by a discussion of issues in the identification of Kayardild stress in §5.2 and a comprehensive, constraint based analysis in §5.3. Turning to intonation, an overview of the empirical facts is presented in §5.4, an introduction to the autosegmental metrical method of intonational analysis in §5.5 and an initial, formal analysis in §5.6.

5.1 Prosodic theory and prosodic constituency in Kayardild

A central advance in the field of phonology over the past several decades has been the successful articulation of a theory of prosody. The formulation of a view of linguistic sound structure in terms of hierarchically related domains, and in terms of the prominence relationships within that hierarchy, has altered the way we regard not only the formal organisation of natural language phonologies, but also the empirical facts that require description and explanation.

Following the seminal works of Liberman (1975[1978]) and Liberman and Prince (1977), prosodic prominence will be treated here as a matter of relationships between stronger and weaker sisters, and between parents and daughters within a hierarchical prosodic constituent structure. In keeping with the subsequent interpretation of these foundational ideas, stronger sisters are considered to be **heads** within some **prosodic domain**, and weaker sisters to be non-heads. In addition, building on research beginning with Prince (1983), the facts of rhythmic organisation within the stress system of Kayardild will be interpreted in terms of well-formedness conditions on the same prosodic constituent structure.

5.1.1 A hierarchy of prosodic domains

In addition to the articulation of a notion of prosodic prominence as a structural property of phonological form — as opposed to a matter of features such as Chomsky & Halle's *n*-ary stress — early work in metrical phonology began exploring the hypothesis that the prosodic domains which appear in such structures are of specific types (Selkirk 1980). Connected to this line of inquiry have been two main proposals: (i) that prosodic constituent types are broadly comparable across languages and perhaps even universal; (ii) that a limit to the number of types and their permissible structural relationships to one another can inform the study of cross-linguistic commonalities in prosodic systems. Several universalist proposals emerged as to the inventory of permissible domains (Selkirk 1984; Nespor & Vogel 1986), and subsequent research has seen a stable set of domains being used in the lexical domain — specifically, the syllable, foot and prosodic word. In the phrasal domain though there continues to be debate at the theoretical level, and variation and disparities between individual, language-specific analyses \{see e.g. \Gussenhoven, 2004 #909@166–67; Gordon, 2005 #1311}.

In this dissertation, the phonology of Kayardild will be analysed in terms of a prosodic hierarchy shown in (5.1).

(5.1) Prosodic hierarchy in Kayardild

υ	Utterance
|	
β	Breath group[1]
|	
ω	Prosodic word
|	
Σ	Foot
|	
σ	Syllable

Prosodic structures up to the prosodic word are built at the lexical level, while breath groups and utterances are built post-lexically and typically span across multiple words.

5.1.2 The Strict Layering Hypothesis

The complement to an inventory of prosodic domains is a theory of how those domains relate to one another within licit hierarchical structures. A central hypothesis within metrical and prosodic theory has been the Strict Layer Hypothesis (Selkirk 1984; Nespor &

[1] For the purposes of cross-linguistic comparison, the breath group β can be considered on par with many other languages' utterance domains, υ. An alternative to the analysis presented in this chapter would be to label β as a subordinate υ constituent, in a system which permits recursive embedding of υ domains.

Vogel 1986). In its most recent form (Inkelas 1989; Selkirk 1995; Itô & Mester 2003), the SLH is viewed in terms of four principles, shown in (5.2).

(5.2) Strict Layer Hypothesis (SLH)
In a hierarchy of prosodic constituents at levels 1,2,...*n* (where level 1 is the lowest level, the level of the syllable):

a. HEADEDNESS
Every prosodic constituent at level *i*, where *i*>1, immediately dominates a constituent at level *i*–1.
e.g. Every foot must dominate a syllable.

b. LAYEREDNESS
No constituent at level *i* dominates a constituent at level *j*, where *j*>*i*.
e.g. No syllable dominates a foot.

c. NONRECURSIVITY
No constituent at level *i* dominates a constituent at level *i*.
e.g. No foot dominates a foot.

d. EXHAUSTIVITY
No constituent at level *i* immediately dominates a constituent at a level below *i*–1.
e.g. No prosodic word immediately dominates a syllable.

Parts (5.2a,b) of the SLH are understood to be universal conditions on prosodic structure. Parts (5.2c,d) on the other hand represent constraints which in the phonologies of some languages may be violated under appropriate conditions.

The violability of part (5.2c) is now widely accepted, especially with respect to the domination of syllables. In contemporary analyses of stress, it is commonplace for some syllables to be regarded as unfooted, and to be dominated directly by a prosodic word (Hayes 1995; for an overview in Optimality Theory, see Elenbaas & Kager 1999), and this strategy will be applied in the analysis of Kayardild below. While violations of (5.2d) are not ruled out on any *a priori* grounds here, it happens that the Kayardild data can be accounted for without positing the recursive embedding of prosodic constituents.

5.1.3 Syllable constituency

Kayardild syllables are assumed to contain at most one onset consonant. Any consonant which immediately precedes a vowel occupies the onset position of the syllable which the vowel heads. Codas may contain up to two consonants at the lexical level and three after the effects of β-final truncation. There is no sensitivity in the Kayardild stress system to the weight of a syllable, although interestingly the shape of the termination (T) is sensitive to the moraicity of the stem to which it attaches (cf Ch.3 §3.7.2).

5.1.4 On the definition of the breath group

Following Evans (1995a:63–64), the **breath group**, β can be defined as a stretch of speech bounded by planned pauses. Breath groups constitute genuine phonological domains in Kayardild, and are characterised at their right edge by truncation processes (cf Ch.2, §2.2.1.3), and by distinct intonation (§5.4.6 below). Phonologically speaking, a breath group boundary is not present before an unplanned pause, a fact which is apparent in the absence of characteristic pitch movements and β-final truncation during speech disfluencies for example (Evans 1995a:63). In addition, breath group boundaries are occasionally encountered in spontaneous speech even in the absence of actual, phonetic pauses — presumably this reflects instances where the speaker had planned to pause but then continued speaking immediately afterwards.

5.2 Issues in the identification of stress in Kayardild

Before proceeding to the phonological analysis of Kayardild stress, some comments are in order regarding the interpretation of empirical facts relating to stress, and regarding the analysis of Kayardild stress by Evans (1995a:79–83).

5.2.1 Regarding the position of stress

In Kayardild, there is no interaction between the segmental phonology and stress, and so there are no segmental diagnostics available for establishing the location of stress in a word. Consequently, and in the absence of metalinguistic judgements from native speakers, the task of identifying the location of stress falls to the analyst, and must be based upon perception. There are two reasons though, why the identification of stress in Kayardild is less than straightforward. These are discussed in a general manner in §5.2.1.1. Specifics are given in §5.2.1.2, along with a description of the methodology by which stress in Kayardild has been determined for the purposes of this study.

5.2.1.1 Two challenges to the identification of Kayardild stress

In many languages it is possible to infer the lexical prosodic structure of a word on the basis of its form when it is uttered on its own, as a citation form. In other languages though, this is not the case. The surface prosody of a citation form depends not only upon the lexical prosodic properties of the word itself, but also upon the properties of higher level prosodic constituents. A landmark advance in the study of Scandinavian accent for example was the dissertation of Bruce (1977), which argued for the necessity of differentiating between prosodic properties associated (i) with a word itself, (ii) with the structurally most prominent word in a phrase, and (iii) with the last word in a phrase. In citation forms, all three aspects of prosodic structure are conflated in a single word. It will be argued here that in Kayardild, there are certain prosodic properties of breath groups — particularly, the edges of breath groups — which must be held separate from the lexical prominence pattern of a word *per se*. My own experience in learning Kayardild was to have developed certain intuitions about the position of stress on the basis on citation forms, only to have those intuitions brought into question once I examined a large number of words which were neither initial nor final in their breath group. This then is the first of two challenges in determining the position of stress in Kayardild: the position of lexical stress is masked at the edges of breath groups (specifics will be discussed in §5.2.1.2).

Traditionally, it has been commonplace to assume that stress in most languages is associated with higher pitch, but research into the structural nature of intonation over the past few decades has refined this notion significantly (Ladd 1980; Ladd 1996; Gussenhoven 2004). Stress is now regarded as playing a crucial role in anchoring certain **pitch events** in an intonation contour. In many languages, to be sure, those pitch events correspond for the most part to pitch **peaks** that align temporally with the stressed syllable which is their anchor. However it is also possible for pitch **troughs** to align in such a manner, and in yet other cases, pitch peaks and troughs may align *relative to* an anchoring stressed syllable, but not temporally coincident with it. In a large number of Australian languages, it appears to be the norm for a pitch peak to be aligned either late in the stressed syllable to which it is anchored or even after it (Butcher forthcoming). There is also good evidence that in some languages of the world, the alignment of pitch peaks or troughs can be sensitive to segmental structure (see Atterer & Ladd 2004 for a review of recent research on this topic). In Kayardild, stressed syllables often associate with a pitch peak, but the position of that peak is quite variable, and may align anywhere from late in the stressed syllable to early in the syllable two steps to the right, though the peak will reliably align with a vowel in the syllable immediately after a stressed syllable if that vowel is phonologically long. What is more consistent in its timing is the base of the rise into a peak, which aligns at or near the very beginning of the stressed syllable (on which, more in §5.4 below).[2] An important corollary of these facts, given what is about to be said regarding vowel duration, is this: if a stressed syllable serves as an anchoring point for pitch peaks and troughs which predominantly occur outside of the stressed syllable itself, then it is not a contradiction to find a stressed syllable whose vowel is phonetically very short or even elided in a given word token; it is not necessary to suppose that stress 'shifts' when the nucleus of its associated syllable fails to appear at the phonetic level — because the pitch events for which the stressed syllable serves as an anchor, align *away from* that vowel, and consequently are not hindered from being realised when the vowel is phonetically absent.

Let us now move to vowel duration. In Kayardild, certain vowels, including some stressed vowels, are very short (Ch.2 §2.1.6.1). The key environments for vowel

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[2] By way of contrast, in most rise–fall accents in English, the pitch peak which aligns reliably, and within the stressed syllable, while the base of the rise occurs before the stressed syllable and its alignment is variable (Pierrehumbert 1980).

shortening are shown in (5.3), ordered from those in which shortening is most (5.3a) to least (5.3d) pronounced.

(5.3) Vowels which tend to be phonetically very short

	Vowel	Environment	
a.	High vowel V_S	$V(C_1)V_S(C_2)V$	C_1, C_2 = semivowel
b.	High vowel V_S	$V(C_1)V_S(C_2)V$	C_1, C_2 = liquid
c.	Low vowel V_S	$V(C_1)V_S(C_2)V$	C_1, C_2 = continuant
d.	High vowel V_S	$C_1V_S(C_2)V$ː	C_1 = non-continuant C_2 = continuant

To provide an insight into the significance for the analysis of Kayardild of recognising the existence of the phonetic effects listed in (5.3), the following anecdote is offered.

As part of the fieldwork conducted in conjunction with this project, one major area interest was the traditional knowledge of plants and shellfish held by the elder Kaiadilt women who were the last remaining Kayardild speakers, and many productive hours were spent conversing about such matters. One of the most basic points of knowledge about plants and shellfish is what is safe to eat and what is not. The stem for 'edible' in Kayardild is *diyaankuru* /t̪iaːnkuɻu/ ← /t̪ia-i-c-n-kuɻu/ 'eat-fMID-TH-fN-fPROP', and consequently a sizable number of tokens of the word form *diyaankuruyarrada* 'another edible one' were recorded. When these tokens were initially recorded, I was struck by the fact that phonetically, the last of the *u* vowels represented orthographically in '*diyaankuruyarrada*' was absent, and for many months I entertained the existence of a phonological process of /u/ elision, so that the surface phonological form of the word would be represented as /t̪iaːnkuɻjarata/.

Over a year later, while listening to tokens of words for their stress patterns, I had been finding that stress in the formal proprietive (fPROP) allomorph /kuɻɻu/ differed according to whether the surface form was (i) /kuɻɻu/ or /uɻɻu/ preceded by a consonant, in which case stress fell on the first syllable; or (ii) /uɻɻu/ preceded by a vowel, in which case stress placement was variable and seemingly in free variation.

After a period of considering an analysis in which this, and several other aspects of Kayardild stress varied freely, and in which vowels like the *u* in *diyaankuruyarrad* elided, it became clear that the common root to this variation was phonetic vowel length. Not only were some unstressed vowels phonetically very short or absent, but so too were some *stressed* vowels. The unstressed *u* in *diyaankuruyarrad* is phonetically absent or near-absent because it is a high vowel bordered on both sides by continuants — and so too is the initial, *stressed* /u/ in fPROP when fPROP surfaces as /uɻɻu/ preceded by a vowel. Once phonetic effects of this kind were taken into account, the system as a whole resolved itself into a more stable and regular shape. Nonetheless, the challenge remains when attempting to perceive Kayardild stress, that vowel duration is an often unreliable, if not entirely uninformative, cue.[3]

5.2.1.2 Specifics and ramifications

This section describes some of the phonetics associated with the edges of breath groups, then discusses what the ramifications are, for the expected prosodic nature of citation

[3] As mentioned in Ch.2 §2.1.6.1, vowel quality also appears to be largely uncorrelated with stress. Individual, stressed vowels can be quite centralised.

forms. After that, the methodology is described by which stress patterns were determined for the words which form the basis of the analysis presented in §5.3 below.

In a preliminary acoustic phonetic study (Round 2002; in prep.), it was found that segments at the left and right edges of breath groups in Kayardild undergo significant phonetic lengthening. In particular, segments in (i) the breath group initial CVC sequence, and (ii) the final CVC sequence, are long relative to comparable, breath group internal segments.

The first consequence of this is that in citation forms, which are both initial and final in a breath group, we expect lengthening in the initial and final syllables of the word. Now, Kayardild words are always stressed on their first syllable, but their last syllable only ever sounds stressed if it is breath group final. Whether this should be analysed as (i) a *lexical* prominence — perhaps one which comes into being as the result of prosodic reorganisation triggered by breath group final truncation — or (ii) a *breath group level* prominence, or (iii) merely a perceptual effect related to phrase final lengthening, is a difficult question to answer, and one which will not be resolved in this dissertation. Although the details of the analysis must be left for future research, one point can be mentioned now.

Breath group (β) final syllables often sound stressed. Also, β-final syllables often correspond to the *penultimate* syllables of words that are not β-final — this being because β-truncation often deletes a word final vowel, and with it, a word final syllables (e.g. /makua/ → /maku/ 'woman'). A reasonable hypothesis then is that β-final syllables sound stressed because they derive from lexically stressed, penulatimate syllables. However, it is not the case that the penultimate syllables of β-final words are all stressed, rather whether of not they are stressed depends on many factors, to be covered in §5.3 below. That is to say, if β-final syllables are stressed, it is not because of those syllables are lexically stressed in general.

The second consequence of segmental lengthening at the edges of Kayardild breath groups relates to the second syllable of a citation form. Because β-initial CVC lengthens, there is lengthening in the onset of the second syllable of β-initial words that begin with CVCV. In a citation form, this can result in the second syllable of a word (σ_2) sounding stressed in addition to the first.[4] This 'stress' is particular to words in β-initial postion though, and is not heard when a word is non-initial in β. Two hypotheses which could be considered with respect to this apparent, 'σ_2 stress' are (i) that σ_2 stress is true stress, added post-lexically to a word in breath group initial position, or (ii) that σ_2 stress is merely a perceptual effect related to segment lengthening. There is one key piece of evidence in favour of the latter analysis. Recall from above that in certain, quite specific segmental environments, vowels are phonetically very short. When the vowel of σ_2 occupies such an environment, the percept of σ_2 stress is typically absent. Thus, if σ_2 stress is true stress, then it is stress which appears under suspiciously complex segmental conditions. On the other hand, if 'σ_2 stress' is regarded merely a perceptual side-effect of segmental lengthening and shortening, then its conditioning can be well understood in terms of more general phonetic properties of Kayardild.

[4] The phonetic lengthening of an intervocalic consonant in English can correlate with stress on the vowels to either side of it (Liberman & Prince 1977:320; Hayes 1984:70–73).

We conclude with the methods by which Kayardild stress has been ascertained in the present study. Because stress on the final syllables of a word is systematically masked in breath group final position, only breath group non-final words in the corpus were used in arriving at judgements. Where possible, a comparison was made between several word tokens with comparable syllabic and morphological compositions. This was found to be necessary, because apart from the case of the initial syllable in a word, which is always stressed, there is often little that distinguishes the phonetics of stressed and unstressed syllables — as mentioned above, vowel duration and quality can be uninformative and as will we see in §5.4 below, stressed and unstressed syllables are not always intonationally distinct. Stress was then deduced abductively. The corpus contained enough unambiguous tokens that the fundamental properties of the system could be deduced. At that point, the data was examined again, to extract further generalisations, and the process reiterated. The resulting stress system described in §5.3 accords with the many hundreds of tokens examined, and is mutually consistent with the description of intonation in §5.4, in which pitch events are anchored to stressed syllables. For the most part the individual examples of stressed words cited in §5.3 are based on attested examples, though for expository reasons is has be preferable in some places to generalise away from the actual attested data; this has only been done in cases where there is no reasonable doubt as to what the stress pattern would be.

5.2.2 Evans (1995a) on Kayardild stress

Evans (1995a:79–83) presents an analysis of Kayardild stress which combines several cross-linguistically familiar elements with a small number which are typologically unusual.

Among the former is a predominantly word initial main stress, stress on long vowels, and stress on the first syllable of compound constituents and of several suffixes.

On Evans' analysis, most words which begin with CVCV carry stress on both the initial and the second syllable, however the second syllable of a word is not stressed if the word begins $C_1VC_2VC_3V$ where C_2 and C_3 are continuants. As discussed above, I prefer to analyse this 'σ_2 stress' as a perceptual consequence of breath group initial segment lengthening, and its absence as related to vowel shortening.[5]

The analysis in §5.3 broadly maintains Evans' approach to morphologically sensitive stress, though expands upon its scope. Stress falls on the first syllable of roots, and as in Evans' analysis, stress on suffixes is idiosyncratic: some suffixes will be analysed as underlyingly stressed, others are not.

The analysis in §5.3 parts ways with that of Evans regarding the phonological basis of stress. Evans posits stress on every long vowel, but the analysis here does not (although it is certainly true that pitch peaks associated with stressed syllables are attracted to long vowels in the next syllable). Evans posit a stress on words' penultimate syllables which is subsequently removed post-lexically except if the word is breath group final. For reasons discussed in §5.2.1.2 above, I do not follow that analysis.

[5] While some languages, including some Australian languages, do exhibit stress which is sensitive to onsets (Davis 1988), to my knowledge a language in which the stress of a syllable were sensitive both to its own onset and to that of the next syllable would be typologically unique.

5.2.3 Regarding phrasal and lexical prominence levels

In §5.3 three levels of prosodic prominence will be distinguished within the lexical representation of a word. The lowest, **unstressed** level corresponds to syllables which never serve as anchors for pitch events — formally speaking, unstressed syllables are never associated with an intonational pitch accent. They are represented prosodically as syllables which are not heads of feet.

The two other prominence levels will be referred to as **level 1** and **level 2 stress**, where level 2 is the higher. Note that these are labels of convenience; they do not correspond to *n*-ary stress features for example, but refer indirectly to distinct positions within a prosodic constituent structure. A level 2 stressed syllable is the head of a foot which itself is the head of a prosodic word, while a level 1 stressed syllable is the head of a foot which is not the head of a prosodic word.

It will be assumed that the principles of pitch accent assignment are sensitive to the lexical stress levels of syllables. Level 1 and level 2 stressed syllables are both potential anchoring sites for pitch accents, but pitch accents are often associated specifically with level 2 stressed syllables rather than level 1.

The lexical representation of a word need not possess a unique, most-prominent syllable. Although a word will alway possess at least one level 2 stressed syllable, it may also possess two or more, none of which is lexically more prominent than the others. At the post-lexical level however, additional prominences will be built which regularly do leave a word with a single, most prominent syllable. In the intonational system of Kayardild, the leftmost, level 2 stressed syllable in a breath group is often the most prominent of all. Likewise, when an intonational prominence is placed on a non-initial word in a breath group (as when it is focussed for example), a pitch accent conveying high prominence typically associates with the leftmost level 2 stressed syllable in the word. Since the 'leftmost level 2 stressed syllable' in a given domain can be calculated productively, it is not necessary to represent any given level 2 stress within a word as lexically more prominent than any other.

5.3 An analysis of Kayardild stress

The stress pattern of a Kayardild word is mostly governed by the word's morphological structure, though purely phonological factors also come into play in a typologically unremarkable fashion. Feet are trochaic and in general disyllabic (as can be seen in (5.4) below). Stress clash is never tolerated at the surface. Most feet are built so as to align with morphological constituents. In (5.4) it can be seen that feet align with the left edge of roots, and if there is enough space, with the right (the alignment at the right edge is different in nominal and in verbal roots). In addition, some suffixes are underlyingly stressed and hence drive foot placement to a degree (5.4k). Other feet are built on purely phonological grounds, in order that no two adjacent syllables go unfooted (feet of this kind can be seen in (5.4i,j)).

(5.4) Basic examples

v́ = level 2 stress; v̀ = level 1; (σ σ) = foot; [$_{\text{X}}$...] = morphological constituent

		Gloss	Prosodified word
Nominal roots	a.	‘fishtrap.T’	[$_{\text{Rt}}$ (ŋú ru) (wà ra)]
	b.	‘alone.T’	[$_{\text{Rt}}$ (kú na) (ɻùm pu)] a
	c.	‘grown up.T’	[$_{\text{Rt}}$ (cúm pu) ruŋ (kà ra)]
	d.	‘shoe.T’	[$_{\text{Rt}}$ (cá pu) ɳa (ŋàɲ ci)] a
Verbal roots	e.	‘walk around.fACT.T’	[$_{\text{Rt}}$ (ɻá cu) (rì] ca)
	f.	‘walk around.fCONS.T’	[$_{\text{Rt}}$ (ɻá cu) (rì] ca) ra
	g.	‘scratch.fACT.T’	[$_{\text{Rt}}$ (pú ɻu) ku (ɻà] t̪a)
	h.	‘scratch.fCONS.T’	[$_{\text{Rt}}$ (pú ɻu) ku (ɻà] t̪a) ra
No stressed suffix	i.	‘fire.T’	[$_{\text{Rt}}$ (já lu) (lù] a)
	j.	‘fire.fDU.T’	[$_{\text{Rt}}$ (já lu) (lù] jarŋ) ka
Stressed suffix	k.	‘fire.fUTIL.T’	[$_{\text{Rt}}$ (já lu) lu] (mà ra)

The main complication which will arise in the analysis of Kayardild stress pertains to conflicting preferences regarding the positioning of feet, as follows. Feet which are constructed for purely phonological reasons preferentially align to the *left*. That is, three otherwise unfooted syllables $\sigma_1\sigma_2\sigma_3$ will be footed as $(\sigma_1\sigma_2)\sigma_3$. In opposition to this trend is the preference for feet that align with morphological constituents to align to the *right*, so that if morphological factors call for both σ_1 and σ_2 in $\sigma_1\sigma_2\sigma_3$ to be stressed — which they cannot both be due to the ban on stress clash — then all else equal, the foot is built as $\sigma_1(\sigma_2\sigma_3)$. A key component in the analysis of Kayardild stress therefore is an account of the conflicting alignment preferences of the two types of feet.

In Ch.4, several potential architectures for Kayardild phonology were considered, and among them a number of multi-stratal architectures. In the case of stress, a coherent interpretation of conflicting foot-building preferences can be arrived at by assuming that morphologically-driven prosodic structure is built in an earlier stratum, at which point feet are preferentially built to the right, after which additional feet are built in a later stratum (in order that no two adjacent syllables go unfooted) at which point feet are preferentially built to the left. It will be assumed here that the earlier level is a lexical level, and that the later level is post-lexical. Significantly, at the later, post-lexical level, word final reduction applies, reducing word final /uu/ and /aa/ to /u/ and /a/ respectively (Ch.2,§ 2.2.1.4), giving rise to a certain amount of prosodic restructuring. In addition, it is assumed that other instances of lexical /aa/ become post-lexical /aː/.[6] An alternative, monostratal analysis is discussed and rejected in §5.3.10.

5.3.1 Nature of the analysis

A hypothesis which originally came out of studies of the interface between prosody and syntax (Selkirk 1986; Cohn 1986), is that prosodic structure is regulated to a large extent by the alignment of edges of various kinds of constituent with one another. Adopted into Optimality Theory under the rubric of Generalised Alignment (McCarthy & Prince 1993), the hypothesis has proven extremely productive, and forms one of main ingredients of the analysis of Kayardild below.

Alignment between constituents in Kayardild will be analysed in terms of two kinds of constraints. ANCHOR constraints (5.5) require that edges align, and are evaluated such that any departure from complete alignment is equally penalised. ALIGN constraints (5.6) are evaluated gradiently, so that non-aligning structures are more heavily penalised the greater the remove between the two edges at issue.

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[6] A parallel process, changing /uu/ to /uː/ is not found.

(5.5) E-ANCHOR(*x*,*y*)

General schema for all ANCHOR constraints defined in this chapter.

The syllable at edge E of **any** constituent of type *x* must also be at edge E of **some** constituent of type *y*, where:

E ∈ {Left, Right}
x,*y* ∈ ProsodicCategories ∪ GrammaticalCategories

A single violation is incurred if this condition is not met.

(5.6) E-ALIGN(*x*,*y*)

General schema for all ALIGN constraints defined in this chapter.

The syllable at edge E of **any** constituent of type *x* must also be at edge E of **some** constituent of type *y*, where:

E ∈ {Left, Right}
x,*y* ∈ ProsodicCategories ∪ GrammaticalCategories

A single violation is incurred for every syllable of distance between the two edges.

Other constraint types will be introduced below as needed.

5.3.2 General properties of Kayardild prosodic structure

Before we proceed to specific points of alignment between morphology and prosody in §§5.3.3–5.3.8, this section sets out some general properties of Kayardild prosodic structure and their analysis in constraint based terms.

Kayardild feet (Σ) are trochaic, due to undominated FTFORM (5.7), and the head foot of a prosodic word (ω) is its leftmost foot, due to undominated LEFTMOST (5.8). Kayardild does not exhibit any evidence of recursive prosodic domains, and so NONRECURSIVITY (5.9) is also undominated.

(5.7) FTFORM ;=L-ANCHOR(Hd(Σ),Σ)
Feet are trochaic.

(5.8) LEFTMOST ;=L-ANCHOR(Hd(ω),ω)
The leftmost syllable of a prosodic word's head foot is the leftmost syllable of the prosodic word.

(5.9) NONRECURSIVITY
No prosodic constituent of type *c* dominates another constituent of type *c*.

At the lexical level, the only feet constructed are those which align with certain morphological constituents. To capture the fact that no other feet are built, a specific (low) ranking will be used of constraint (5.10) which militates against all foot structure.

(5.10) *Σ
No feet.

Finally, Kayardild feet are analysed here as preferentially being disyllabic, though monosyllabic feet do arise if a word consists of nothing more than a single, monosyllabic root. The preference for disyllabicity is captured here by constraint (5.11). Given that monosyllabic feet do sometimes get built, we know that (5.11) is not undominated. Its precise ranking will be ascertained in the following sections.

(5.11) FOOTBINARITY (FTBIN)
A foot dominates precisely two syllables.

In sum, the constraints just set out above, and their rankings within the lexical stratum of the phonology — insofar as they can be stated at this point — are shown in (5.12).

(5.12) Undominated:
{ FtForm, Leftmost, Nonrecursivity}

*Σ FtBin

5.3.3 Nominal roots

We begin the survey of morphologically driven foot structure with nominal roots, but first a note of clarification regarding the contrast between root initial and word initial position.

Because all Kayardild words begin with a root, and because we will be considering words containing one root only (until §5.3.6), the data to follow will consistently conflate word initial and root initial position. To avoid systematic ambiguities related to this, let us look ahead and note that with the exception of phonological clitics, *all* word initial syllables carry a level 2 stress. In compounds though, root initial syllables often carry a level 1 stress. As such, we will need to attribute the level 2 stress on word initial syllables not to the root constituent, but to the word.

The analysis of word initial, level 2 stress will be this: by virtue of Leftmost ((5.8) above), a *prosodic* word begins with its head foot and thus, with a level 2 stress; and due to constraint (5.13), grammatical words left-align with a prosodic word.

(5.13) L-Anchor(GrWd,ω)
The leftmost syllable of any grammatical word is the leftmost syllable of a prosodic word.

Prosodic words extend all the way to the right edge of the grammatical word by virtue of (5.14).

(5.14) R-ALIGN(ω,GrWd)
Every prosodic word right-aligns with a grammatical word.
One violation is incurred for every syllable of distance between the two edges.

Constraint (5.13) is undominated and never violated. Violations of (5.14) do occur, though we will not encounter any until §5.3.7 below. Let us now move to the stress on nominal roots.

Examples of words built on nominal roots of one and two syllables are shown in (5.15). Prosodic word boundaries are indicated [...] and foot boundaries (...); level 2 stress on a syllable is indicated by an acute accent above its nuclear vowel, and level 1 stress by a grave accent.

(5.15) Nominal roots of one or two syllables

	Gloss	Underlying root	Surface root+T
a.	'south'	/ɻa/	[(ɻá a)]
b.	'east'	/ɻi/	[(ɻí a)]
c.	'country'	/ʈulk/	[(ʈúl ka)]
d.	'man'	/ʈaŋka/	[(ʈáŋ ka) a]
e.	'shade'	/calci/	[(cál ci) a]
f.	'water'	/ŋuku/	[(ŋú ku) a]
g.	'food'	/wuɻan/	[(wú ɻan) ta]

As we know, the constraints responsible for word initial, level 2 stresses are L-ANCHOR(GrWd,ω) and LEFTMOST, both of which are undominated. Being undominated, they outrank FTBIN, the constraint which militates against non-disyllabic feet. The effects of this ranking can be seen in the stressing of monosyllabic words built on monosyllabic roots, such as (5.15a): a non-disyllabic foot is built (i.e., FTBIN is violated) in order that the word can begin with a level 2 stress (i.e., that L-ANCHOR(GrWd,ω) and LEFTMOST are satisfied).

If a nominal root is long enough then it will contain, in addition to a foot at its left edge, a foot that aligns with its right edge. This foot will be a non-head within its prosodic word. Words built on nominal roots of four and five syllables are shown in (5.16).[7]

(5.16) Nominal roots of four or five syllables

	Gloss	Underlying root	Surface root+T
a.	'fishtrap'	/ŋuruwara/	[(ŋú ru) (wà ra)]
b.	'ignorant'	/puʈumpaɲi/	[(pú ʈum) (pà ɲi) a]
c.	'alone'	/kunaɻumpu/	[(kú na) (ɻùm pu) a]
d.	'grown up'	/cumpuɻuŋkara/	[(cúm pu) ruŋ (kà ra)]
e.	'shoe'	/capuŋaŋaɲci/	[(cá pu) ŋa (ŋàɲ ci) a]

The construction of the right-edge foot in a nominal root is analysed in terms of the constraint (5.17).

(5.17) R-ANCHOR(nRt,Σ)
The rightmost syllable of any nominal root is the rightmost syllable of a foot.

[7] Pentasyllabic roots are the longest attested in Kayardild. The vast majority of roots are just one, two or three syllables in length.

The relative ranking of (5.17) can be inferred from stress in trisyllabic roots, which are shown in (5.18). (Note that at this stage, we are not interested in accounting for the feet which get built at the post-lexical level.)

(5.18) Nominal roots of three syllables

	Gloss	Underlying root	Surface root+T	
			lexical	post-lexical
a.	'big'	/cuŋarpa/	[(cú ŋar) pa]	[(cú ŋar) pa]
b.	'shark'	/kulkici/	[(kúl ki) ci a]	[(kúl ki) (cì a)]
c.	'knowledgeable'	/muŋuru/	[(mú ŋu) ru a]	[(mú ŋu) (rù a)]
d.	'spear'	/wumpuɻuŋ/	[(wúm pu) ɻuŋ ka]	[(wúm pu) (ɻùŋ ka)]

In trisyllabic roots the left-edge foot is built, but not the right-edge foot. This is not because there is no space *per se* for two feet — one could build a disyllabic foot followed by a monosyllabic foot such as *[(cú ŋar) (pà)] for (5.18a), and doing so would obey R-ANCHOR(nRt,Σ), but it would contravene FTBIN. This in turn indicates that FTBIN must outrank R-ANCHOR(nRt,Σ).

Next, consider roots of four or more syllables. In these, R-ALIGN(nRt,Σ) does induce the building of a right-edge foot, and to do so it must rank above the anti-foot constraint *Σ ((5.10) above). Putting all this together with the constraint ranking from (5.12) above yields the ranking shown in (5.19).

(5.19) Undominated:

{FTFORM, LEFTMOST, NONRECURSIVITY, L-ANCHOR(GrWd,ω) }

FTBIN R-ALIGN(ω,GrWd)

R-ANCHOR(nRt,Σ)

*Σ

The ranking in (5.19) can be cross-checked with explicit arguments from tableaux. To economise on space, candidates which violate undominated constraints are not considered, and undominated constraints are not displayed in the tableaux.

The deductive argument which follows builds up the constraint ranking in (5.19), given the assumption that the undominated constraints are correctly identified and that the other four constraints in (5.19) are indeed what drives this part of the phonology.

To begin, we observe that the partial ranking || FTBIN » R-ANCHOR(nRt,Σ) || is evident in the evaluation of losing candidate (5.20b).

(5.20)

	/kulkici-a/ 'shark-T'	FTBIN	R-ALIGN (ω,GrW)	R-ANCH (nRt,Σ)	*Σ
☞	[(kúl ki) ci a]			1	1
a.	[(kúl ki) (cì) a]	W_1		L	W_2
b.	[(kúl ki ci) a]	W_1		L	
c.	[(kúl ki) (cì a)]			1	W_2
d.	[(kúl ki)] ci a		W_2	1	1

Likewise, the evaluation of losing candidate (5.21a) reveals the partial ranking || R-ANCHOR(nRt,Σ) » *Σ ||. Once unified, the two partial rankings just deduced yield || FTBIN » R-ANCHOR(nRt,Σ) » *Σ ||.

(5.21)

	/capuɳaɲaɲci-a/ ‘shoe-T’	FTBIN	R-ALIGN (ω,GrW)	R-ANCH (nRt,Σ)	*Σ
☞	[(cá pu) ɳa (ŋàɲ ci) a]				2
a.	[(cá pu) ɳa ŋaɲ ci a]			W_1	L
b.	[(cá pu) (ɳà ŋaɲ) (cì a)]			W_1	W_3
c.	[(cá) pu ɳa (ŋàɲ ci) a]	W_1			2
d.	[(cá pu ɳa) (ŋàɲ ci) a]	W_1			2
e.	[(cá pu ɳa) (ŋàɲ ci)] a	W_1	W_1		2

The ranking of R-ALIGN(ω,GrWd) with respect to other constraints will not become discernable until in §5.3.7. To economise on space, the R-ALIGN(ω,GrWd) constraint and candidates which violate it will not be displayed in tableaux until that section.[8]

Tableaux of words with additional syllable counts and root lengths are shown in (5.22)–(5.25). In general, candidates which violate undominated constraints are not shown, nor are undominated constraints displayed.

(5.22)

	/ɻa-a/ ‘south-T’	FTBIN	R-ANCH(nRt,Σ)	*Σ
☞	[(ɻá a)]		1	1
a.	[(ɻá) a]	W_1	L	1

[8] Until §5.3.7, any candidate which violates R-ALIGN(ω,GrWd) will always be harmonically bounded by some other candidate, just as (5.20d) is by the winner of (5.20) and just as (5.21e) is by (5.21d).

(5.23)

	/wuɻan-ta/ ‘food-T’	FtBin	R-Anch(nRt,Σ)	*Σ
☞	[(wú ɹan) ta]			$_1$
a.	[(wú ɹan) (tà)]	W_1		W_2
b.	[(wú ɹan ta)]	W_1	W_1	$_1$
c.	[(wú) ɹan ta]	W_1	W_1	$_1$

(5.24)

	/cuŋara-ø/ ‘big-T’	FtBin	R-Anch(nRt,Σ)	*Σ
☞	[(cú ŋar) pa]		$_1$	$_1$
a.	[(cú ŋar) (pà)]	W_1	L	W_2
b.	[(cú ŋar pa)]	W_1	L	$_1$
c.	[(cú) ŋar pa]	W_1	W_2	$_1$

(5.25)

	/puʈumpaɳi-a/ ‘ignorant-T’	FtBin	R-Anch(nRt,Σ)	*Σ
☞	[(pú ʈum) (pà ɲi) a]			$_2$
a.	[(pú ʈum) pa ɲi a]		W_2	L_1
b.	[(pú ʈum) pa (ɲì a)]		W_1	$_2$
c.	[(pú ʈum pa ɲi) a]	W_1		L_1
d.	[(pú) ʈum (pà ɲi) a]	W_1		$_2$

5.3.4 Verbal roots

Like words beginning with nominal roots, words beginning with a verbal root carry a level 2 stress on their initial syllable. Words built on verbal roots of one and two syllables are shown in (5.26). Roots such as these are too short to host any further foot structure. In (5.26a,b) the verbal root is followed by the lexically unstressed, cumulative thematic/termination (TH.T) morph /ca/~/t̪a/.

(5.26) Verbal roots of one and two syllables

	Gloss	Underlying root-TH	Surface root+TH.T
a.	'spear'	/ɻaː-c/	[(ɻáː ca)]
b.	'hit'	/pala-t̪/	[(pá la) t̪a]

If a verbal root is long enough, it will generally carry a level 1 stress on its final syllable. This can be analysed in terms of the head (i.e., stressed) syllable of a foot right-aligning with the stem. Verbal roots of three and four syllables are shown in (5.27).

(5.27) Verbal roots of three and four syllables

	Gloss	Underlying root-TH	Surface root+TH.T
a.	'walk around'	/ɻacuri-c/	[(ɻá cu) (rì ca)]
b.	'scratch'	/puɻukuɻa-t̪/	[(pú ɻu) ku (ɻà t̪a)]

In examples like (5.27) above, it is not clear whether the second foot in the word is aligning with the verbal root or with the word as a whole. Examples in (5.28) show verbal roots of three and four syllables followed by the lexically unstressed, disyllabic, formal consequential (fCONS) suffix. As can be seen, the second foot no longer aligns with the edge of the word, but does stand in the same position relative to the root.

(5.28) Verbal roots of three and four syllables, followed by fCONS

	Gloss	Underlying root-TH	Surface root+TH+fCONS+T
a.	'walk around'	/ɻacuri-c/	[(ɻá cu) (rì ca) ra]
b.	'scratch'	/puɻukuɻa-t̪/	[(pú ɻu) ku (ɻà t̪a) ra]

The alignment of the foot at the right edge of a verbal root is analysed here in terms of constraint (5.29).

(5.29) R-Anchor(vRt,σ̆)

The rightmost syllable of any verbal root is stressed (i.e., is the head of a foot).

To place constraint (5.29) within the ranking hierarchy, consider tableau (5.30). The partial ranking || R-Anchor(vRt,σ̆) » *Σ || is evident in the evaluation of losing candidate (5.30b).

(5.30)

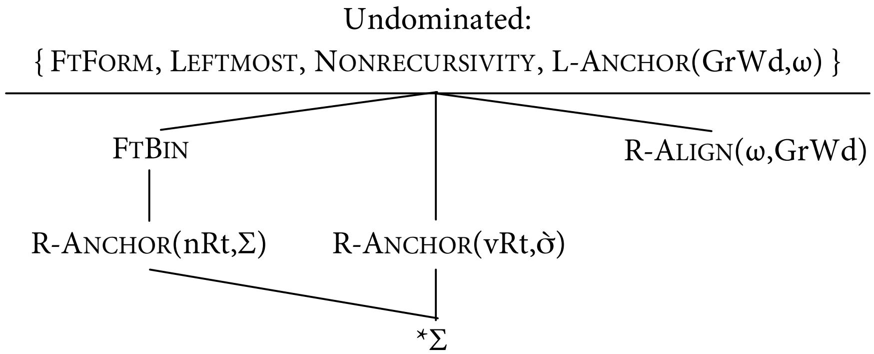
	/ɻacuri-c-ŋara-ø/ ‘walk-th-fcons-t’	FtBin	R-Anch(vRt,σ̆)	*Σ
☞	[(ɻá cu) (rì ca) ra]			2
a.	[(ɻá cu) (rì ca ra)]	W_1		2
b.	[(ɻá cu) ri ca ra]		W_1	L_1
c.	[(ɻá cu) ri (cà ra)]		W_1	2

Evidence for the ranking || FtBin » R-Anchor(vRt,σ̆) || will come from verbal roots followed by stressed suffixes in §5.3.5 below. There is no evidence for a ranking between R-Anchor(vRt,σ̆) and R-Align(nRt,Σ).[9]

Incorporating R-Anchor(vRt,σ̆) into the overall ranking yields (5.31).

[9] Hypothetically, evidence could be obtained from a compound comprised of a long verbal root immediately followed a disyllabic nominal root — in such a compound, R-Anchor(vRt,σ̆) and R-Align(nRt,Σ) could not both be respected without violating FtBin. However, compounds with this morphological structure do not exist in Kayardild.

(5.31)



Tableaux for verbal roots of one and four syllables are shown in (5.32)–(5.33). As usual, candidates which violate undominated constraints are not considered.

(5.32)

	/ɻaː-c-ŋara-ø/ ‘spear-TH-fCONS-T’	FtBin	R-Anch(vRt,σ̀)	*Σ
☞	[(ɻáː ca) ra]			1
a.	[(ɻáː ca ra)]	W_1		1
b.	[(ɻáː) ca ra]	W_1		1

(5.33)

	/puɻukuɻa-t̪-ŋara-ø/ ‘scratch-TH-fCONS-T’	FtBin	R-Anch(vRt,σ̀)	*Σ
☞	[(pú ɻu) ku (ɻà t̪a) ra]			2
a.	[(pú ɻu) (kù ɻa t̪a) ra]	W_1		2
b.	[(pú ɻu ku ɻa t̪a) ra]	W_1		L_1
c.	[(pú ɻu) ku ɻa t̪a ra]		W_1	L_1
d.	[(pú ɻu) (kù ɻa) (t̪à ra)]		W_1	W_3
e.	[(pú ɻu) (kù ɻa) t̪a ra]		W_1	2
f.	[(pú ɻu) ku ɻa (t̪à ra)]		W_1	2

5.3.5 Stressed suffixes

A large number of suffixes in Kayardild will be analysed here as underlyingly stressed on their first syllable. See Ch.3 §3.16 for a full list of suffixes marked for underlying stress.

One suffix, the formal dative (fDAT) /màɻ̣ù-ṯ/ is analysed as being underlyingly stressed on both its first and second syllable.[10]

The formal resultative (fRES) /irìɲ/ is underlyingly stressed on its second syllable. My corpus contains no word forms which would indicate whether or not it is also stressed on its first syllable.[11] It will be represented here with just one underlyingly stress.

5.3.5.1 Singly-stressed suffixes after nominal roots

We begin with suffixes which have just one underlying stress — the case of fDAT /màɻ̣ù-ṯ/ is held over until §5.3.5.3.

All singly-stressed suffixes that can follow nominal roots are initial-stressed. When singly-stressed suffixes attach to polysyllabic nominal stems, the underlying suffix stress surfaces, and does so without disturbing the normal stress pattern of the root. Examples are shown in (5.34).

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[10] The status of fDAT as the sole suffix with this latter stress pattern results in part from the mode of analysis of several other suffixes, specifically, thematic suffixes in their 'middle' forms. These also carry underlying stress on their first and second syllable, but this is analysed here as due to an initial stress on the basic suffix, plus a stress contributed by the formal middle (fMID) suffix which follows it. For example, the subjective ablative is analysed as /wùla-ì-c/ 'fOABL-fMID-TH' rather than /wùlàː-c/. For more on middle forms of thematic CASE suffixes, see Ch.3, §3.13.2.

[11] fRES attaches to verbal stems, and the required forms would consist of fRES attached to a trisyllabic verbal root, and followed by an underlyingly initial-stressed suffix. If the resultant post-lexical stress pattern were e.g. [(ŋá la) (m̀a -ṯ-i) riɲ- (cùː-ṉ ṯa)] we could conclude that fRES is *not* underlyingly stressed on its first syllable; if the post-lexical stress pattern were [(ŋá la) ma- (ṯ-ì riɲ-) (cùː-ṉ ṯa)], we could conclude that it is.

(5.34) Polysyllabic nominal roots + suffixes with a single (initial) underlying stress

	Gloss	Underlying	Surface (lexical representation)
a.	‘eye-fPRIV-T’	/mipuɻ-wàri-a/	[(mí puɻ) (wà ri) a]
b.	‘animal-fASSOC-T’	/jaɻput̪-ɳùru-a/	[(jáɻ pu) (nù ru) a]
c.	‘hole-fPROP-T’	/malci-kùɻu-a/	[(mál ci) (ù ɻu) a]
d.	‘ditch-fDEPO-TH.T’	/ŋan̪a-jàla-t̪a/	[(ŋá n̪a) (jà la) t̪a]
e.	‘sister-fPL-T’	/wakat̪a-pàlat̪-ta/	[(wá ka) t̪a (wà la) ta]
f.	‘mother-fUTIL-T’	/ŋamat̪u-màra-ø/	[(ŋá ma) t̪u (mà ra)]
g.	‘belly-fOABL-TH.T’	/paʈaka-wùla-t̪-a/	[(pá ʈa) ka (wù la) t̪a]
h.	‘big-fINCH-TH.T’	/cuŋarpa-wà-t̪a/	[(cú ŋar) pa (wà t̪a)]
i.	‘fishtrap-fPROP-T’	/ŋuruwara-kùɻu-a/	[(ŋú ru) (wà ra) (ù ɻu) a]
j.	‘middle-fORIG-T’	/ŋaɻuwara-wàːɲ-ta/	[(ŋá ɻu) (wà ra) (wàːn ta)]
k.	‘grown up-fINTENS-T’	/cumpuɻuŋkara -mìra-ø/	[(cúm pu) ruŋ (kà ra) (mì ra)]
l.	‘shoe-fASSOC-T’	/capuɳaŋaɲci-ɳùru-a/	[(cá pu) ɳa (ŋàɲ ci) (ɳù ru) a]

When a singly-stressed suffix follows a monosyllabic nominal root, the suffix stress fails to surface, as shown in (5.35).

(5.35) Monosyllabic nominal roots + suffixes with a single (initial) underlying stress

	Gloss	Underlying	Surface (lexical repr.)
a.	‘hair-fPRIV-T’	/cul-wàri-a/	[(cúl wa) ri a]
b.	‘here-fASSOC-T’	/ʈan-ɳùru-a/	[(ʈá nu) ru a]
c.	‘south-fINCH-TH.T’	/ɻa-wà-t̪a/	[(ɻá wa) t̪a]
d.	‘husband-fDEPO-TH.T’	/ʈun-jàla-t̪a/	[(ʈú ɲa) la t̪a]

The facts just introduced are analysed here in terms of an appropriately ranked faithfulness constraint (5.36) which demands that vowels[12] that are underlyingly marked as stressed, surface as such.

(5.36) MAX-σ̀
A vowel which is underlyingly marked to be stressed (i.e., to be the head of a syllable which is the head of a foot[13]) surfaces as such.

The constraint MAX-σ̀ is ranked above *Σ; if this were not so, underlying stresses would never surface. The partial ranking || MAX-σ̀ » *Σ || is evident in the evaluation of losing candidate (5.37a) below.

(5.37)

	/mipuɻ-wàri-a/ 'eye-fPRIV-T'	FTBIN	MAX-σ̀	R-ANCH(nRt,Σ)	*Σ
☞	[(mí puɻ) (wà ri) a]				2
a.	[(mí puɻ) wa ri a]		W_1		L_1
b.	[(mí puɻ) wa (rì a)]		W_1		2

---

[12] Following the assumption that underlying forms are not syllabified, it is vowels and not syllables which are underlyingly marked.

[13] Another possible approach to representing underlying prosodic structure would be to represent not the head of the foot, but its boundaries. This latter approach is adopted for example by Inkelas (1999) in an analysis of exceptional stress in Turkish. I prefer the former analysis for Kayardild, because the underlying head always coincides with segmental structure within the suffix, whereas right-hand foot boundaries do not do so in the case of monosyllabic suffixes. In Turkish, the boundary-based analysis is better motivated, since the prosodic head is sometimes outside of the suffix (e.g. in suffixes which induce a stress on the preceding syllable).

MAX-σ̀ is ranked below FTBIN, and hence underlying stress will not surface at the expense of building a monosyllabic foot. Given the partial ranking || MAX-σ̀ » *Σ || just established, the additional ranking || FTBIN » R-ANCH(nRt,Σ), MAX-σ̀ || is evident in the evaluation of losing candidate (5.38a).

(5.38)

	/cul-wàri-a/ 'hair-fPRIV-T'	ANCHOR (GrWd,ω)	FT BIN	MAX-σ̀	R-ANCH (nRt,Σ)	*Σ
☞	[(cúl wa) ri a]			1	1	1
a.	[(cúl) (wà ri) a]		W_1	L	L	W_2
b.	cul [(wá ri) a]	W_1		L	1	1
c.	[(cúl wa) (rì a)]			1	1	W_2
d.	[(cúl) wa ri a]		W_1	1	L	1

5.3.5.2 Suffixes after verbal roots

This section examines suffixes other than the formal negative (fNEG, which is dealt with in §5.3.5.4) that follow verbal roots,.

Suffixes with underlyingly stress, that attach to verbal roots are all initial-stressed except for fRES /irìɲ/. They surface as stressed only if doing so would not result in a clash with the word-initial stress. Following long verbal roots (of three or more syllables), which normally end in a stressed syllable, the underlying suffix stress surfaces even at the expense of the root-final stress. Examples are shown in (5.39).

(5.39) Underlyingly initial-stressed suffixes after verbal roots

	Gloss	Underlying	Surface (lexical repr.)
a.	'spear-TH-fPRIV-T'	/ɻaː-c-wàri-a/	[(ɻáː ca) ri a]
b.	'spear-TH-fRES-T'	/ɻaː-c-irìɲ-ta/	[(ɻáː ci) (rìn ta)]
c.	'spear-fRCP-TH.T'	/ɻaː-n̪t̪ù-t̪a/	[(ɻán̪ t̪u) t̪a]
d.	'spear-fMID-TH.T'	/ɻaː-ì-ca/	[(ɻá iː) ca]
e.	'hit-TH-fPRIV-T'	/pala-t̪-wàri-a/	[(pá la) (t̪à ri) a]
f.	'hit-TH-fRES-T'	/pala-t̪-irìɲ-ta/	[(pá la) t̪i (rìn ta)]
g.	'hit-fRCP-TH.T'	/pala-t̪ù-t̪a/	[(pá la) (t̪ù t̪a)]
h.	'hit-fMID-TH.T'	/pala-ì-t̪a/	[(pá laː) ca]
i.	'show-fMID-TH.T'	/maraː-ì-ca/	[(má ra) (ìː ca)]
j.	'take-TH-fPRIV-T'	/ŋalama-t̪-wàri-a/	[(ŋá la) ma (t̪à ri) a]
k.	'sit-TH-fRES-T'	/paɳkalti-c-irìɲ-ta/	[(páɳ kal) (tì ci) (rìn ta)]
l.	'take-fRCP-TH.T'	/ŋalama-t̪ù-t̪a/	[(ŋá la) ma (t̪ù t̪a)]
m.	'take-fMID-TH.T'	/ŋalama-ì-ca/	[(ŋá la) (màː ca)]
n.	'chase-fMID-TH.T'	/ʈuruaː-ì-ca/	[(ʈú ru) a (ìː ca)]
o.	'scratch-TH-fPRIV-T'	/puɻukuɻa-t̪-wàri-a/	[(pú ɻu) ku ɻa (t̪à ri) a]
p.	'scratch-TH-fRES-T'	/puɻukuɻa-t̪-irìɲ-ta/	[(pú ɻu) ku (ɻà t̪i) (rìn ta)]
q.	'scratch-fRCP-TH.T'	/puɻukuɻa-t̪ù-t̪a/	[(pú ɻu) ku ɻa (t̪ù t̪a)]
r.	'scratch-fMID-TH.T'	/puɻukuɻa-ì-ca/	[(pú ɻu) ku (ɻàː ca)]

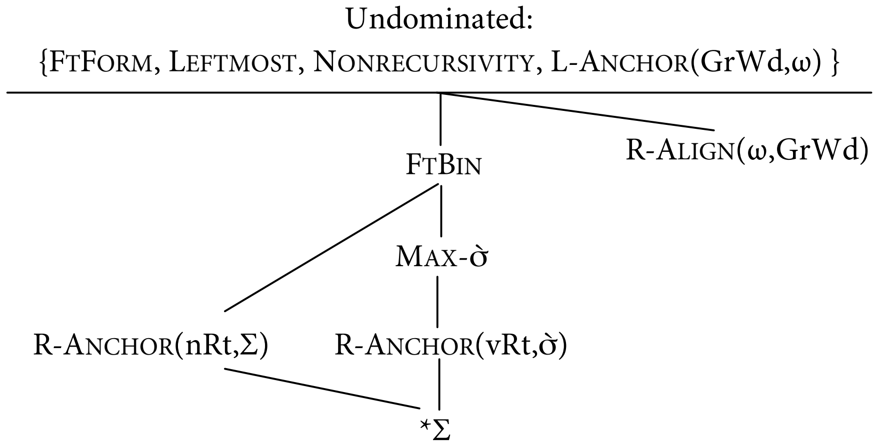
It was shown above that MAX-σ̀ ranks below undominated ANCHOR(GrWd,ω) and FTBIN, which is why underlying suffix stresses lose out to word-initial stress in examples such as (5.39a,c,d). On the other hand, the fact that the usual, final stress on a verbal root loses out to suffix stress in examples such as (5.39j,l,n,o,q) indicates is that MAX-σ̀ outranks R-ANCHOR(vRt,σ̀). The partial ranking || MAX-σ̀ » R-ANCHOR(vRt,σ̀) || is evident in the evaluation of losing candidate (5.40a):

(5.40)

	/ŋalama-t̪ù-t̪a/ 'take-fRCP-TH.T'	FTBIN	MAX-σ̀	R-ANCH(vRt,σ̀)	*Σ
☞	[(ŋá la) ma (t̪ù t̪a)]			1	2
a.	[(ŋá la) (mà t̪u) t̪a]		W_1	L	2
b.	[(ŋá la) ma t̪u t̪a]		W_1	1	L_1

Incorporating the partial rankings obtained in §5.3.5.1 and §5.3.5.2, we can now place MAX-σ̀ within the overall constraint ranking as shown in (5.41).

(5.41)



5.3.5.3 The surfacing of adjacent underlying stresses

Because FTBIN dominates MAX-σ̀, it is not possible for underlying stresses to surface on adjacent syllables. Examples in (5.42) show pairs of suffixes whose underlying stress is on vowels which surface in adjacent syllables. The consistent pattern is that the rightmost underlying stress surfaces at the expense of its neighbour to the left.

(5.42) Underlyingly stresses on vowels in surface-adjacent syllables

	Gloss	Underlying	Surface (lexical repr.)
a.	‘1-pl-fPOSS-fPROP-fOBL-T’	/ŋa-la-pàɲ-kùu-in̪t̪a-ø/	[(ŋa la) waɲ (cùːn̪ t̪a)]
b.	‘dead-fFACT-fRCP-TH.T’	/kuɻir-ɻù-t̪ù-t̪a/	[(kú ɻi) lu (t̪ù t̪a)]
c.	‘woman-fHALL-fMID-TH.T’	/maku-càni-ì-c-a/	[(má ku) ca (nìː ca)]
d.	‘hit-fRCP-TH-fPRIV-T’	/pala-t̪ù-t̪-wàri-a/	[(pá la) t̪u (t̪à ri) a]
e.	‘cut-TH-fRES-fANOTH-T’	/kala-t̪-irìɲ-jàrat̪-ta/	[(ká la) t̪i ri (ɲà ra) ta]

In (5.43), the two underlying stresses on fDAT /màɻù-t̪/ cannot both surface, and again, it is the rightmost stress which wins out.

(5.43) Underlyingly stresses on vowels in surface-adjacent syllables in fDAT

	Gloss	Underlying	Surface (lexical repr.)
a.	'south-fDAT-TH.T'	/ɻa-màɻ̣ù-t̪a/	[(ɻá ma) (ɻ̣ù t̪a)]
b.	'sea-fDAT-TH.T'	/mala-màɻ̣ù-t̪a/	[(má la) ma (ɻ̣ù t̪a)]
c.	'belly-fDAT-TH.T'	/paʈaka-màɻ̣ù-t̪a/	[(pá ʈa) ka ma (ɻ̣ù t̪a)]

These facts will be analysed here in terms of a low-ranked constraint (5.44), which favours feet that are closer to right edge of a word over those that are further from it.

(5.44) R-ALIGN(Σ,GrW)
The right edge of every foot aligns with the right edge of a grammatical word.
One violation is incurred for every syllable of distance between the two edges.

R-ALIGN(Σ,GrW) is ranked below all constraints which demand feet to be built; if it were not, then it would prevent feet from being built except at the right edge of the word. Its effect in deciding cases like those in (5.42) is shown in (5.45). The only difference in evaluation between the losing candidate (5.45a) and the attested form is in the violations of R-ALIGN(Σ,GrW).

(5.45)

	/kuɻ̣ir-ɻ̣ù-t̪ù-t̪a/ 'dead-fFACT-fRCP-TH.T'	FTBIN	MAX-ờ	R-ANCH (nRt,Σ)	*Σ	R-ALIGN (Σ,GrW)
☞	[(kú ɻ̣i) lu (t̪ù t̪a)]		1		2	3
a.	[(kú ɻ̣i) (lù t̪u) t̪a]		1		2	W_{3+1}
b.	[(kú ɻ̣i) lu t̪u t̪a]		W_2		L_1	L_4

Examples in (5.46) show words in which underlying stresses rest on vowels which at the surface appear in three adjacent syllables.

(5.46) Underlyingly stresses on vowels in three surface-adjacent syllables

	Underlying & Gloss	Surface (lexical repr.)
a.	/ŋa-ku-lu-pàɲ-màɻ̪ù-t̪a/	[(ŋa ku) lu (wàn ma) (ɻù t̪a)]
	‘1-2-pl-fPOSS-fDAT-TH.T’	
b.	/kuɻ̪ir-ɻ̪ù-t̪ù-t̪-wàri-a/	[(kú ɻi) (lù t̪u) (t̪à ri) a]
	‘dead-fFACT-fRCP-TH-fPRIV-T’	
c.	/ɲicu-iɲ-màɻ̪ù-t̪-n-wàri-a/	[(ɲí cin) (mà ɻun) (mà ri) a] [14]
	‘1sg-fPOSS-fDAT-TH-fN-fPRIV-T’	
d.	/ʈamuɻ̪u-càni-ì-c-kùu-in̪t̪a-ø/	[(ʈá mu) ɻu (cà niː) (cù un̪ t̪a)]
	‘corm-fHALL-fMID-TH-fPROP-fOBL-T’	

Once again, the rightmost stress surfaces. So too does the third-from-rightmost. Why this is so is shown in (5.47). Although candidates (5.47a–d) all perform better with respect to R-ALIGN(Σ,GrW) than the winning candidate does, they perform worse with respect to the higher-ranked constraint MAX-ʊ̀.

[14] Example (5.46c) is one case in which the first underlying stress on fDAT /màɻ̪ù-t̪/ surfaces. Strictly speaking though, given the account of post-lexical stress in §5.3.8 below, it could be argued that stress on (mà) in (5.46c) is post-lexical. Better evidence for the first underlying stress in fDAT is found in words such as *nguriwanguriwamaruthutha* ‘girl-girl-fDAT-fRECIP-TH.T’ [(ŋú ɻi) wa][(ŋú ɻi) wa (mà ɻu) (t̪ù t̪a)], where the (mà) cannot be accounted for as a post-lexical stress (the latter would land further to the left, on the sixth syllable, not the seventh).

(5.47)	/kuɻir-ɻù-t̪ù-t̪-wàri-a/ ‘dead-fFACT-fRCP-TH-fPRIV-T’	FTBIN	MAX-σ̆	*Σ	R-ALIGN (Σ,GrW)
☞	[(kú ɻi) (lù t̪u) (t̪à ri) a]		1	3	5+3+1
a.	[(kú ɻi) lu t̪u t̪a ri a]		W_3	L_1	L_5
b.	[(kú ɻi) lu t̪u (t̪à ri) a]		W_2	L_2	L_{5+1}
c.	[(kú ɻi) lu (t̪ù t̪a) ri a]		W_2	L_2	L_{5+2}
d.	[(kú ɻi) (lù t̪u) t̪a ri a]		W_2	L_2	L_{5+3}

Incidentally, forms such as those in (5.46) provide evidence that stress in Kayardild is not assigned cyclically. Consider the hypothetical, cyclic assignment of stress to *damurujaniijuuntha* (5.46a), as it is built up morph by morph in (5.48). In (5.48), prosodic word structure is not shown, and the usual ban on monosyllabic feet at the end of an output form has been relaxed — in a cyclic model of stress assignment this relaxing will be necessary if monosyllabic suffixes are ever to be stressed.

(5.48)

Cycle	Output
1.	(t̪á mu) ɻu
2.	(t̪á mu) ɻu (cà ni)
3.	(t̪á mu) ɻu ca (nìː)
4.	(t̪á mu) ɻu ca (nìːc)
5.	(t̪á mu) ɻu ca niː (cù u)
6.	(t̪á mu) ɻu ca niː (cù un̪) t̪a

The crucial effect here is that on each cycle, a new stress built on the final syllable will delete any stress on the penult. As such, the stress built on /ca/ in cycle 2 is deleted at cycle 3, and once deleted it cannot be re-instated on a later cycle. By contrast, in the ‘fell swoop’ model of stress assignment being considered here, the underlying stress on /ca/ is able to surface so long as at the surface it does not given rise to a FTBIN violation.

5.3.5.4 Formal negative /naŋ/

The formal negative (fNEG) suffix /nàŋ/ is underlyingly stressed, but its stress follows a different pattern to that of other suffixes, namely it surfaces even when the vowel of the following syllable is underlyingly stressed. Examples are shown in (5.49). Note that fNEG is not stressed at the end of a word, where stress would require the building of a monosyllabic foot.

(5.49) Stress on fNEG

	Gloss & Underlying	Surface (lexical representation)
a.	‘go-TH-fNEG.T’ /wara-c-nàŋ/	[(wá ra) na]
b.	‘go-TH-fNEG-fPROP-T’ /wara-c-nàŋ-kùː-ø/	[(wá ra) (nàŋ kuː)]
c.	‘go-TH-fNEG-fPROP-fOBL-T’ /wara-c-nàŋ-kùu-in̪t̪a-ø/	[(wá ra) (nàŋ kuːn̪) t̪a]
d.	‘go-TH-fNEG-fPROP-fLOC-T’ /wara-c-nàŋ-kùɻu-ki-a/	[(wá ra) (nàŋ ku) ɻu ja]
e.	‘walk-TH-fNEG.T’ /ɻacuri-c-nàŋ/	[(ɻá cu) (rì na)]
f.	‘walk-TH-fNEG-fPROP-T’ /ɻacuri-c-nàŋ-kùu-ø/	[(ɻá cu) ri (nàŋ kuː)]
g.	‘walk-TH-fNEG-fPROP-fOBL-T’ /ɻacuri-c-nàŋ-kùu-in̪t̪a-ø/	[(ɻá cu) ri (nàŋ kuːn̪) t̪a]
h.	‘walk-TH-fNEG-fPROP-fLOC-T’ /ɻacuri-c-nàŋ-kùɻu-ki-a/	[(ɻá cu) ri (nàŋ ku) ɻu ja]
i.	‘dead-fINCH-TH-fNEG-fPROP-fOBL-T’ /puka-wà-t̪-nàŋ-kùu-in̪t̪a-ø/	[(pú ka) wa (nàŋ kuːn̪) t̪a]
j.	‘ear-fDAT-TH-fNEG-fPROP-T’ /maral-màɻù-t̪-nàŋ-kùː-ø/	[(má ral) (mà ɻu) (nàŋ kuː)]

There are several ways to analyse this data. One could posit a uniquely special underlying representation for fNEG to which a special kind of faithfulness constraint applies,[15] but given that fNEG is the only suffix in its class, I prefer more direct solution of using a single, morphologically specific constraint, coupled with a normal representation of underlying stress.[16] This can be achieved by ranking constraint (5.50) crucially below FTBIN and above MAX-σ̀.

(5.50) L-ANCHOR(fNEG,Σ)
(The leftmost syllable of) any fNEG suffix coincides with the leftmost syllable of a foot.

The partial ranking || FTBIN » L-ALIGN(fNEG,Σ) || is evident in the evaluation of losing candidate (5.51a), given the already established ranking || MAX-σ̀ » R-ANCH(vRt,σ̀) ||.

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[15] A point worth considering is that the stress on fNEG precisely parallels the stress on the first syllable of a root — it surfaces even at the expense of a following underlying stress. On purely prosodic grounds then, one might consider marking fNEG as a 'root'. However, this would entail a need to distinguish the class of 'roots' that are relevant to morphology from the class which is relevant to phonology. A simpler grammar would result from treating fNEG as unique in some other way.

[16] It would also be possible to represent fNEG as underlyingly unstressed without changing the constraint ranking.

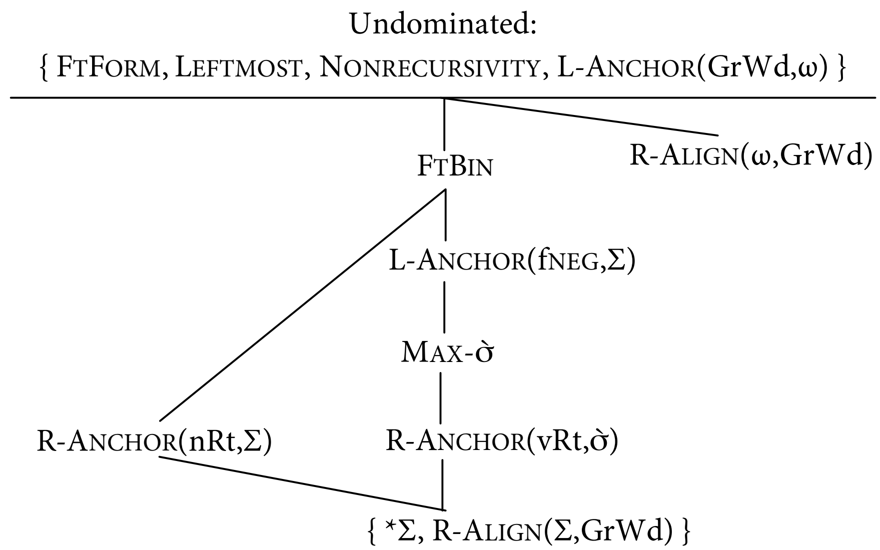
(5.51)		/ɻacuri-c-nàŋ/ ‘walk-TH-fNEG.T’	FTBIN	L-ANCH (fNEG,Σ)	MAX-ɞ̆	R-ANCH (vRt,ɞ̆)	*Σ
	☞	[(ɻá cu) (rì na)]		1	1		2
	a.	[(ɻá cu) ri (nà)]	W$_1$	L	L	W$_1$	2
	b.	[(ɻá cu) ri na]		1	1	W$_1$	L$_1$

The partial ranking || L-ALIGN(fNEG,Σ) » MAX-ɞ̆ || is apparent in the evaluation of losing candidate (5.52a), given the established ranking of || MAX-ɞ̆ » *Σ ||.

(5.52)		/puka-wà-t̪-nàŋ-kùu-in̪t̪a-ø/ ‘dead-fINCH-TH-fNEG-fPROP-fOBL-T’	FTBIN	L-ANCH (fNEG,Σ)	MAX-ɞ̆	R-ANCH (nRt,Σ)	*Σ
	☞	[(pú ka) wa (nàŋ kuːn̪) t̪a]			2		2
	a.	[(pú ka) (wà naŋ) (kùːn̪ t̪a)]		W$_1$	L$_1$		W$_3$
	b.	[(pú ka) wa naŋ (kùːn̪ t̪a)]		W$_1$	2		2

The constraints R-ALIGN(Σ,GrWd) from §5.3.5.3 and L-ANCHOR(fNEG,Σ) from this section fit into the overall lexical-level constraint ranking as shown in (5.53).

(5.53)



5.3.6 Compounds

This section and the next investigate stems which contain multiple roots, i.e., those containing compounding, or reduplication, or both.[17] In these words, root initial and word initial position is no longer always conflated. We begin with compounds.

Compound stems can consist solely of nominal roots, of one or more nominal roots followed by a verbal root, or in just one case, of two verbal roots. Some initial examples are shown in (5.54). In these cases all roots in the compound are polysyllabic.

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[17] On the morphological constituency of these stems see Ch.3, §§3.3–3.5, also §5.3.7.2 below on the role of prosody in the identification of reduplicated, non-lexical roots.

(5.54) Compounds of polysyllabic roots

	Gloss	Underlying	Surface (lexical repr.)
a.	‘very greedy-T’	/ciʈa-cuŋara-ø/ ‘greedy-big-T’	[(cí ʈa) (cù ŋa) ra]
b.	‘trigger happy-T’	/ʈ̪aʈa-cilaɻi-a/ ‘shoulder-sore-T’	[(ʈ̪á ʈa) (cì la) ɻi a]
c.	‘dim-T’	/jalulu-kuɲa-ø/ ‘fire-small-T’	[(já lu) lu (kù ɲa)]
d.	‘long tailed-T’	/kuɻʈura-ʈiŋkar-ta/ ‘tail-long-T’	[(kúɻ t̪u) ra (ʈìŋ ka) ra]
e.	‘bright-T’	/jalulu-cuŋara-ø/ ‘fire-big-T’	[(já lu) lu (cù ŋa) ra]
f.	‘large bellied-T’	/paʈaka-paʈaŋu-a/ ‘belly-large-T’	[(pá ʈa) ka (pà ʈa) ŋu a]
g.	‘kiss-TH.T’	/waɻa-paː-ca/ ‘mouth-bite-TH.T’	[(wá ɻa) (pàː ca)]
h.	‘look hard-TH.T’	/kuɳʈuŋ-kuri-ca/ ‘chest-look-TH.T’	[(kúɳ tu) (kù ri) ca]
i.	‘go the wrong way-TH.T’	/piʈin-wara-ca/ ‘mis-go-TH.T’	[(pí ʈin) (mà ra) ca]
j.	‘impregnate-TH.T’	/paʈaka-puɻʈi-ca/ ‘stomach-hit-TH.T’	[(pá ta) ka (pùɻ ti) ca]

The point to observe in (5.54) is that the compound stems are not stressed as if they were merely monomorphemic stems with the same syllable count: for example, (5.54a) is not stressed [(cí ʈa) cu (ŋà ra)] as a pentasyllabic, monomorphemic nominal stem would be; nor is (5.54h) stressed [(kúɳ tu) ku (rì ca)] as a tetrasyllabic, monomorphemic verbal stem would be. Instead, each root left-aligns with a foot.

The words in (5.55) all contain compound stems in which at least one root is monosyllabic. In these cases, roots left-align with feet but not at the expense of creating a monosyllabic foot. Monosyllabic feet are built neither word initially (5.55a–e,g–i), nor word finally (5.55f).

(5.55) Compounds involving monosyllabic nominal roots

	Gloss	Underlying	Surface (lexical repr.)
a.	‘small headed-T’	/ɳal-kuɲa-ø/ ‘head-small-T’	[(ɳál ku) ɲa]
b.	‘effeminate-T’	/kirk-maku-a/ ‘nose-woman-T’	[(kír ma) ku a]
c.	‘big headed-T’	/ɳal-cuŋara-ø/ ‘head-big-T’	[(ɳál cu) (ŋà ra)]
d.	‘deft handed-T’	/maɻ-muŋuru-a/ ‘hand-knowledgeable-T’	[(máɻ mu) (ŋù ru) a]
e.	‘clumsy footed-T’	/ca-puʈumpaɲi-a/ ‘foot-ignorant-T’	[(cá pu) ʈum (pà ɳi) a]
f.	‘yonder south-T’	/ŋanikin-ɻaː-ø/ ‘yonder-south-T’	[(ŋá ni) (kì laː)]
g.	‘nod off to sleep-TH.T’	/ɳal-ʈaa-t̪a/ ‘head-bob-TH.T’	[(ɳál ta) a t̪a]
h.	‘carry on one’s head-TH.T’	/ɳal-pati-ca/ ‘head-carry-TH.T’	[(ɳál pa) (tì ca)]
i.	‘blow one’s nose-TH.T’	/kirk-puː-ì-ca/ ‘nose-pull-fMID-TH.T’	[(kír pu) (ìː ca)]

The stressing of roots in compounds will be accounted for here in terms constraint (5.56).

(5.56) L-ANCHOR(Rt,Σ)
The leftmost syllable of any root is the leftmost syllable of a foot.

Constraint (5.56) ranks below FTBIN, as can be seen in the evaluation of losing candidates (5.57b,c).

(5.57)

	/ŋanikin-ɻaː-ø/ ‘yonder-south-T’	FtBin	L-Anch (Rt,Σ)	R-Anch (nRt,Σ)	*Σ	R-Align (Σ,GrW)
☞	[(ŋá ni) (kì laː)]		1	1	2	2
a.	[(ŋá ni) ki (làː)]	W_1	L	1	2	2
b.	[(ŋá ni ki) (làː)]	W_2	L	L	2	L_1
c.	[(ŋá ni) ki laː]		1	W_2	L_1	2

Tableau (5.58) illustrates the evaluation of compounds that begin with a monosyllabic root.

(5.58)

	/ŋ̣al-cuŋara-ø/ ‘head-big-T’	FtBin	L-Anch (Rt,Σ)	R-Anch (nRt,Σ)	*Σ	R-Align (Σ,GrW)
☞	[(ŋ̣ál cu) (ŋà ra)]		1	1	2	2
a.	[(ŋ̣ál) (cù ŋa) ra]	W_1	L	1	2	W_{1+3}
b.	[(ŋ̣ál cu) ŋa ra]		1	W_2	L_1	2
c.	[(ŋ̣ál) cu (ŋà ra)]	W_1	1	L	2	W_3
d.	[(ŋ̣ál) cu ŋa ra]	W_1	1	1	L_1	W_3
e.	[(ŋ̣ál cu ŋa ra)]	W_1	1	1	L_1	L

L-Anchor(Rt,Σ) can also be shown to outrank R-Anchor(nRt,Σ), and L-Anchor(fNeg,Σ). The partial ranking || L-Anchor(Rt,Σ) » R-Anchor(nRt,Σ) || is evident in the evaluation of losing candidate (5.59b).

(5.59)

	/ciṭa-cuŋara-ø/ ‘greedy-big-T’	FtBin	L-Anch (Rt,Σ)	R-Anch (nRt,Σ)	*Σ	R-Align (Σ,GrW)
☞	[(cí ṭa) (cù ŋa) ra]			1	2	3+1
a.	[(cí ṭa) cu ŋa ra]		W_1	1	L_1	L_3
b.	[(cí ṭa) cu (ŋà ra)]		W_1	L	2	L_3
c.	[(cí ṭa) (cù ŋa ra)]	W_1		L	2	L_3

Tableau (5.60) features a nominal–verbal compound stem followed by fNEG. The partial ranking || L-ALIGN(Rt,Σ) » L-ALIGN(fNEG,Σ) || is apparent in the evaluation of losing candidate (5.60b), given the established ranking || L-ANCH(fNEG,Σ) » R-ANCH(vRt,ŏ) ||.

(5.60)

/waɻa-paː-c-nàŋ-kùu-in̪t̪a-ø/ 'mouth-bite-TH-fNEG-fPROP-fOBL-T'	FTBIN	L-ANCH(Rt,Σ)	L-ANCH(fNEG,Σ)	R-ANCH(nRt,Σ)	MAX-ŏ	R-ANCH(vRt,ŏ)	*Σ	R-ALIGN(Σ,GrW)	*LAPSE
☞ [(wá ɻa) (pàː naŋ) (kùːn̪ t̪a)]			1		1		3	4+2	
a. [(wá ɻa) paː naŋ kuːn̪ t̪a]		W$_1$	1		W$_2$	W$_1$	L$_1$	L$_4$	W$_3$
b. [(wá ɻa) paː (nàŋ kuːn̪) t̪a]		W$_1$	L		1	W$_1$	L$_2$	L$_{4+1}$	
c. [(wá ɻa) paː naŋ (kùːn̪ t̪a)]		W$_1$	1		1	W$_1$	L$_2$	L$_4$	W$_1$
d. [(wá ɻa) (pàː naŋ) kuːn̪ t̪a]			1		W$_2$		L$_2$	4+2	W$_1$

Tableau (5.61) shows the evaluation of the same compound stem followed by an underlyingly stressed suffix.

(5.61)

/waɻa-paː-c-wàri-a/ 'mouth-bite-TH-fPRIV-T'	FTBIN	L-ANCH(Rt,Σ)	L-ANCH(fNEG,Σ)	R-ANCH(nRt,Σ)	MAX-ŏ	R-ANCH(vRt,ŏ)	*Σ	R-ALIGN(Σ,GrW)	*LAPSE
☞ [(wá ɻa) (pàː ca) ri a]					1		2	4+2	1
a. [(wá ɻa) paː ca ri a]		W$_1$		W$_1$	1	W$_1$	L$_1$	L$_4$	W$_3$
b. [(wá ɻa) paː (cà ri) a]		W$_1$			L	W$_1$	2	L$_{4+1}$	L
c. [(wá ɻa) (pàː ca) (rì a)]					1		W$_3$	4+2	L

5.3.7 Reduplication

Reduplication in Kayardild can apply to simple roots or to polymorphemic stems. Reduplicated units are repeated in their entirety. For an overview of the morphology and segmental phonology of reduplication, including the idiosyncrasies of the verbal thematic (TH), see Ch.3 §§3.3.3;3.4.3. Below, §5.3.7.1 sets out the stress patterns in reduplicated stems, and §5.3.7.2 considers the implications of the prosodic unity of reduplication that is found across semantically transparent and opaque subtypes, and across segmentally contrastive subtypes.

5.3.7.1 Stress and reduplication

The distribution of stressed syllables in reduplicated stems is parallels that in compounds, insofar as each root is left-aligned with a foot but not at the expense of building monosyllabic feet. The level of stress prominence is different though. Each reduplicated unit is left-aligned with a prosodic word (though again, not at the expense of building a monosyllabic foot), so that its leftmost syllable carries a level 2 stress. Examples of reduplicated roots are shown in (5.62).

(5.62) Reduplicated roots

	Underlying form & literal morphemic gloss	Surface (lexical repr.) & idiomatic gloss
a.	/wir-wir-ta/	[(wír wi) ra]
	‘rib-rib-T’	‘rib cage’
b.	/caː-c-caː-ca/	[(cáː caː) ca]
	‘poke into-TH-poke into-TH.T’	‘repeatedly poke into-ACT’
c.	/maɻŋan-maɻŋan-ta/	[(máɻ ŋan)][(máɻ ŋan) ta]
	‘girl-girl-T’	‘girls’
d.	/kantu-kantu-a/	[(kán tu)][(kán tu) a]
	‘blood-blood-T’	‘red’
e.	/pati-c-pati-ca/	[(pá tic)][(pá ti) ca]
	‘carry-TH-carry-TH.T’	‘repeatedly carry-ACT’
f.	/kuɳʈuŋkal-kuɳʈuŋkal-ta/	[(kúɳ ʈuŋ) kal][(kúɳ ʈuŋ) kal ta]
	‘mottled mudstone-mottled mudstone-T’	‘multicoloured’
g.	/kuʈala-kuʈala-t̪a/	[(kú ʈa) la][(kú ʈa) (là t̪a)]
	‘spear at-spear at-TH.T’	‘repeatedly spear at-ACT’

Words in which a root+suffix unit is reduplicated are shown in (5.63).

(5.63) Reduplicated root+suffix units

	Underlying form & literal morphemic gloss	Surface (lexical repr.) & idiomatic gloss
a.	/ʈulk-kùɻu-ʈulk-kùɻu-a/	[(ʈúl ku) ɻu][(ʈúl ku) ɻu a]
	‘country-fPROP-country-fPROP-T’	‘country owners; ghosts’
b.	/kiarŋ-wùt̪iɲ-kiarŋ-wùt̪iɲ-ta/	[(kí ar) (wù t̪in)][(kí ar) (wù t̪in) ta]
	‘two-fPLENTY-two-fPLENTY-T’	‘two each’
c.	/karma-t̪ù-karma-t̪ù-t̪a/	[(kár ma) t̪u][(kár ma) (t̪ù t̪a)]
	‘grasp-fRCP-grasp-fRCP-TH.T’	‘hold one another in place-ACT’
d.	/ŋarku-wà-t̪-ŋarku-wà-t̪a	[(ŋár ku) wa][(ŋár ku) (wà t̪a)]
	‘strong-fINCH-TH-strong-fINCH-TH.T	‘recover-ACT’

Words in which a compound is reduplicated are shown in (5.64).

(5.64) Reduplicated compounds

	Underlying form & literal morphemic gloss	Surface (lexical repr.) & idiomatic gloss
a.	/ɳal-piʈi-ɳal-piʈi-a/	[(ɳál pi) ʈi][(ɳál pi) ʈi a]
	‘head-bad-head-bad-T’	‘crazy-T’
b.	/kiʈil-taa-kiʈil-taa-t̪a/	[(kí ʈil) (tà a)][(kí ʈil) (tà a) t̪a]
	‘back-bob-back-bob-TH.T’	‘stretch one’s back-ACT’

Stress in reduplicated stems is analysed in terms of constraint (5.65) which demands that reduplicated units be left-aligned with prosodic words.

(5.65) L-ANCHOR(Redup,ω)
The leftmost syllable of any reduplicated unit is the leftmost syllable of a prosodic word.

If reduplicated stems are to be associated correctly with multiple prosodic words, then grammatical words will need to be prosodified either (i) into a recursively embedded prosodic word structure like [...[...[...]]]; or (ii) into a flat prosodic word structure like [...][...][...]. The assumption here is that recursive embedding does not occur, and as such L-ANCHOR(Redup,ω) must rank above R-ALIGN(ω,GrWd), the constraint which demands that every prosodic word be right-aligned with a grammatical word.

The partial ranking || L-ANCHOR(Redup,ω) » R-ALIGN(ω,GrWd) || is apparent in the evaluation of losing candidates (5.66a,d). If L-ANCHOR(Redup,ω) were ranked below R-ALIGN(ω,GrWd), then (5.66a,d), each with just a single prosodic word, would be more harmonic that the attested form.

(5.66)

/{maɻŋan}-{maɻŋan}-ta/ '{girl}-{girl}-T'	NONRECURSIVITY	FTBIN	L-ANCH(Redup,ω)	R-ALIGN(ω,GrWd)	L-ANCH(Rt,Σ)	R-ANCH(nRt,Σ)	R-ALIGN(Σ,GrW)	*Σ
☞ [(máɻ ŋan)][(máɻ ŋan) ta]				3			3+1	2
a. [(máɻ ŋan) (màɻ ŋan) ta]			W_1	L			3+1	2
b. [(máɻ ŋan)][(máɻ ŋan)] ta				W_{3+1}			3+1	2
c. [(máɻ ŋan) [(máɻ ŋan) ta]]	W_1			L			3+2	2
d. [(máɻ ŋan) maɻ ŋan ta]			W_1	L	W_1	W_1	L_3	L

L-ANCHOR(Redup,ω) is not undominated. It is violated in order to satisfy constraints such as LEFTMOST and FTBIN as can be seen in (5.67).

(5.67)

/{wir}-{wir}-ta/ '{rib}-{rib}-T'	LEFTMOST	FTBIN	L-ANCH(Redup,ω)	R-ALIGN(ω,GrWd)	L-ANCH(Rt,Σ)	R-ANCH(nRt,Σ)	R-ALIGN(Σ,GrW)	*Σ
☞ [(wír wi) ra]			1		1	1	1	1
a. [(wír)][(wí ra)]		W_1	L	W_2	L	1	W_2	W_2
b. [(wír)][wi ra]	W_1	W_1	L	W_2	1	1	W_2	1

In addition to R-ALIGN(ω,GrWd), L-ANCHOR(Redup,ω) also outranks the two constraints responsible for aligning feet with the right edge of roots, i.e., R-ANCHOR(nRt,Σ). The partial ranking || L-ANCHOR(Redup,ω) » R-ANCHOR(nRt,Σ) || is evident in the evaluation of losing candidates (5.68a–d).

(5.68)

	/{ɳal-piʈi}-{ɳal-piʈi}-a/ ‘{head-bad}-{head-bad}-T’	FtBin	L-Anch (Redup,ω)	R-Align (ω,GrWd)	L-Anch(Rt,Σ)	R-Anch (nRt,Σ)	R-Align (Σ,GrW)	*Σ
☞	[(ɳál pi) ʈi][(ɳál pi) ʈi a]			4	2	4	5+2	2
a.	[(ɳál pi) ʈi ɳal (pì ʈi) a]		W_1	L	2	L_3	L_{5+1}	2
b.	[(ɳál pi) ʈi (ɳàl pi) ʈi a]		W_1	L	2	4	5+2	2
c.	[(ɳál pi) ʈi ɳal][(pí ʈi) a]		W_1	L_3	2	L_3	L_{5+1}	2
d.	[(ɳál pi) ʈi ɳal] (pì ʈi) a		W_1	L_3	2	L_3	L_{5+1}	2

Illustrating the evaluation of other kinds of reduplicated stems, the stem in (5.69) is a reduplicated trisyllabic root, and in (5.70) is a reduplicated root+suffix.

(5.69)

	/{kuʈala}-{kuʈala}-t̪a/ ‘{spear}-{spear}-TH.T’	FtBin	L-Anch (Redup,ω)	R-Align (ω,GrWd)	L-Anch (Rt,Σ)	R-Anch (vRt,σ̆)	R-Align (Σ,GrW)	*Σ
☞	[(kú ʈa) la][(kú ʈa) (là t̪a)]			4		1	5+2	3
a.	[(kú ʈa) la (kù ʈa) (là t̪a)]		W_1	L		1	5+2	3
b.	[(kú ʈa) (là ku) ʈa (là t̪a)]		W_1	L	W_1	L	W_{5+3}	3
c.	[(kú ʈa) la][(kú ʈa) la t̪a]			4		W_2	5	L_2

(5.70)

/karma-t̪ù-karma-t̪ù-t̪a/ ‘grasp-fRCP-grasp-fRCP-TH.T’	FtBin	L-Anch (Redup,ω)	R-Align (ω,GrWd)	L-Anch(Rt,Σ)	Max-ð̀	R-Anch(vRt,ð̀)	R-Align (Σ,GrW)	*Σ
☞ [(kár ma) t̪u][(kár ma) (t̪ù t̪a)]			4		1	2	5+2	3
a. [(kár ma) t̪u (kàr ma) (t̪ù t̪a)]		W_1			1	2	5+2	3
b. [(kár ma) (t̪ù kar) ma (t̪ù t̪a)]		W_1		W_1	L	2	W_{5+3}	3
c. [(kár ma) (t̪ù kar) (mà t̪u) t̪a]		W_1		W_1	1	L_1	W_{5+3+1}	3
d. [(kár ma) t̪u][(kár ma) t̪u t̪a]			4		W_2	2	5+2	L_2

Just as compounding can feed reduplication, reduplication can feed compounding. Some example words are shown in (5.71), and an example candidate evaluation in (5.72).

(5.71) Compounding fed by reduplication

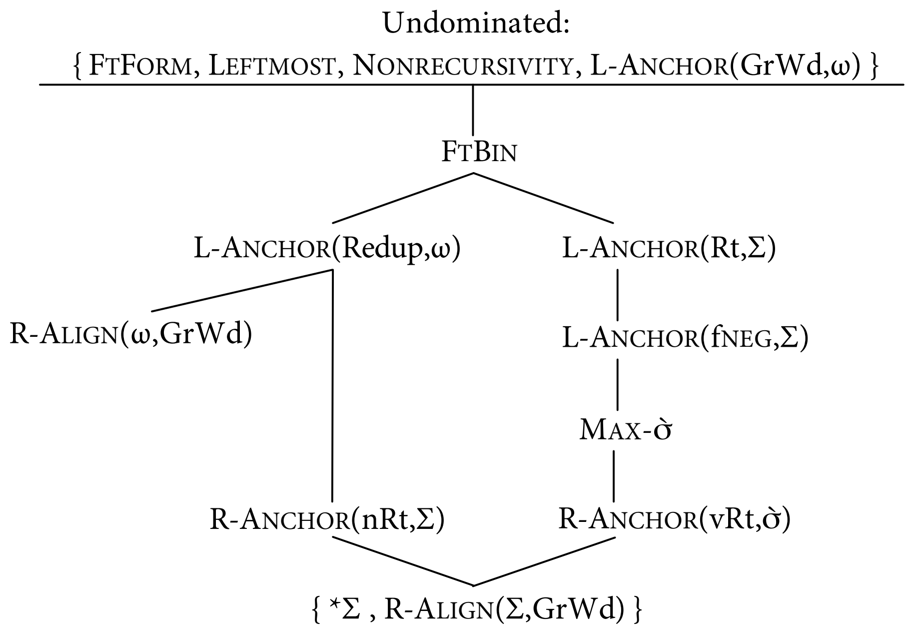
	Underlying form & literal morphemic gloss	Surface (lexical repr.) & idiomatic gloss
a.	/mala-pau-pau-a/ ‘sea-spittle-spittle-T’	[(má la)][(pá u)][(pá u) a] ‘rough seas’
b.	/ʈuɻ-par-par-ta/ ‘faeces-weak-weak-T’	[(ʈúɻ par)][(pá ra)] ‘suffering diarhoea’

(5.72)

/mala-{pau}-{pau}-a/ ‘sea-{spit}-{spit}-T’	FtBin	L-Anch (Redup,ω)	R-Align (ω,GrWd)	L-Anch (Rt,Σ)	R-Anch (nRt,Σ)	R-Align (Σ,GrW)	*Σ
☞ [(má la)][(pá u)][(pá u) a]			5+3			5+3+1	3
a. [(má la) (pà u)][(pá u) a]		W_1	L_3			5+3+1	3
b. [(má la)][(pá u) (pà u) a]		W_1	L_5			5+3+1	3
c. [(má la) (pà u) (pà u) a]		W_2	L			5+3+1	3
d. [(má la) pa u pa u a]		W_2	L	W_2	W_2	W_5	W_1

At this point, we have reached a final constraint ranking for the lexical level prosody of Kayardild, shown now in (5.73).

(5.73) Complete, lexical level constraint ranking



5.3.7.2 The prosodic unity of reduplication and its implications: non-lexical roots

This section and the next make two observations related to reduplication and prosody. The first pertains to semantic transparency, and the second to the prosodic unity of segmentally dissimilar reduplication patterns.

All examples in §5.3.7.1 above feature reduplicated stems which relate semantically to a simple stem through one or other of a small set of correspondences that recur in the lexicon of Kayardild, and which can also be found in many other Australian languages (Fabricius 1998). Among others, reduplicated nominal stems can denote plurals, or properties characteristic of the denotatum of the simple stem; reduplicated verbal stems can convey an action which is repeated, or performed by a subject composed of distributed individuals (see further Evans 1995a:200–01,89–90). Semantically transparent reduplication is not the only type found in Kayardild though. Other reduplicated stems may stand in an unpredictable semantic relationship with the simple stem (5.74), or may stand in no apparent semantic relationship to an extant simple stem (5.75), or may be comprised of non-lexicalised stems (cf Ch.3 §3.2), as in (5.76).

(5.74) Semantically unpredictable, though related reduplication

	Underlying form & literal morphemic gloss	Surface (lexical repr.) & idiomatic gloss
a.	/muruku-muruku-a/ ‘spear thrower-spear thrower-T’	[(mú ru) ku][(mú ru) ku a] ‘ready for war’
b.	/paʈu-paʈu-a/ ‘tough-tough-T’	[(pá ʈu)][(pá ʈu) a] ‘sparsely vegetated’
c.	/kuː-c-kuː-ca/ ‘bathe-TH-bathe-TH.T’	[(kúː cuː) ca] ‘swim-ACT’
d.	/cariː-c-cariː-ca/ ‘flee-TH-flee-TH.T’	[(cá riː)][(cá riː) ca] ‘limp-ACT’

(5.75) Semantically (apparently) unrelated reduplication

	Underlying form & literal morphemic gloss	Surface (lexical repr.) & idiomatic gloss
a.	/mala-mala-ø/ ‘sea-sea-T’	[(má la)][(má la)] ‘shell sp.’
b.	/kala-c-kala-ca/ ‘fly-TH-fly-TH.T’	[(ká la)][(cá la) ca] ‘do all over-ACT’

(5.76) Reduplication of non-lexical roots

	Gloss	Underlying form	Surface (lexical repr.)
a.	'crab sp.-T'	/paɳ-paɳ-ta/	[(páɳ paɳ) ta]
b.	'road-T'	/jupu-jupu-a/	[(jú pu)][(jú pu) a]
c.	'old woman-T'	/makal-makal-ta/	[(má kal)][(má kal) ta]
d.	'vine sp.-T'	/kilili-kilili-a/	[(kí li) li][(kí li) li a]
e.	'stingray sp.-T'	/mutulu-mutulu-a/	[(mú tu) lu][(mú tu) lu a]

There are three reasons for recognising forms such as (5.75a–b) and (5.76a–e) as reduplicated rather than merely consisting of accidentally repeated strings of segments. First, regarding the frequency of reduplicated non-lexical roots in the lexicon: there are many more such words of this type than one would expect if the repetition were accidental. Second, regarding root structure: there are no morphologically simple, nominal roots over five syllables long, and none over three syllables long which end in a consonant, yet there are several stems comprised of reduplicated non-lexical roots which defy these generalisations. Third, regarding prosody: (i) when stems comprised of reduplicated, trisyllabic, non-lexical, nominal roots are stressed, they are stressed on the first and fourth syllables, as [(σ́σ)σ][(σ́σ)σ] and not on the first and fifth, [(σ́σ)σσ(σ̀σ)], as one would expect for a monomorphemic, hexasyllabic nominal root; (ii) likewise, the verb /kalacala-c/ 'do all over' which is not obviously related to /kala-c/ 'fly' is stressed on its first and third syllables, as [(σ́σ)][(σ́σ)-] and not on the first and fourth, [(σ́σ)σ(σ̀-], as one would expect for a monomorphemic, tetrasyllabic verbal root; (iii) there is indirect evidence from post-lexical vowel shortening that reduplicated, disyllabic, non-lexical, nominal roots carry level 2 stresses not level 1: the reduplicated non-lexical stem 'rainbow-T' /t̪uat̪ua-ø/ → [(t̪ú a)][(t̪ú a)] for example does not undergo vowel shorting to [t̪uat̪wa], where a comparable form such as ‘large-T’ /paʈaŋu-a/ → [(pá ʈa) (ŋù a)] is regularly realised as [paʈaŋwa].

5.3.7.3 The prosodic unity of reduplication and its implications: morphological indices

Segmentally, the phonological modifications which apply to consonant clusters at the boundaries between adjacent, reduplicated units may be those of the ‘regular’, ‘leniting’ or ‘deleting’ phonology (Ch.4 §4.2). Examples above have all contained modifications from the regular phonology. Examples containing modifications from the other two classes appear in all semantic subtypes of reduplication, from the semantically regular (5.77a,b), through idiosyncratic (5.77c,d) to the reduplication of non-lexical roots (5.77e,f). The leniting phonology modifies /p/ → /w/ and /c/ → /j/ at the start of the second copy of the reduplicant in (5.77b,c,d,f), and the deleting phonology removes /k/ in (5.77a,e).

(5.77) Reduplication involving ‘leniting’ and ‘deleting’ modifications

	Underlying form & literal morphemic gloss	Surface (lexical repr.) & idiomatic gloss
a.	/kamar-kamar-ta/ ‘stone-stone-T’	[(ká ma)][(rá ma) ra] ‘gravel-T’
b.	/paʈaŋu-paʈaŋu-a/ ‘large-large-T’	[(pá ʈa) ŋu][(wá ʈa) ŋu a] ‘very large-T’
c.	/palar-palar-ta/ ‘white-white-T’	[(pá lar)][(wá la) ra] ‘egg white-T’
d.	/cunku-cunku-a/ ‘straight-straight-T’	[(cún ku)][(jún ku) a] ‘in return-T’
e.	/kulur-kulur-ta/ ‘intestine$_{\text{NL}}$-intestine$_{\text{NL}}$-T’	[(kú lu)][(rú lu) ra] ‘intestine-T’
f.	/puku-puku-a/ ‘vine$_{\text{NL}}$-vine$_{\text{NL}}$-T’	[(pú ku)][(wú ku) a] ‘vine sp.-T’

The observation to be made here is that although the reduplicated stems in (5.77) differ in their segmental phonology from the reduplicated stems encountered earlier, they behave in exactly the same fashion with respect to prosody. Conversely, there is absolutely no prosodic aspect of the words' structure which could be argued to cause or to trigger one class of segmental modifications or the other.[18]

5.3.8 Post-lexical prosodic phonology

This section on post-lexical prosodic phonology begins with the construction of post-lexical feet and the preservation or otherwise of lexical prosodic structure at the post-lexical level, in §5.3.8.2. The effects of β-truncation are discussed in §5.3.8.3 and the prosodic integration of the phonological enclitic /ɳaː/ 'now' is analysed in §5.3.8.4.

Certain assumptions will be made regarding the segmental structure of words at the post-lexical level. Word final, lexical /uu/ becomes /u/ post-lexically, and word final /aa/ which follows a base of two or more morae becomes /a/ (Ch.2 §2.2.1). All other lexical /aa/ sequences become /aː/ post-lexically. Finally, it will be assumed that the segmental representation over which post-lexical prosodic structure is built does not yet reflect the effects of the phonetic processes of vowel shortening and elision which were mentioned in Ch.2, §2.1.6.4 and in §5.2 above.

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[18] Likewise, there is no correlation between semantic subtypes and segmental subtypes of reduplication, and all semantic subtypes are equivalent in terms of their prosodic behaviour.

5.3.8.1 Post-lexical foot loss

When the lexical strings /uu/ and /aa/ become post-lexical /u/, /a/ or /aː/, a syllable is lost. Often this also results in the loss of a foot, and correspondingly, the loss of the stressed status of its head syllable. Examples are shown in (5.78a,b,c). As can be seen in (5.78d) though, foot loss will not occur if its effect would be to leave a prosodic word without a head foot.

(5.78)

Lexical and subsequent post-lexical prosodification: foot loss			
a.	/ʈaŋka-kùu-ø/ 'man-fPROP-T' → [(ʈáŋ ka) (ù u)] → [(ʈáŋ ka) u]	b.	/ʈan-ki-nàa-ø/ 'here-fLOC-fABL-T' → [(ʈán ki) (nà a)] → [(ʈán ki) na]
c.	/kapa-t̪-t̪aa-t̪-wari-a/ 'find-TH-return-TH-fPRIV-T' → [(ká pa) (t̪á a) (t̪á ri) a] → [(ká pa) t̪aː (t̪á ri) a]	d.	/ɻa-a/ 'south-T' → [(ɻá a)] → [(ɻáː)]

Foot loss can be accounted for with the assumption that every prosodic word must have a head (cf §5.1.2) plus the constraint ranking shown in (5.79), where the two faithfulness cover constraints, FAITH-ω and FAITH-Σ, are defined in (5.80)–(5.81). FAITH-ω is a temporary constraint which will be replaced when we come to the phonology of clitics in §5.3.8.4 below.

(5.79) || FAITH-ω » FTBIN » FAITH-Σ ||

(5.80) FAITH-ω (Temporary constraint)

All prosodic word structure in the input is present in the output.

Specifically, if ω is an input prosodic word, then it has an output correspondent ω′. In addition, if ω and ω′ are corresponding input and output prosodic words, then all output feet and syllables whose input correspondents are dominated by ω, are dominated by ω′. One violation is incurred for any departure from this.

(5.81) FAITH-Σ

All foot structure in the input is present in the output.

Specifically, if Σ is an input foot, then it has an output correspondent Σ′. In addition, if Σ and Σ′ are corresponding input and output prosodic words, then all output syllables whose input correspondents are dominated by Σ, are dominated by Σ′. One violation is incurred for any departure from this.

Tableaux corresponding to examples (5.78a) and (5.78d) are shown in (5.82) and (5.83). The partial ranking || FTBIN » FAITH-Σ || is evident in the evaluation of losing candidate (5.82a), and given this, || FAITH-ω » FTBIN || is evident in the evaluation of (5.83a).

(5.82)

	[(ʈáŋ ka) (ù u)] ‘man-fPROP-T’	FAITH-ω	FTBIN	FAITH-Σ
☞	[(ʈáŋ ka) u]			1
a.	[(ʈáŋ ka) (ù)]		W 1	L

(5.83)

	[(ɻá a)] ‘south-fPROP-T’	FAITH-ω	FTBIN	FAITH-Σ
☞	[(ɻáː)]		1	
a.	ɻaː	W 1	L	W 1

5.3.8.2 Post-lexical foot building

At the post-lexical level, strings of two or more adjacent syllables are never entirely unfooted. Feet are built if necessary to ensure that this is so. Examples are shown in (5.84). Note that in (5.84g,h,l), foot loss has occurred in addition to foot building.

(5.84) Lexical and subsequent post-lexical prosodification

a. /kulkici-a/ ‘shark-T’ → [(kúl ki) ci a] → [(kúl ki) (cì a)]	b. /ciʈapiri-a/ ‘bird sp.-T’ → [(cí ʈa) (pì ri) a] → [(cí ʈa) (pì ri) a]
c. /ʈat̪in-ki-a/ ‘that-fLOC-T’ → [(ʈá tin) ki a] → [(ʈá tin) (kì a)]	d. /kalaŋiɲ-ki-a/ ‘old-fLOC-T’ → [(ká la) ŋiɲ ci a] → [(ká la) (ŋìɲ ci) a]
e. /kamar-in̪t̪a-ø/ ‘stone-fOBL-T’ → [(ká ma) riɲ ca] → [(ká ma) (rìɲ ca)]	f. /wumpuʈuŋ-in̪t̪a-ø/ ‘shark-fOBL-T’ → [(wúm pu) ɻu ŋiɲ ca] → [(wúm pu) (ɻù ŋiɲ) ca]
g. /caʈi-ki-ɻiŋ-ki-nàa-ø/ ‘group-fLOC-fALL-fLOC-fABL-T’ → [(cá ʈi) ɻiŋ ki (nà a)] → [(cá ʈi) (ɻìŋ ki) na]	h. /ʈat̪in-ki-ɻiŋ-ki-nàa-ø/ ‘that-fLOC-fALL-fLOC-fABL-T’ → [(ʈá tin) ki ɻiŋ ki (nà a)] → [(ʈá tin) (kì ɻiŋ) (kì na)]
i. /jiː-c-arma-t̪-ŋara-in̪t̪a-ø/ ‘put-TH-fCAUS-TH-fCONS-fOBL-T’ → [(jíː car) ma t̪a ran̪ t̪a] → [(jíː car) (mà t̪a) (ràn̪ t̪a)]	j. /waʈi-c-arma-t̪-ŋara-n̪t̪a-ø/ ‘remove-TH-fCAUS-TH-fCONS-fOBL-T’ → [(wá ɻi) car ma t̪a ran̪ t̪a] → [(wá ɻi) (càr ma) (ʈ̪à ran̪) t̪a]
k. /puʈukuʈa-t̪u-t̪a/ ‘scratch-fRCP-TH.T’ → [(pú ɻu) ku ɻa (ʈ̪ù t̪a)] → [(pú ɻu) (kù ɻa) (ʈ̪ù t̪a)]	l. /ʈat̪in-kiarŋ-ki-nàpa-kuu-ø/ ‘that-fDU-fLOC-fABL-fPROP-T’ → [(ʈá t̪in) ki arŋ ki (nà pa) (ù u)] → [(ʈá t̪in) (kì arŋ) ki (nà pa) u]

The pattern which emerges from the data in (5.84) is that feet are built as far to the *left* as possible, and only disyllabic feet are built. To reflect this, the post-lexical constraint ranking from (5.79) above can be enhanced as shown in (5.85). Undominated *LAPSE is defined in (5.86); low-ranking L-ALIGN(Σ,GrWd) is a standard ALIGN constraint, (5.87).

(5.85) || *LAPSE, FAITH-ω » FTBIN » FAITH-Σ » L-ALIGN(Σ,GrWd) ||

(5.86) *LAPSE
The output does not contain adjacent, unfooted syllables.

(5.87) L-ALIGN(Σ,GrWd)
Every foot aligns with the left edge of a prosodic word.
One violation is incurred for every syllable of distance between the two edges.

Low ranking L-ALIGN(Σ,GrWd) has the effect of pulling newly built feet to the left, if there is any question over where they would be build. Example tableaux are provided in (5.88)–(5.90).

In (5.88), it can be seen that the only difference between the winning candidate and loser (5.88b) is their evaluation by L-ALIGN(Σ,GrWd). The partial ranking || *LAPSE » L-ALIGN(Σ,GrWd) || is apparent in the evaluation of losing candidate (5.88c).

(5.88)

	[(wúm pu) ɻu ŋiɲ ca] 'shark-fOBL-T'	*LAPSE	FAITH-ω	FTBIN	FAITH-Σ	L-ALIGN (Σ,GrWd)
☞	[(wúm pu) (ɻù ŋiɲ) ca]					$_{2}$
a.	[(wúm pu) (ɻù ŋiɲ) (cà)]			W_1		W_{2+4}
b.	[(wúm pu) ɻu (ŋìɲ ca)]					W_3
c.	[(wúm pu) ɻu ŋiɲ ca]	W_2				L
d.	[(wúm pu) (ɻù) ŋiɲ ca]			W_1		$_{2}$

The partial ranking || FTBIN » L-ALIGN(Σ,GrWd) || is evident in the evaluation of losing candidate (5.89b).

(5.89)	[(jíː car) ma t̪a ran̪ t̪a] ‘put-th-fcaus-th-fcons-fobl-t’	*Lapse	Faith-ω	FtBin	L-Align (Σ,GrWd)
☞	[(jíː car) (mà t̪a) (ràn̪ t̪a)]				$_{2+4}$
a.	[(jíː car) (mà t̪a) (ràn̪) t̪a]			W_1	$_{2+4}$
b.	[(jíː car) (mà) (t̪à ran̪) t̪a]			W_1	L_{2+3}
c.	[(jíː car) (mà t̪a) ran̪ t̪a]	W_1			L_2
d.	[(jíː car) ma t̪a ran̪ t̪a]	W_3			L

The fact that Faith-Σ also outranks L-Align(Σ,GrWd) is apparent in the evaluation of (5.90b).

(5.90)	[(kú ru) (wà ɳa)] ‘bush sp.-t’[19]	*Lapse	Faith-ω	FtBin	Faith-Σ	L-Align (Σ,GrWd)
☞	[(kú ru) (wà ɳa)]					$_2$
a.	[(kú ru) wa ɳa]	W_1			W_1	L
b.	[ku (rú wa) ɳa]				W_1	L_1
c.	[ku ru (wà ɳa)]	W_1			W_1	$_2$

5.3.8.3 Post-lexical stress and β-truncation

The post-lexical process of β-truncation often deletes the final vowel from the lexical representation of a word (Ch.2, 2.2.1.3), and correspondingly some degree of prosodic reorganisation might be expected to apply. However, as discussed in §5.2.1 above, it is not yet clear what the appropriate interpretation is of the prosodic prominence which is perceived in the final syllables of a breath group. For that reason, the task of providing a full account of stress and β-truncation is left for future research.

[19] The underlying form is /kuruwaɳa-ø/.

5.3.8.4 The phonological clitic na *'now'*

Kayardild possesses a small number of phonological enclitics (Ch.3, §3.11). The prosodification of these is illustrated in this section with the example of *na* /ɳa/ 'now'.

The particle /ɳa/ 'now' does not bear its own stress, but rather behaves prosodically as if it were the final syllable of the preceding word. Examples of words followed by /ɳa/ are shown in (5.91).

(5.91) Encliticisation of /ɳa/ (underlying → lexical → post-lexical)

a.	/mut̪a-a/ /ɳa-a/ 'much-T' 'now-T' → [(mú t̪a)] ɳaa → [(mú t̪a) ɳa]	b.	/ʈan-ta/ /ɳa-a/ 'here-T' 'now-T' → [(ʈán ta)] ɳaa → [(ʈán ta) ɳa]
c.	/pari-ca/ /ɳa-a/ 'crawl-TH.T' 'now-T' → [(pá ri) ca] ɳaa → [(pá ri) (cà ɳa)]	d.	/ʈan-ki-a/ /ɳa-a/ 'here-fLOC-T' 'now-T' → [(ʈán ki) a] ɳaa → [(ʈán ki) (à ɳa)]
e.	/kampuɻi-c-ta-ø/ /ɳa-a/ 'talk-TH-fDES-T' 'now-T' → [(kám pu) (ɻì ta)] ɳaa → [(kám pu) (ɻì ta) ɳa]	f.	/picarpa-in̪t̪a-ø/ /ɳa-a/ 'dugong-fOBL-T' 'now-T' → [(pí ca) pan̪ t̪a] ɳaa → [(pí ca) (pàn̪ t̪a) ɳaː]
e.	/kuri-c-ɲara-ki-a/ /ɳa-a/ 'see-TH-fAPPR-fLOC-T' 'now-T' → [(kú ri) ɳa ra ja] ɳaa → [(kú ri) (ɳà ra) (jà ɳa)]	f.	/kamar-wari-a/ /ɳa-a/ 'stone-fPRIV-T' 'now-T' → [(ká mar) (wà ri) a] ɳaa → [(ká mar) (wà ri) (à ɳa)]

The analysis of /ɳa/ encliticisation will be as follows.

Firstly, /ɳa/ is not a 'grammatical word' for the purposes of any of the prosodic constraints introduced in this chapter. Nor is /ɳa/ a root. This means that in the lexical prosodic phonology /ɳa/ is left unparsed, and devoid of foot and prosodic word structure:

(5.92)

	/ɳa-a/ 'now-T'	FtBin	L-Anch (GrWd,ω)	R-Align (ω,GrWd)	L-Anch (Rt,Σ)	R-Anch (nRt,Σ)	R-Anch (nRt,σ̆)	R-Align (Σ,GrW)	*Σ
☞ a.	ɳa a [(ɳá a)]	W_1		W_1				W_1	W_1

To capture the prosodification of /ɳa/ in the post-lexical phonology, the undominated constraint Faith-ω from earlier will be replaced with the partial ranking || Nonrecursivity, L-Anchor-IO(ω) » R-Align(ω,β) ||, to give the overall constraint ranking shown in (5.93). Nonrecursivity is the same constraint as used in the lexical phonology, and bars recursive embedding of any layer of prosodic structure. The two new constraints are defined in (5.94)–(5.95).

(5.93) Post-lexical prosodic constraint ranking

Undominated:
{ *Lapse, Nonrecursivity, L-Anchor-IO(ω)}

FtBin　　　R-Align(ω,β)

Faith-Σ

L-Align(Σ,GrWd)

(5.94) L-Anchor-IO(ω)
The leftmost syllable of an input prosodic word corresponds to the leftmost syllable of an output prosodic word.

(5.95) R-Align(ω,β)
The right edge of every prosodic word aligns with the right edge of a breath group. One violation is incurred for every syllable of distance between the two edges.

Example tableaux are shown in (5.96) and (5.97). Undominated L-ANCHOR-IO(ω) ensures that the left-hand edges of prosodic words survive undisturbed and unmoved, from the lexical representation into the post-lexical representation — cf losing candidates (5.96c) and (5.97a,b). Meanwhile, the ranking || NONRECURSIVITY » R-ALIGN(ω,β) || causes all right edges of prosodic words to be pulled rightwards, but bars the stacking of those words, such as in structures like [...[...[...]]], as found in loser (5.96a). The result is that prosodic words will expand rightwards so as to incorporate neighbouring enclitics such as /ɳa/, but otherwise remain in the same place as in the input.

(5.96)

| ... | = breath group: | [(ʈán ki) a] ɳa a [(mú t̪a) a] | 'here-fLOC-T now-T much-T' i.e., 'There's a lot here now.'	NONRECURS.	L-ANCH-IO(ω)	*LAPSE	R-ALIGN(ω,β)	FTBIN	FAITH-Σ	L-ALIGN (Σ,GrWd)
☞ | [(ʈán ki) (à ɳa)] [(mú t̪aː)] |				2			2
a. | [(ʈán ki) (à ɳa) [(mú t̪aː)]] |	W_1			L			2
b. | [(ʈán ki) a] ɳa [(mú t̪aː)] |			W_1	W_3			L
c. | [(ʈán ki) (à ɳa) (mù t̪aː)] |		W_1		L			W_{2+4}

(5.97)

| ... | = breath group: | [(ɻa a)] ɳa a [(ka ku) cu (nà a)] | 'south-T now-T uncle-fLOC-fABL-T' i.e., 'Uncle's is in the south now.'	NONRECURS.	L-ANCH-IO(ω)	*LAPSE	R-ALIGN(ω,β)	FTBIN	FAITH-Σ	L-ALIGN (Σ,GrWd)
☞ | [(ɻáː ɳa)] [(ká ku) (cù na)] |				4		1	2
a. | [(ɻáː ɳa) (kà ku)] [(cú na)] |		W_1		L_2		1	2
b. | [(ɻáː) (ɳá ka) ku] [(cú na)] |		W_1		L_2	W_1	1	L_1
c. | [(ɻáː)] ɳa [(ká ku) (cù na)] |				W_5	W_1	1	2
d. | [(ɻáː) ɳa] [(ká ku) (cù na)] |				4	W_1	1	2

5.3.9 Review: the interactions of stress, segmental phonology, and morphology

In Ch.4, it was argued that the segmental phonology of Kayardild is often sensitive to morphological structure and specifically, to stratal diacritics and to the difference between roots and suffixes. A question which was not directly raised in that chapter, was whether some of this apparently morphological sensitivity might be reduced instead to a sensitivity to prosodic structure. The tacit assumption in Ch.4 was that this is not be the case, and this section confirms that assumption to be correct.

Conceivably, if the morphological information which was vital to the phonology in Ch.4 were reducible in some way an aspect of prosodic structure, that reduction might be made in terms of surface prosodic structure, or in terms of underlying prosodic structure. Neither is the case, though. With respect to surface structure, we saw above that individual morphs surface with different stress patterns in different contexts, yet these patterns of surface prosody neither depend upon, nor trigger, different kinds of segmental phonology. With respect to underlying structure, it is true that there exists a certain correlation between stratal diacritics and underlying stress, but nothing systematic enough to enable one to be predicted from the other. Suffixes which undergo modifcations from the ‘regular’ phonology are overwhelmingly stressed underlyingly on their initial syllable, but nevertheless there are some that are not: fDAT /màɻù-t̪/ is stressed on both syllables for example, and the genitive ligative (fGENLIG) /pa/ is unstressed.[20]

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[20] On an alternative analysis, fGENLIG /pa/ is not an independent morph of its own but part of an allomorph of the formal genitive (fGEN), in which case that fGEN allomorph, /pakàraɲ/, which undergoes regular phonology, is stressed on its second syllable.

Likewise, suffixes which undergo modifications from the 'deleting' and the 'leniting' phonology comprise the bulk of suffixes which are underlyingly unstressed, yet several such as the formal proprietive (fPROP) $_D$/kùu/, $_D$/kùɻu/, formal plural (fPL) $_L$/pàlaṱ/ and formal possessive (fPOSS) $_L$/pàɲ/, do carry an underlyingly stress.

In sum, the morphological information identified in Ch.4 as being required by the segmental phonology, and the underlying and surface prosodic structures of Kayardild cannot be derived from one another, in either direction.

5.3.10 Regarding an alternative, monostratal analysis of stress

In the analysis of Kayardild stress above, a key architectural feature is the division between a lexical and a post-lexical stratum of prosodic phonology. The division is motivated by the fact that feet are preferentially built to the right in the lexical phonology but to the left in the post-lexical phonology. Here I outline an alternative, monostratal analysis based on an approach found elsewhere in the OT literature, followed by reasons for rejecting it.

It will be possible to analyse Kayardild stress in constraint based terms and within a single phonological stratum if some way can be found to make the phonology sensitive to the reason why a foot has been constructed, whenever it expresses a preference for that foot to be built to the right or to the left. The technical difficulty in achieving this relates to the fact that the constraints R-ALIGN and L-ALIGN which express those preferences operate entirely in terms of surface forms, and at the surface there is (currently) no difference between a foot which is built on the basis of underlying stress and a foot which is put in place for purely phonological reasons (i.e., to satisfy *LAPSE).

A workable approach will be to represent underlying stress as something other than foot structure. Taking the lead from analyses by Kager (1997) of the Australian languages Diyari, Dyirbal and Warlpiri, let us suppose that morphologically sensitive foot structure in Kayardild results from the association of suffixes not with foot structure but with *prosodic word* structure. An outline of the analysis would run as follows. First let us relabel everything termed a prosodic word in §§5.3.1–5.3.8 as a prosodic *phrase*. Now, rather than stressed suffixes being associated underlyingly with the head of a foot, let us associate them with the right edge of a prosodic word, floating at one syllable's remove from the stressed syllable. A high-ranking constraint R-ALIGN(ω,Σ) then demands that every prosodic word be right-aligned with a foot. The result at this point is as shown in (5.98):

(5.98)

	Underlying representation		Surface
Analysis in §§5.3.1–5.3.8	/-wàri/	→	(wà ri)
	/-ɻù-t̪/	→	(ɻù t̪…)
Alternative	/-wari]/	→	(wà ri)]
	/-ɻu-t̪_]/	→	(ɻù t̪…)]

When a potential stress clash arises, we will let it be resolved by allowing only some of these prosodic word boundaries to surface,[21] and use a low-ranked R-ALIGN(ω,GrWd) constraint on prosodic words to favour them surfacing to the right, with the result as shown in (5.99a) below. In addition, we posit an even lower-ranked L-ALIGN(Σ,ω)

[21] That is, rank FTBIN » MAX-ω.

constraint on feet, which pulls feet to the left, but only *within* prosodic words. This ensures that the first foot in (5.99b) for example is shifted as far as possible to the left, without changing the result in (5.99a), that stress clash is resolved to the right.

(5.99)

	Underlying representation		Surface
a.	/...-ɻu-t̻_]-wari] .../	→	...-ɻu (t̻à ri)] ...
			not * ...-(ɻù t̻a)][ri ...
b.	/...ki-ɻiŋ-ki-naa]-n̻ta .../	→	...(kì ɻiŋ) ki (nà an̻)] t̻a ...
			not * ...ki (ɻìŋ ki) (nà an̻)] t̻a ..

Supposing, as seems to be the case, that this solution is technically feasible, why reject it? The solution just sketched relies crucially on prosodic word structure to achieve its ends, but that structure has no interpretation in terms of prosodic *prominence*, only in terms of its secondary effect on the placement of feet. As it currently stands, the solution will generate level 1 and level 2 stresses, all of which correspond to the level 1 stresses of §§5.3.1–5.3.8. To square the new solution with the fact that there is no observable difference between the stress levels 1 and 2 which it produces, we need to adopt either (i) an interpretation of the 'prosodic word' as a purely organisational category with no bearing on prominence, or (ii) a process which collapses stress levels 1 and 2 after they have been put in place. Option (i) entails a theoretically non-trivial move — the re-introduction into prosodic theory of representations with a purely rhythmic function, devoid of any correlation with prominence (much like the early rhythmic grids of Liberman & Prince 1977); option (ii) reintroduces a second stratum into the analysis, and so fails to achieve its main purpose, which was to reduce the analysis of Kayardild stress to a single stratum.

In conclusion then, in the absence of any compelling argument for re-adopting the theoretical division between rhythm and prosodic prominence, the multistratal analysis of Kayardild stress presented in §§5.3.1–5.3.8 is preferable to the monostratal alternative outlined here.

5.4 An overview of Kayardild intonation

We move now from stress to intonation, which will be the topic for the remainder of the chapter. Since little is currently known about the connection between intonational form and intonational meaning in Kayardild, the discussion deals almost exclusively with matters of form. An empirical overview is presented in §5.4, an introduction to the autosegmental metrical framework of intonational analysis in §5.5, and a formal analysis of Kayardild intonation in §5.6.[22]

We begin with an introduction to the major features of the Kayardild intonation system. This section describes in detail how intonation contours may be decomposed into smaller pitch movements, each selected from a limited set of possibilities. The description begins with global pitch movements in §5.4.1, moving to smaller scale pitch movements in §5.4.2; §5.4.3 focuses on intonational prominence, and §5.4.4 examines very short stretches of flat pitch whose presence or absence is a central point of fine-scale

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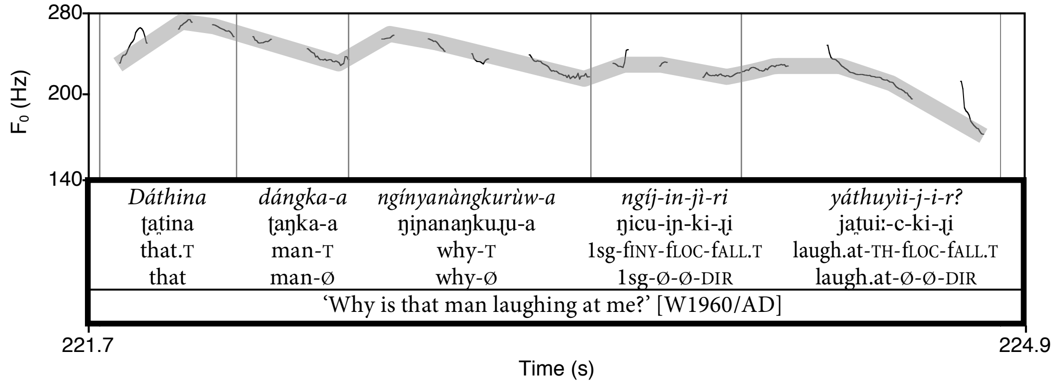
[22] The analysis of intonation presented in this section builds upon research conducted in 2001–2002 with Janet Fletcher (First-named Principal Investigator) and Nick Evans, within the Australian Research Council-funded project *Intonation and Prosody in Australian Aboriginal languages.*

intonational variation in Kayardild. Zooming out, §5.4.5 considers intonational structure above the level of the breath group and §5.4.6 examines pitch movements at breath group edges. A summary is provided in §5.4.7.

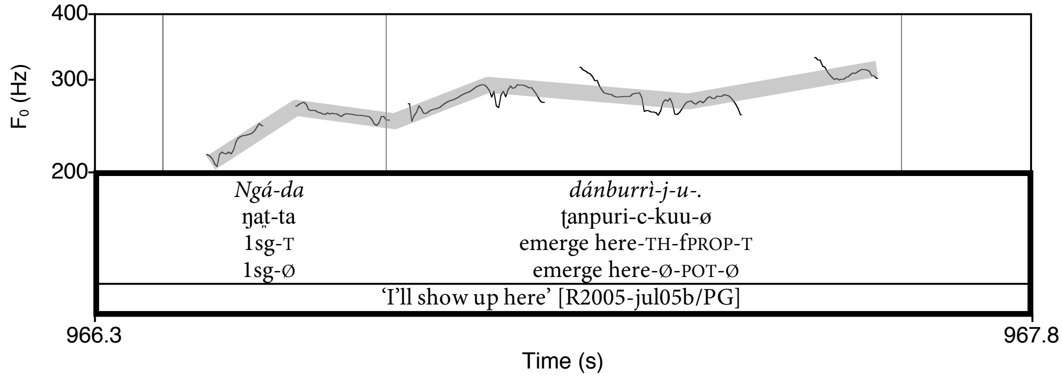
5.4.1 Global falls, rises and plateaux

One of the first notable features of Kayardild intonation that its inventory of tune types includes contours in which the pitch level undergoes a global fall, contours in which in it undergoes a global rise, and contours in which it is basically flat (referred to as **plateaux**). These three kinds are illustrated in (5.100)–(5.102). Diagrams such as (5.100)–(5.102) will be used throughout this section. They each contain one or more glossed Kayardild phrases, whose words are aligned with a plot against time of the pitch at which they were uttered. Pitch, or more precisely fundamental frequency (F_0), has been calculated using Praat (Boersma & Weenink 2008), and is indicated in the top window of each diagram by a thin black line. Technically speaking, F_0 is undefined during periods of unvoiced speech, hence the pitch track will contain gaps that correspond to voiceless stops; it can also be undefined in periods of aperiodic or weakly periodic phonation, as during the creak which is commonly encountered just before a pause. Furthermore, pitch tracks regularly record sharp or sudden pitch changes which are not consciously perceived, but which result from rapid changes in vocal tract geometry, especially from changes of the type which occur at the boundaries between vowels and consonants. In order to abstract away from these non-essential phenomena, the pitch tracks in these diagrams will be complemented by a thicker, grey line which provides an interpretation of what is consciously heard (based on my own judgements).

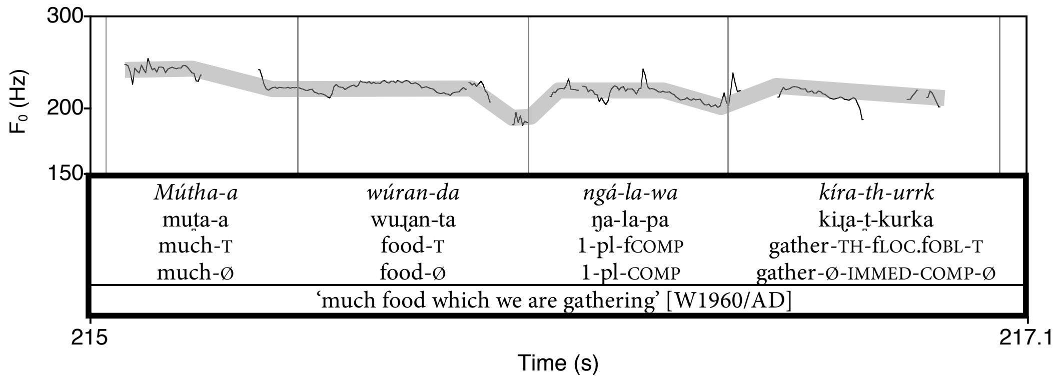
(5.100) A globally falling contour



(5.101) A globally rising contour



(5.102) A globally flat, 'plateau' contour



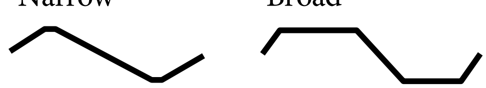
5.4.2 Pitch movements across 'stress feet'

Moving beyond global pitch movements to a finer-grained level of description, the intonation contours of Kayardild can usefully be viewed as being composed of a string of units each stretching from one stressed syllable to the next. In and around these smaller domains, local pitch movements conform to one of only a small number of types, which will be enumerated in this section and the next. For expository purposes, these domains will be referred to as **stress feet** and the pitch movements associated with them as **stress foot contours**. In employing these units to flesh out a description of Kayardild intonation contours though, the intention is not to imply that they have any particular theoretical status, nor that a formal analysis of Kayardild intonation will necessarily refer to them. In fact, the analysis in §5.6 does not refer to them.

The current section surveys stress foot contours associated with low levels of intonational prominence (higher levels of prominence are examined in §5.4.3), taking plateau phrases, falls, and rises in turn.

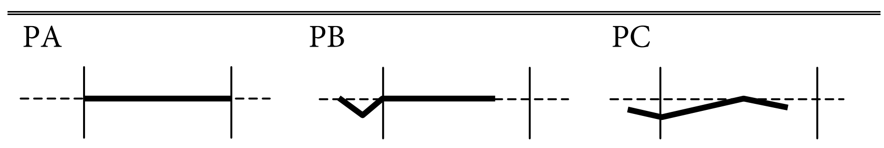
For the time being, discussion (and labelling of examples) will abstract away from: (i) rises at the very left edge of breath groups which lead into plateaux (these will be covered in §5.4.6); (ii) rises and falls at the very right edge of breath groups (these will be covered in §5.4.6) and (iii) the contrast, sketched schematically in (5.103), between ‘narrow’ pitch maxima and minima, and ‘broad’ pitch peaks and troughs (this distinction will be covered in §5.4.4).

(5.103) ‘Narrow’ ‘Broad’



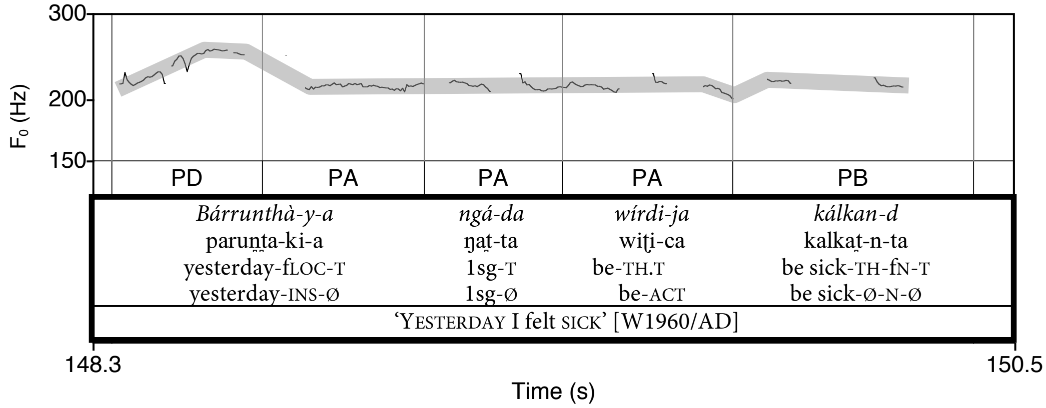
With these caveats in mind, we begin with plateau stress foot contours. In plateaux, there are three types of stress foot contour associated with low levels of intonational prominence, which will be labelled PA, PB and PC (on prominence-lending PD see §5.4.3 below). The simplest stress foot contour in plateaux is PA, which consists of a flat continuation of pitch across the stress foot. Any variation in pitch which occurs in a PA contour can be attributed to changing vocal tract geometry rather than any linguistically significant, deliberate pitch manipulation. Stress foot contour PB is like PA only that it is preceded by a shallow dip in pitch at the end of the preceding stress foot. Stress foot contour PC is also preceded by a dip, but in a PC contour the rise out of the dip begins, rather than ends, at the left edge of the stress foot. The three stress foot contours PA, PB and PC are sketched schematically in (5.104), and actual examples follow.

(5.104)



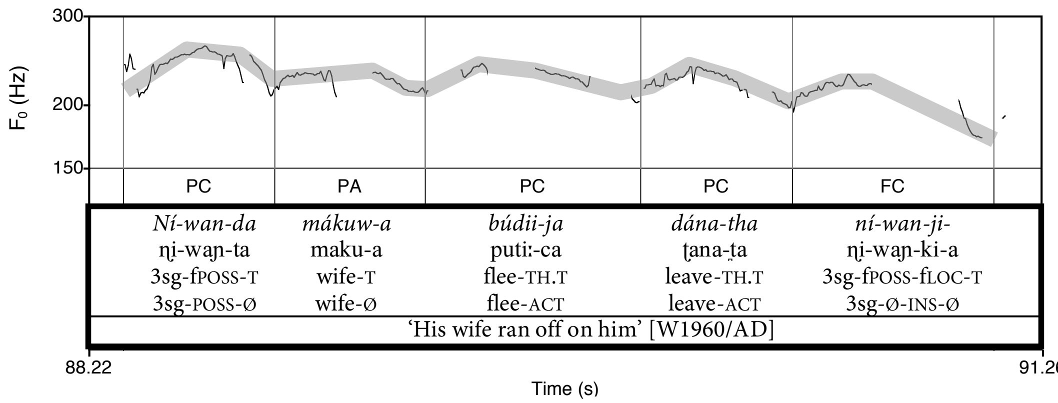
Example (5.105) shows a phrase containing PA and PB stress foot contours. As in many of the examples to follow, the transcription in (5.105) incorporates an extra (uppermost) line in which stress feet are demarcated and their corresponding contours are labelled.

(5.105) Phrase illustrating PA and PB contours [23]



Stress foot contour PC can be seen in (5.106) — a sequence of PC stress foot contours creates a pitch track that undulates within a narrow range.

(5.106) Phrase illustrating PC contours

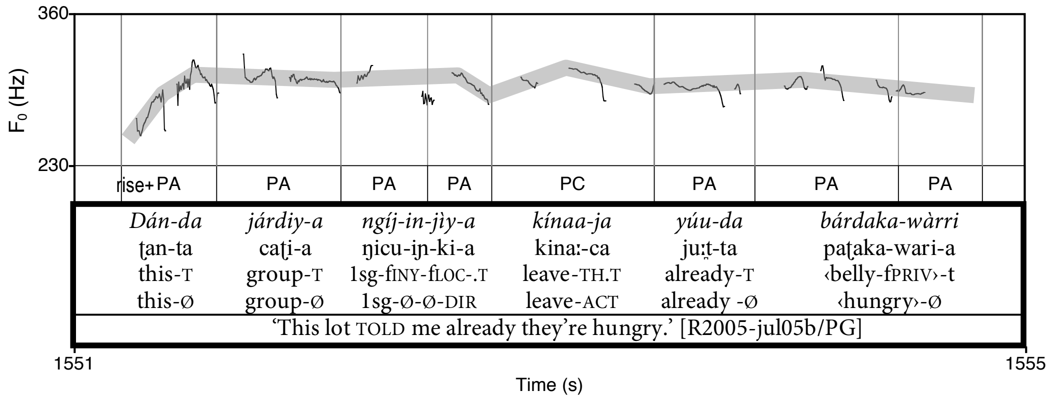


Both the PB and PC contours have a somewhat higher prominence than neighbouring PA contours. This can be seen in (5.105) above and (5.107) below: relatively high

[23] Example (5.105) is followed by example (5.134) below, 'Now I'm WELL, I'm NOT SICK'.

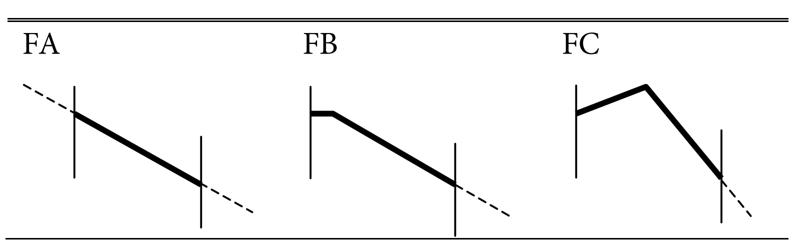
intonational prominence of a Kayardild word is indicated in the lowest transcription tier, where the corresponding English word is capitalised.

(5.107) Higher prominence of PC relative to neighbouring PA



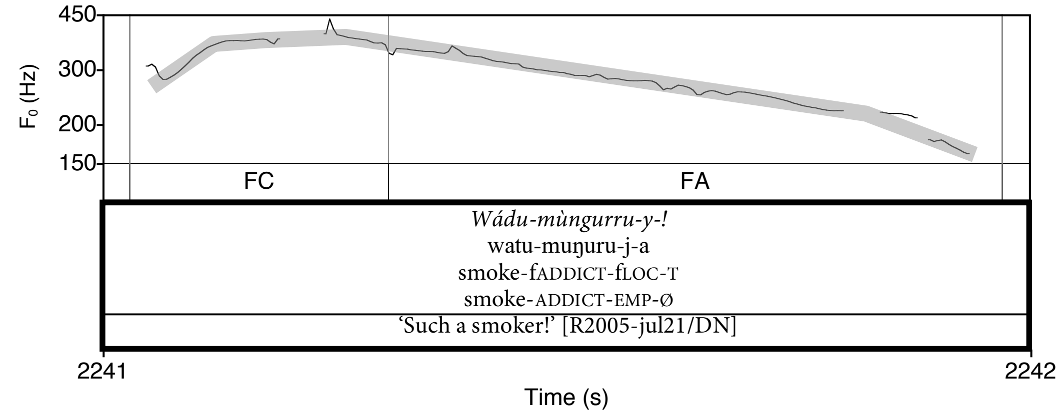
Turning to falling contours, once again there are three stress foot contour types, which will be labelled FA, FB and FC. The simplest falling stress foot contour is FA, in which pitch merely falls across the stress foot with no deviation in the rate of pitch declination. In FB, the pitch fall is briefly arrested at the left edge of the stress foot, producing a small 'terrace' before the decline in pitch resumes. In FC, there is a rise from the left edge of the stress foot followed by a fall which typically begins either late in the first syllable or during the second syllable of the stress foot. The stress foot contours FA, FB and FC are sketched schematically in (5.108).

(5.108)

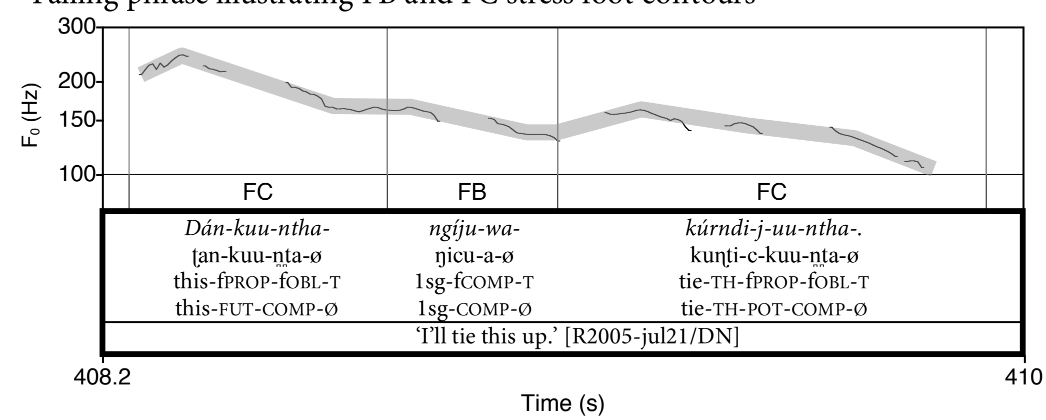


The FA stress foot contour is illustrated in (5.109), FB in (5.110) and FC can be seen in (5.109) and (5.110).

(5.109) Falling phrase illustrating FA and FC stress foot contours

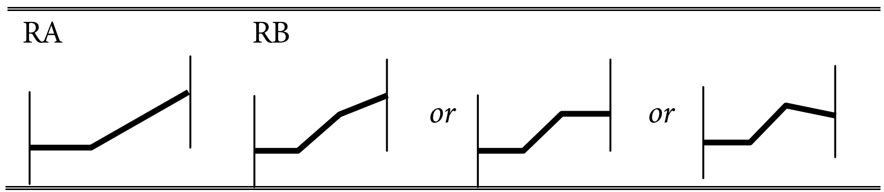


(5.110) Falling phrase illustrating FB and FC stress foot contours



There are only two types of rising stress foot contour, which will be labelled RA and RB. In both the RA and RB contours, pitch first follows a relatively flat course before starting to rise during the first syllable of the stress foot — typically this rise begins towards the end of the syllable, though occasionally it begins earlier. In RA the rise simply continues to the end of the stress foot. In RB, the rise continues some distance and then the rate of pitch inclination drops; in many cases pitch will even plateau or begin to fall slightly. The point at which pitch inclination changes is quite variable. The stress foot contours RA and RB are sketched schematically in (5.111).

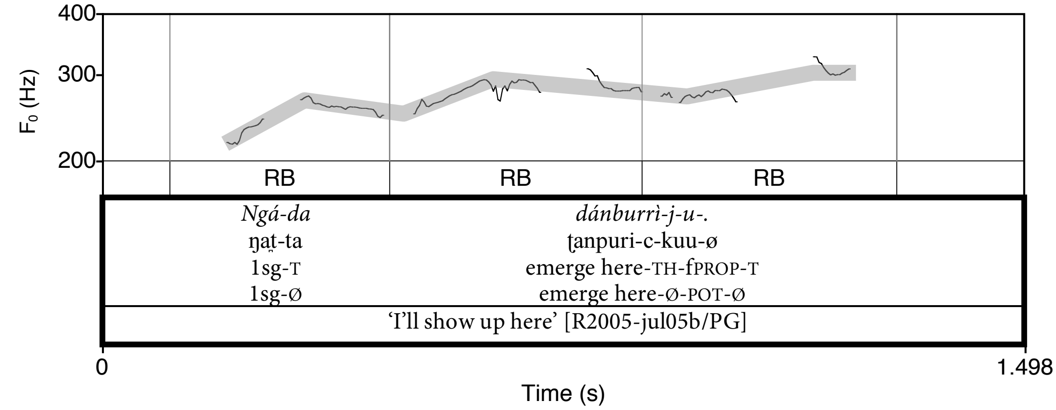
(5.111)



A clear example of an RA contour example occurs in (5.112). A rising phrase consisting solely of RB contours is (5.101), repeated here as (5.113).

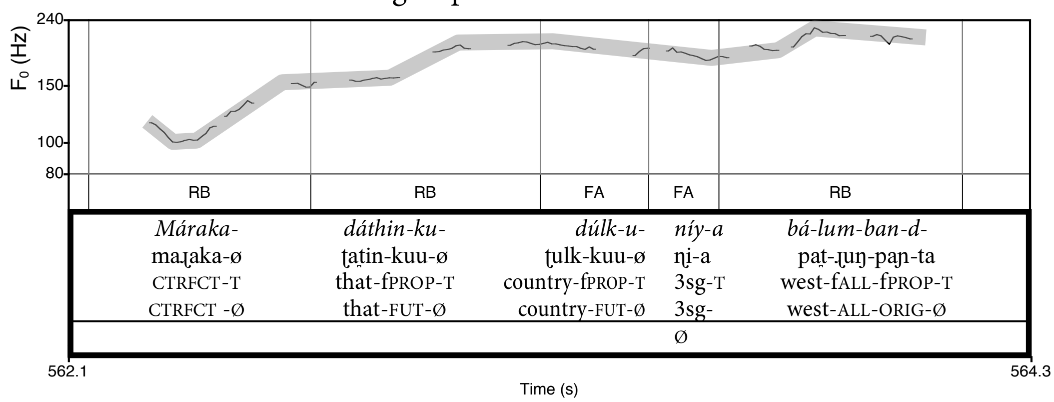
(5.112) Rising phrase comprised of with RA and RB stress foot contours

(5.113) Rising phrase comprised of three RB stress foot contours

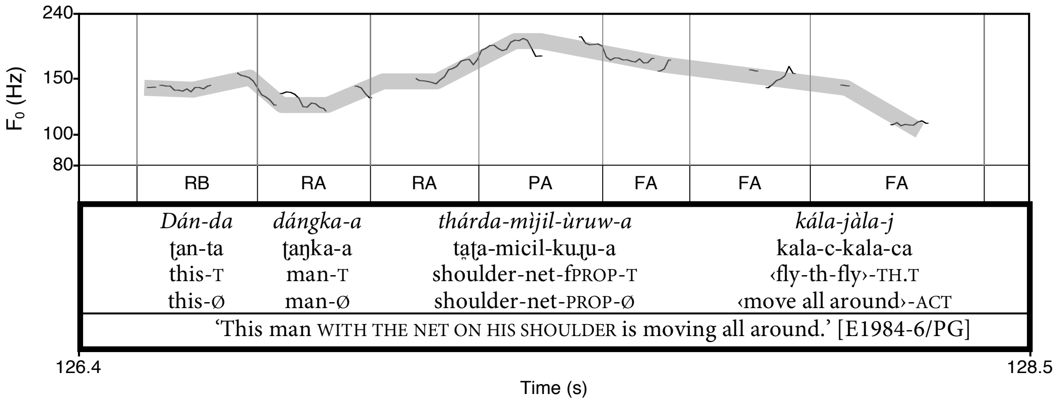


Examples (5.114) and (5.115) illustrate two additional characteristics of rising stress foot contours. First, at the left edge of a breath group, a rising stress foot contour will sometimes begins with a shallow fall in pitch, as occurs in (5.114). Second, in cases where several rising stress foot contours follow one another, the earliest of them can be followed by a quick lowering of pitch so that the next contour rises over essentially the same pitch range — this allows each stress foot to be associated with a rise, but without quickly exhausting the speaker's pitch range. This lowering occurs between the first and second rising stress foot contour in (5.115).

(5.114) Short fall at start of a breath group initial RB stress foot contour[24]



(5.115) Quick drop in pitch between rising stress foot contours



5.4.3 Prominence-lending intonation

The preceding section introduced the full set of low-prominence stress foot contours. This section covers intonational forms which lend a relatively high level of prominence to

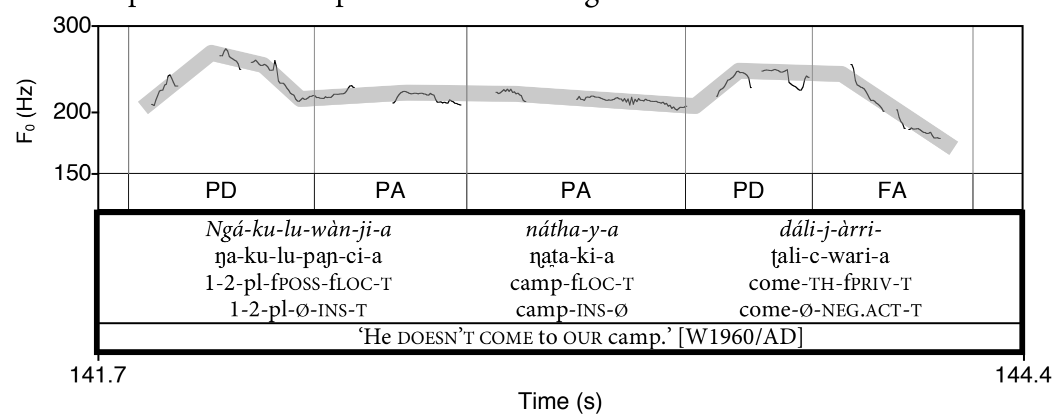
[24] Rising contours such as this prompted the hypothesis in Fletcher et al. (2002) that the particle /maɽaka/ in its counterfactual (CTRFCT) usage combines with 'a low tone on the particle and a high tone, which goes onto the in-focus element' (p.298). However, compare this with falling and plateau examples (5.119) and (5.120) — it seems that counterfactual /maɽaka/ simply occupies a non-prominent position in any contour type, while the 'in-focus' element is marked as prominent by normal means (cf. §5.4.3).

stress feet (and thence, to words whose leftmost, level 2 stressed syllables fall within those stress feet). As far as I can ascertain, there are no restrictions — phonological or morphosyntactic — on which words can receive these kinds of prominence.

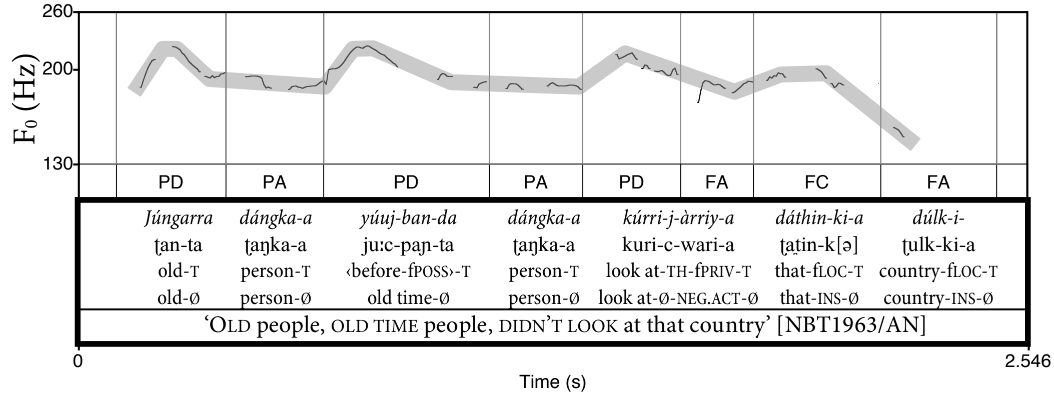
Different strategies are used in association with plateaux, falls and rises, and these will be examined below in turn. In the case of plateaux, prominence is marked by a stress foot contour which contrasts paradigmatically with PA, PB and PC, and which will be labelled PD. In the case of rises and falls, prominence is interpreted from syntagmatic information: in a continuous sequence of rising stress foot contours, the final stress foot in the sequence is prominent, while for falls, prominence is signalled by an FC rise–fall contour whose rise comes to peak at least as high as the level at which the previous fall began.

The PD stress foot contour consists of a rise–fall pattern which extends above the pitch level of the surrounding plateau. A phrase featuring one PD stress foot contour is (5.105) above. Examples (5.116) and (5.117) contain two and three PD stress foot contours respectively.

(5.116) Plateau phrase with two prominence-lending PD stress foot contours



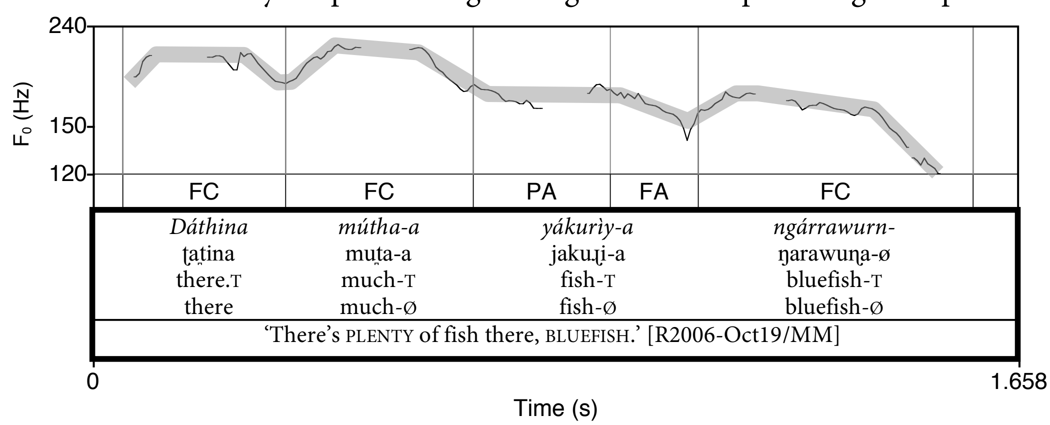
(5.117) Plateau phrase with three PD stress foot contours



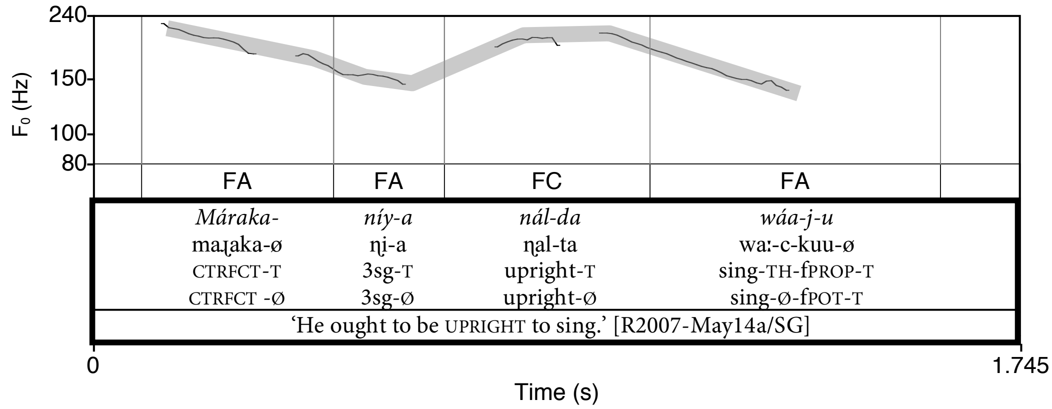
For rising contours, special prominence is lent to a word whose leftmost, level 2 stressed syllable falls under the rightmost of an uninterrupted series of rising stress foot contours. This can be seen in each of the examples (5.112)–(5.115) above.

In falling phrases, special prominence is lent to a word whose leftmost, level 2 stressed syllable falls under an FC stress foot contour with a pitch peak at least as high as the level at which the previous fall began. Example (5.118) contains two such words; example (5.119) contains one.

(5.118) Prominence lent by FC peaks as high or higher than the preceding fall's peak

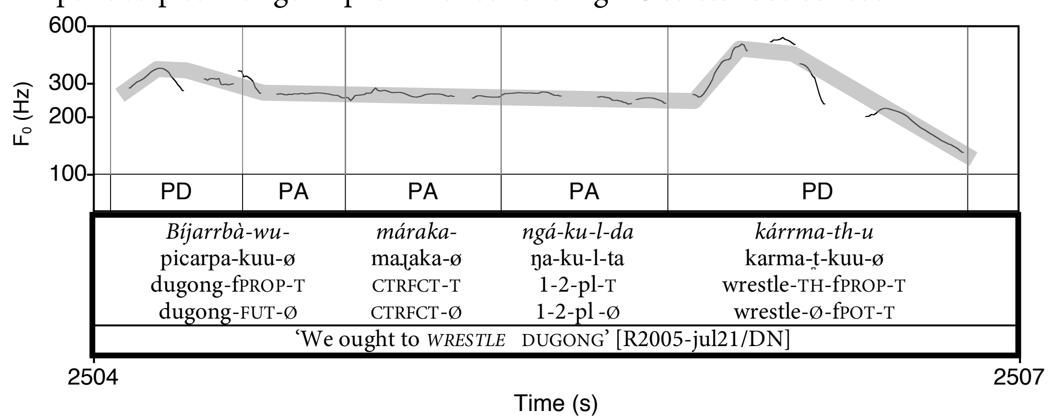


(5.119) Prominence lent by FC peak as high or higher than the preceding fall's peak

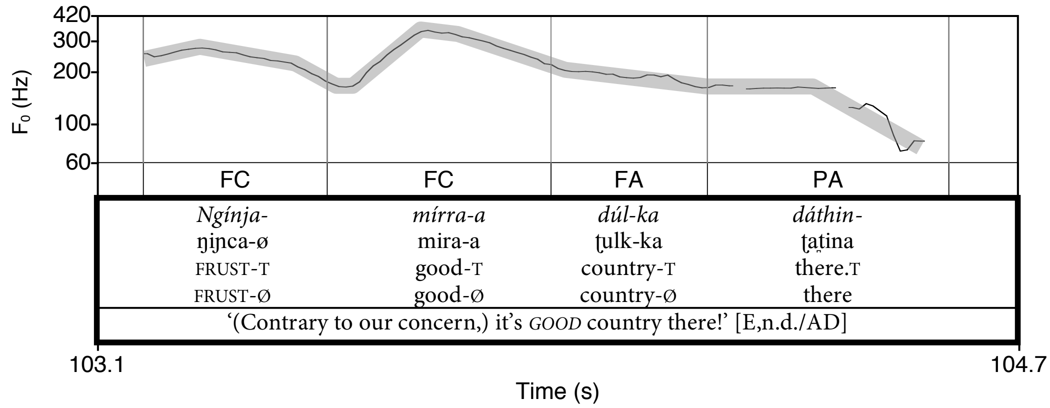


We have just met two kinds of prominence lending, rise–fall stress foot contours: the inherently prominent-lending PD contour and the FC contour used with a high pitch peak as in (5.118) and (5.119). Both of these rise–falls can be realised with a variety of pitch ranges, and extra emphasis can be added by increasing that range. Examples with especially large pitch ranges — exceeding one octave — are shown in (5.120) and (5.121).

(5.120) Expanded pitch range in prominence-lending FC stress foot contour



(5.121) Expanded pitch range in prominence-lending PD stress foot contour

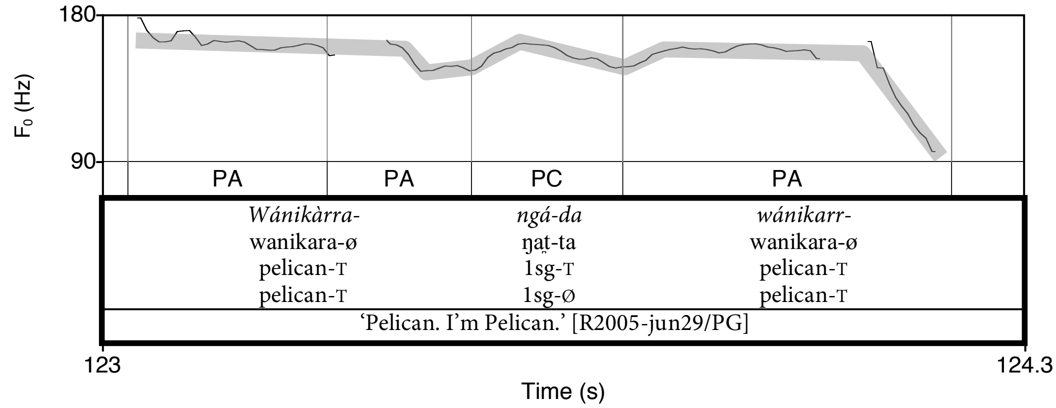


5.4.4 Micro-plateaux

There are two points of variation which recur across the stress foot contours of Kayardild, both having to do with the presence versus the absence of very short plateaux, which stretch no further than a syllable and often only as far as a single segment, and which can be termed **micro-plateaux**. The first kind of micro-plateau occurs immediately to the left of a stress foot, and will be referred to as a 'leading' micro-plateau. The second kind occurs at the peak of a rise–fall, and will be referred as a 'peak' micro-plateau.

Leading micro-plateaux occur in (5.110) above, leading into an FB stress foot contour, and cutting into the fall of the preceding FC contour; in (5.116) above, leading into a PA contour, cutting into the fall of the preceding PD contour; and in (5.122) the leading micro-plateau broadens the dip before a PC stress foot contour:

(5.122) Leading micro-plateau in the dip before a PC stress foot contour



Peak micro-plateaux appear in PC, PD and FC stress foot contours, and can be seen in (5.106, in the first stress foot), (5.134) and (5.118) respectively.

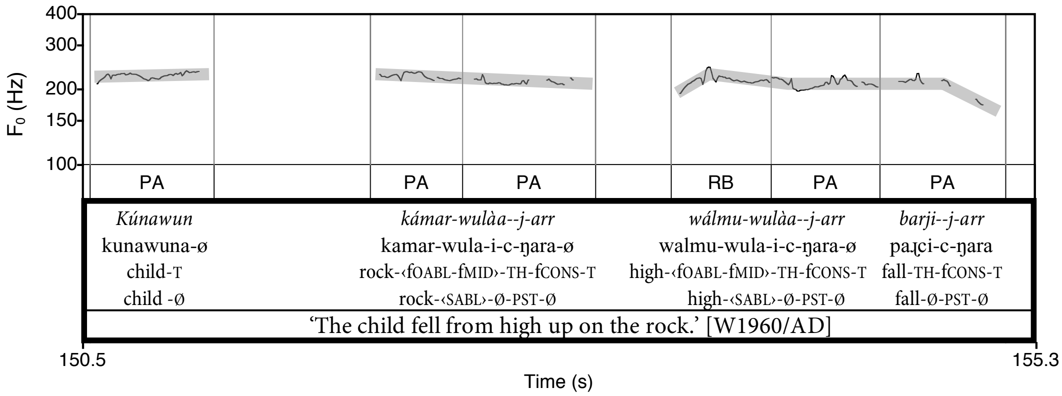
5.4.5 Intonational structure above the breath group

The organisation of intonation in Kayardild extends beyond the domain of individual breath groups. This higher level of structure is reflected in: (i) the syntagmatic arrangement of breath groups with particular individual intonational profiles; (ii) the height at which pitch begins at the left edge of one breath group relative to that of the preceding breath group; and (iii) pitch movements at the right edge of breath groups.

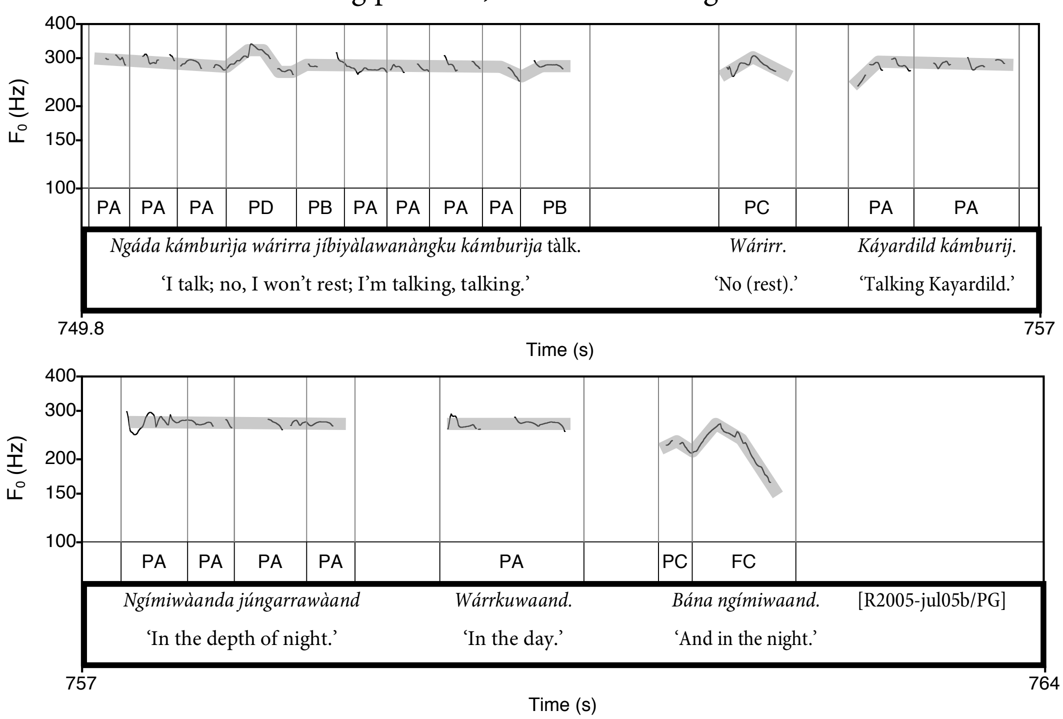
The right edge of a breath group is marked intonationally to indicate its relationship to a following breath group. A final plateau or rise indicates that it relates to the subsequent breath group within a cohesive string, while a final fall signals that a cohesive string of breath groups has been concluded (see §5.4.6 for a closer characterisation of the pitch movements involved). These 'cohesive strings' can extend over a sentence fragment, over a whole sentence or over a larger unit. Example (5.123) shows a sentence divided into three breath groups within a cohesive string. Example

(5.124) shows several sentences arranged together into a single, cohesive string. (The two pitch tracks of (5.124) follow on from one another.)

(5.123) A series of two continuing plateaux, and a concluding plateau.

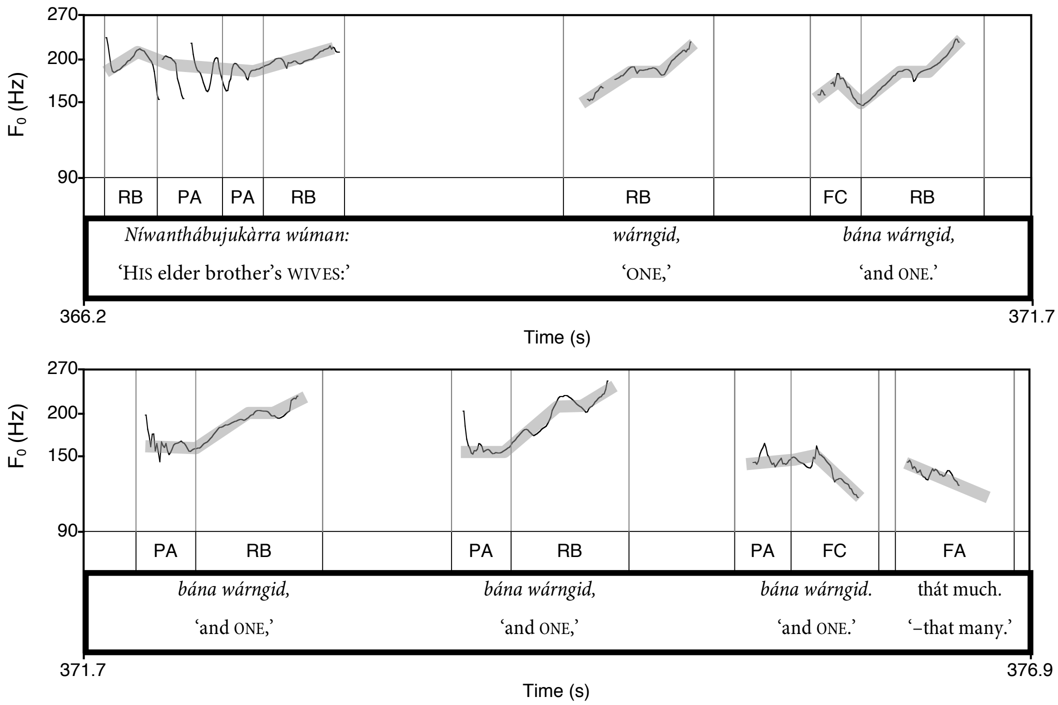


(5.124) A series of five continuing plateaux, and a concluding fall.

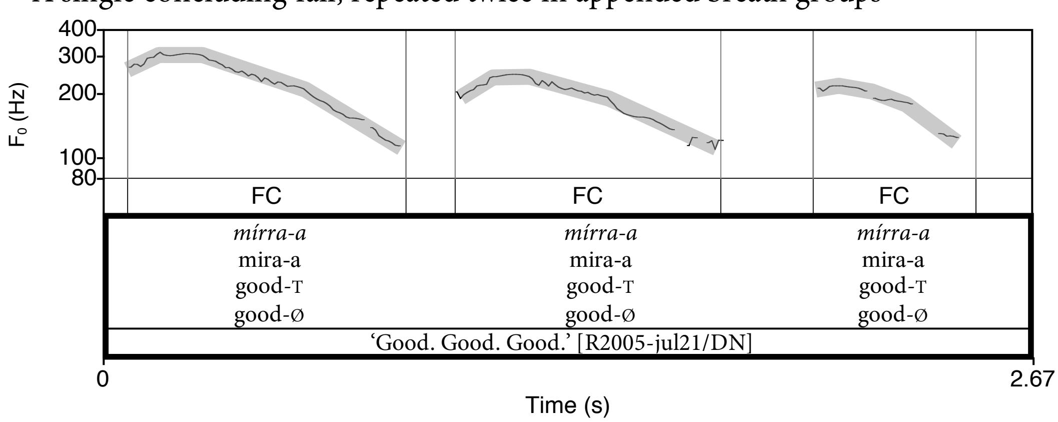


Although a concluding fall conventionally signals the end of cohesive string, a speaker will sometimes wish to add additional material in a post-hoc manner. This is done in what can be termed an ‘appended’ breath group — a breath group whose pitch onset is set at the same level or lower than that of the preceding breath group. Examples are shown in (5.125) and (5.126).

(5.125) A series of five rises, a concluding fall, then an appended fall; [R2005-jun29/PG]

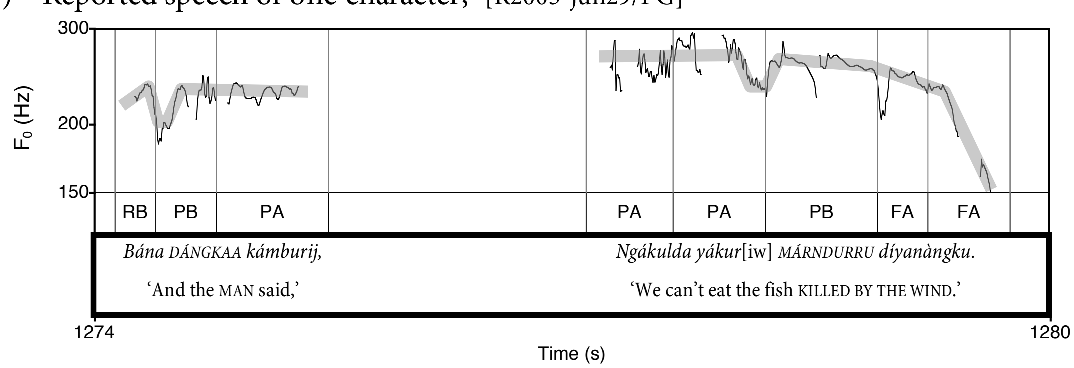


(5.126) A single concluding fall, repeated twice in appended breath groups

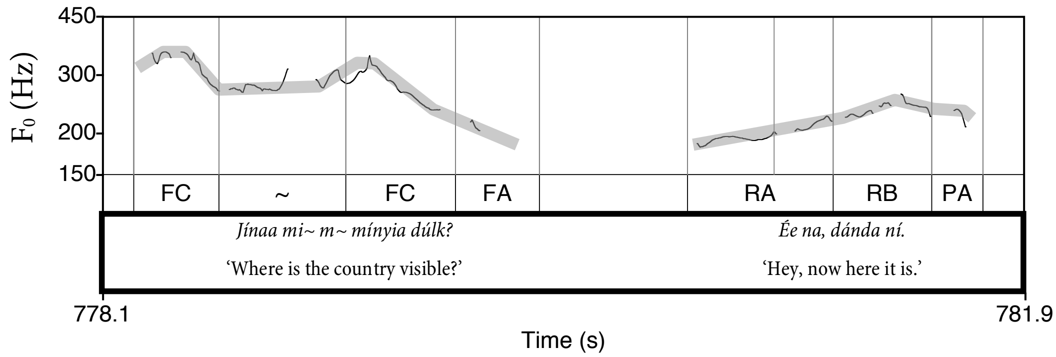


Intonation is a frequent marker in Kayardild of reported speech. Fletcher (2005: 215-23) studies a small corpus of reported speech and neighbouring text in Kayardild and another Australian language, Dalabon, and finds that relative to neighbouring text, reported speech is intoned with a wider pitch span (at statistically significant levels) and somewhat higher register in both languages. My own familiarity with reported speech, based on more extensive corpus, accords with Fletcher's findings. In (5.127) the speaker raises the overall pitch level of the second breath group in order to set off reported speech from the surrounding text. (The distortion in the pitch track at the start of the second breath group results from another marker of reported speech in Kayardild, that is, the use of a constricted voice quality in the opening few syllables.) In (5.128) the speaker evokes a dialogue by placing the reported speech of the first character at a high pitch and the reported speech of the second character at a lower pitch. This pattern, in which the reported speech of the first character is high, and of the second character (if present) is low, is well attested.

(5.127) Reported speech of one character; [R2005-jun29/PG]



(5.128) Reported speech of two characters; [R2005-jun29/PG]

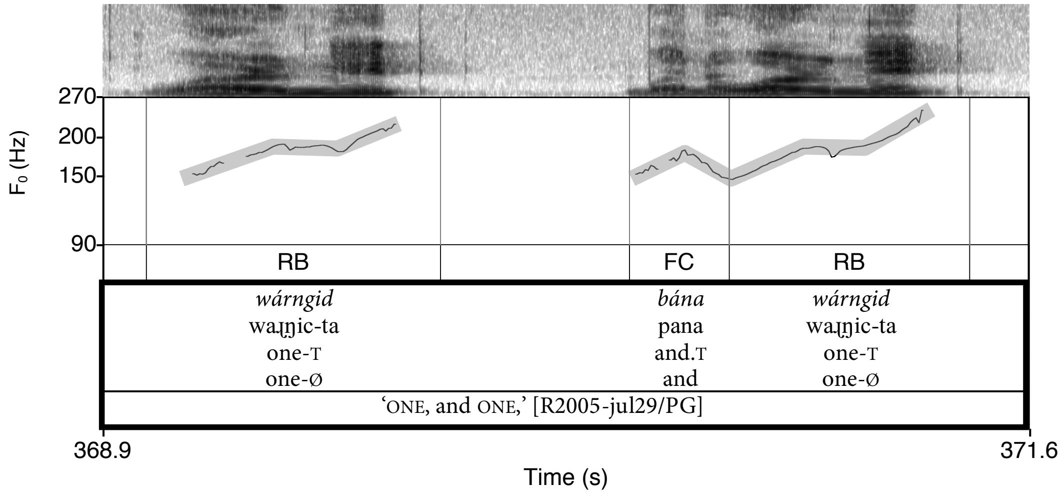


5.4.6 Pitch movements at the edges of breath groups

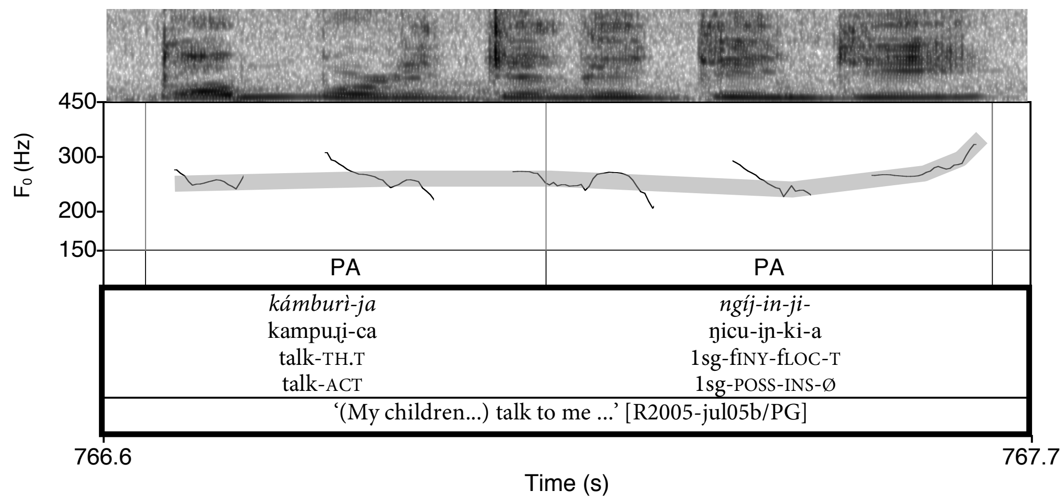
This section examines in turn the four kinds of pitch movements that occur at breath group edges: (i) right edge rises; (ii) right edge plateaux; (iii) right edge falls; and (iv) left edge rises into plateau phrases.

As stated in §5.4.5 above, rising pitch at the right edge of a breath group signals intonational cohesion with the following breath group. Examples of right edge rises are shown in (5.129)–(5.131), where they follow rising, plateau and falling stress foot contours respectively. Spectrograms (0–7000kHz) are aligned above the pitch tracks, in order to make apparent the relative position of the rise onset with respect segmental material: the right edge rise occurs in the last syllable of the breath group, extending over anything from the whole syllable, as seen in (5.129), through half of the syllable as in (5.131), to very little of the syllable, as in (5.130).

(5.129) Right edge rises after rising stress foot contours[25]

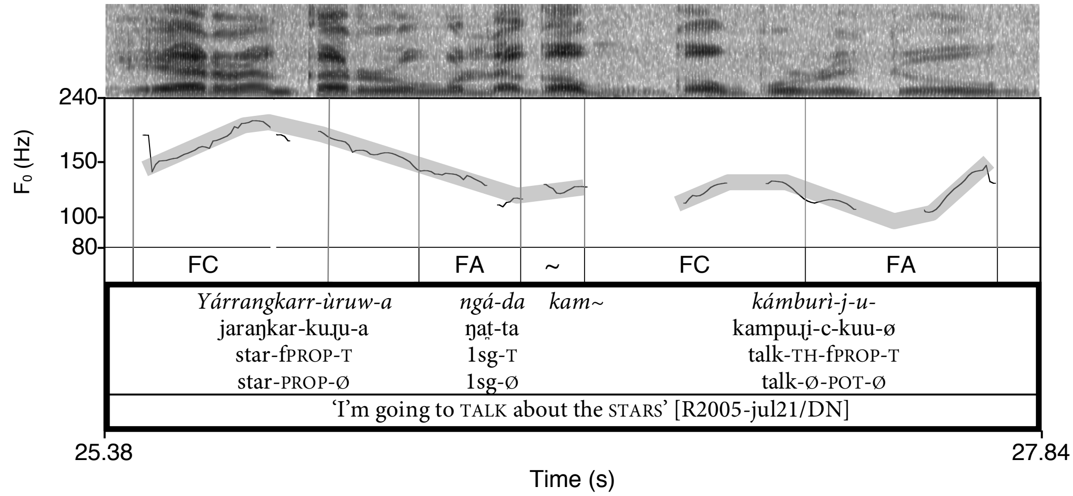


(5.130) Right edge rise after a plateau stress foot contour



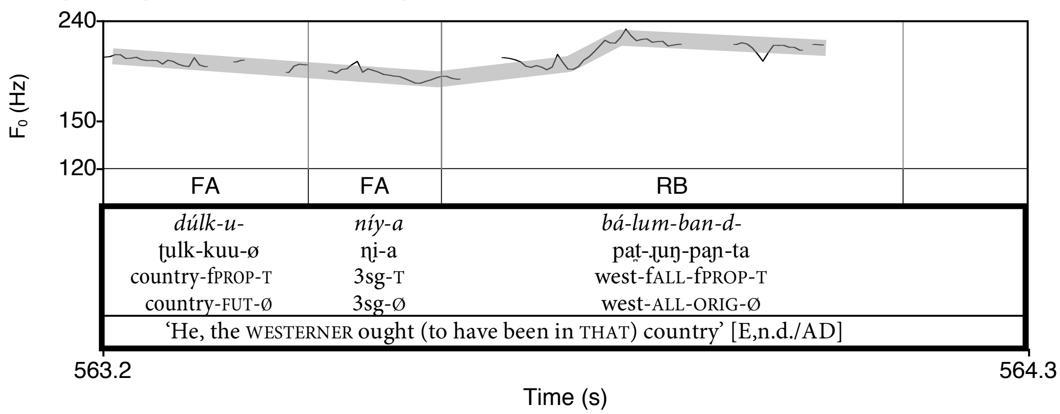
[25] Example (5.129) shows a magnified section of example (5.125) above.

(5.131) Right edge rise after a falling stress foot contour



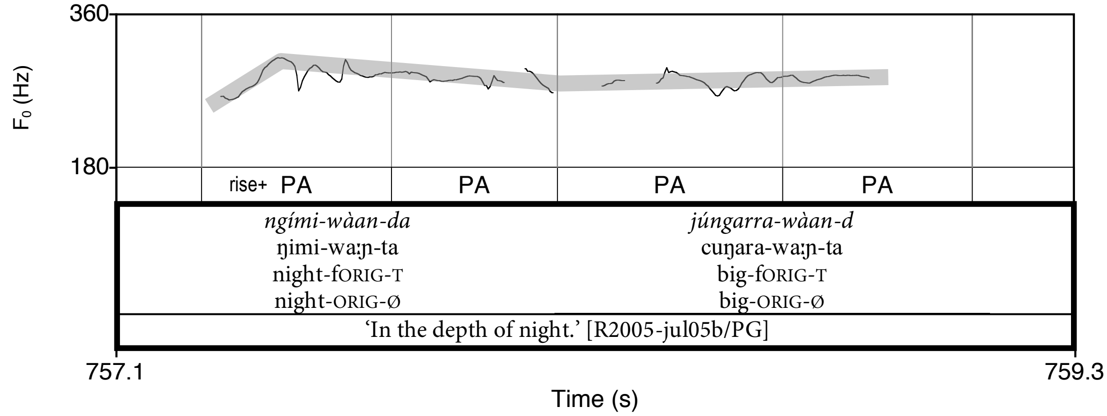
Plateaux at the right edge of breath groups are illustrated in (5.132) and (5.133), where they follow a rising and a plateau stress foot contour respectively. I have not observed a right edge plateau which unambiguously follows a falling stress foot contour, however in the second breath group of (5.134), a right edge plateau does occur at the end of a rise–fall PD stress foot contour.

(5.132) Right edge plateau after rising stress foot contour [26]

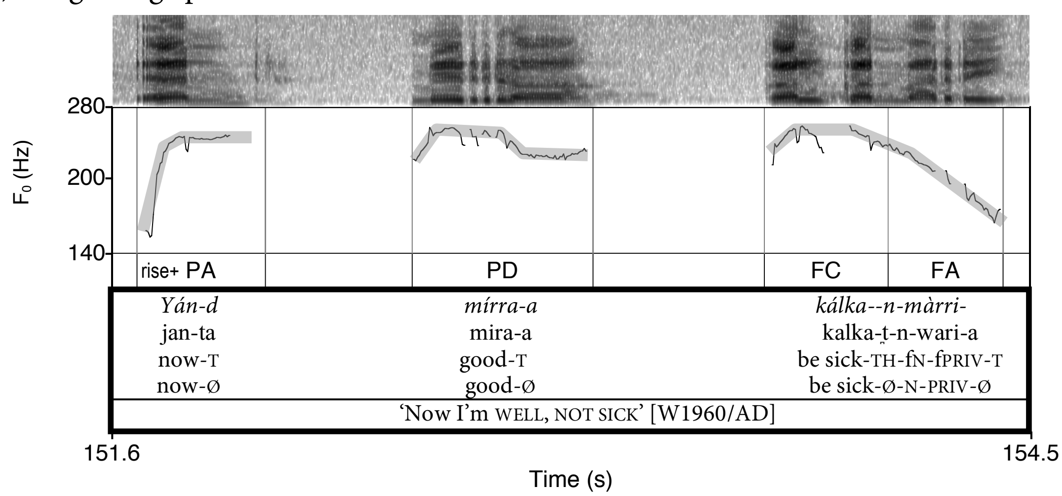


[26] Examples (5.132) and (5.133) show magnified sections of (5.114) and (5.124) above.

(5.133) Right edge plateau following on from plateau stress foot contour [26]



(5.134) Right edge plateau after a PD stress foot contour [27]



Right edge falls are found after plateau stress foot contours; I have not observed a right edge fall after a rising stress foot contour, and it is unclear whether right edge falls can be distinguished after falling stress foot contours. Like right edge rises, the extent of a right

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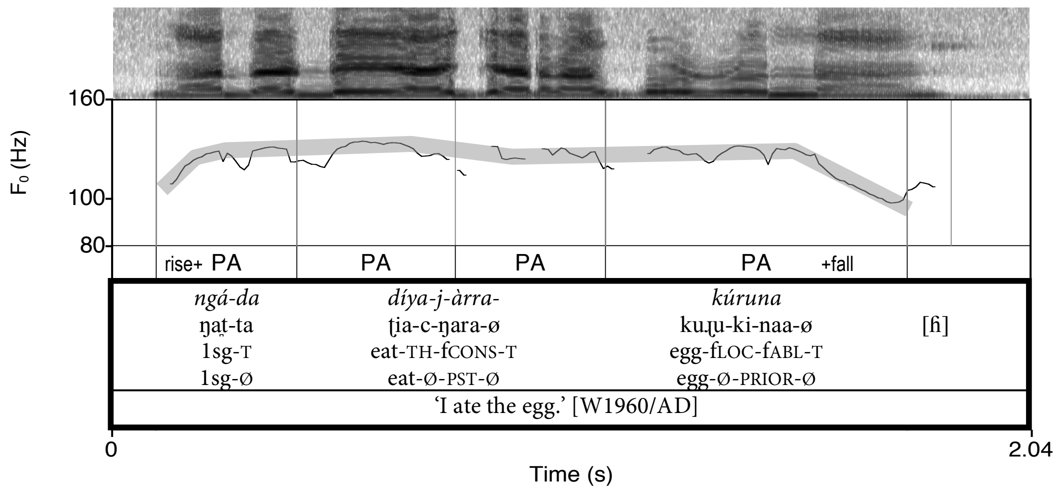
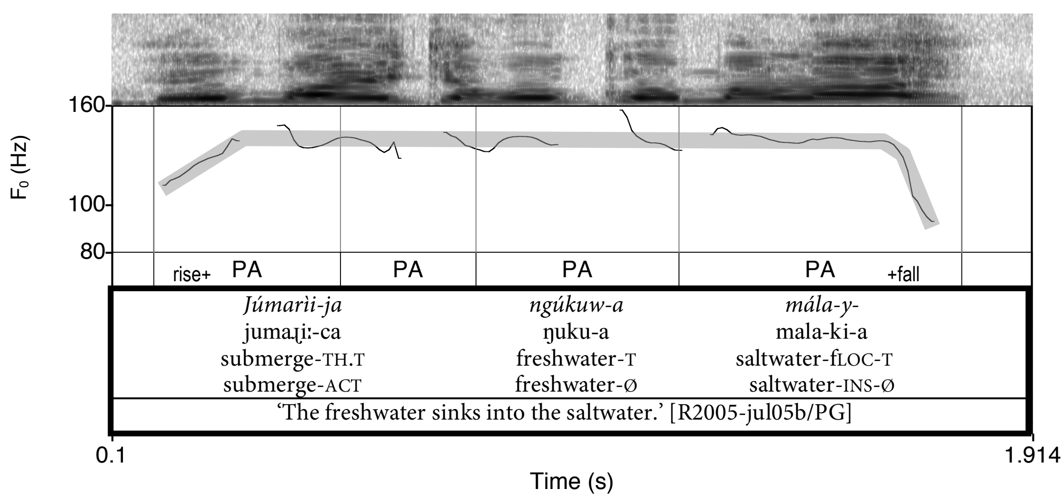
[27] Example (5.134) follows on from example (5.105) above.

edge fall is variable, ranging from the entire last syllable to only a small fraction of it. Examples which contrast in this respect are shown in (5.135) and (5.136).

(5.135) Early starting right edge fall



(5.136) Late starting right edge fall



Left edge rises occur at the beginning of many plateau phrases. Unlike right edge pitch movements, left edge rises play no role in signalling the cohesion of one breath group with another — in the strings of cohesive breath groups shown in §5.4.5 above, left edge rises occur in several non-initial breath groups in (5.124), as well as in the initial breath group in (5.125). Similar to right edge rises and falls, left edge rises exhibit considerable variation in their extent relative to segmental material, ranging from two whole syllables, through one, to just a fraction of a syllable, examples of which can be seen above in (5.136), (5.135) and (5.134) respectively.

5.4.7 A summary of key aspects of Kayardild intonational form

Before proceeding to a formal analysis, let us recap the key aspects of Kayardild intonation introduced in §§5.4.1–5.4.6.

Intonation contours can be decomposed into: (i) pitch movements found especially at breath group edges, (ii) units described above as 'stress foot contours', that is, segments of pitch movement which stretch from one stressed syllable to the next, sometimes encompassing also a short interval before the stressed syllable.

The types of stress foot contours identified were: (i) the plateaux PA, PB and PC; (ii) the prominence-lending rise-fall PD; (iii) the falls FA, FB and rise–fall FC; and (iv) the rises RA and RB. Optional micro-plateaux can occur immediately to the left of certain stressed syllables and at peaks of rise–falls.

The pitch movements identified at breath group edges were: (i) right edge falls; (ii) right edge rises; (iii) right edge plateaux; and (iv) left edge rises. Some edge movements are only found adjacent to a restricted set of stress foot contours.

Turning to higher level organisation, breath groups often belong to larger, intonationally cohesive units. Within such units, the right edge of breath groups end in edge rises and plateaux; at the end of such units, they end in falls. A degree of control is exercised over the relative pitch onset height of breath groups within these higher level units, and to mark reported speech.

In the analyses below, the primary focus will be on the pitch movements described above in terms of stress foot contours, micro-plateaux and edge movements.

5.5 The autosegmental metrical analysis of intonation

This section introduces the **autosegmental metrical** (AM) framework of intonational analysis, in terms of which intonation in Kayardild is analysed in §5.6. Key overviews on which the following outline is based are Ladd (1996), Shattuck-Hufnagel (1996), Beckman (1996) and Gussenhoven (2004).

5.5.1 Fundamental approach

Within the AM framework, intonational tunes are represented primarily as a succession of level tones, either H(igh) or L(ow), which are associated with particular parts of the prosodic structure of an utterance, and aligned in various ways with the segmental string. An important distinction is drawn between **association**, which is the basic phonological relationship holding between a tone and some part of prosodic structure, and **alignment** which concerns tonal realisation with respect to the segmental string: for example, a tone may be associated with one syllable but be aligned with (and so timed synchronously with) a segment in a neighbouring syllable. Sometimes, a tone associates with more than one part of the prosodic structure, in which case it is realised at more than one place. Actual, surface intonation contours are realisations of the tonal string, derived primarily by a process of pitch interpolation between the pitch **targets** corresponding to its constituent H and L level tones. Notwithstanding this, a point of debate within the AM framework (discussed at some length in Ladd 1996) is whether, and to what extent, the string of H and L tones is sufficient for representing an intonation contour. Ladd uses the label **intrinsic** to refer to information represented within the tonal string, and argues that some phonological properties of intonational contours ought arguably to be represented as **extrinsic** features, apart from the tonal string. In particular, information about pitch **register** (the height of tones within a speaker's range) and pitch **span** (the distance in pitch height between H and L tones) can at times be orthogonal to the H/L distinction, and not derivable from it.

Below, §5.5.2 discusses tones then §§5.5.3–5.5.4 turn to the topics of pitch register and pitch span.

5.5.2 Tones

In terms of their relationship to prosodic structure, intonational tones come in two basic types. **Pitch accents** are tones associated with heads of feet, and **boundary tones** are associated with the edges of prosodic domains.[28] Tones may be simple, and comprised of just H or L, or complex, for example HL or LHL.

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[28] Earlier versions of AM theory also recognised the existence of so-called 'phrase accents', but these are now understood to be boundary tones with multiple associations and hence multiple realisations (Grice et al. 2000; Gussenhoven 2000). This issue will not be relevant to the analysis in §5.6.

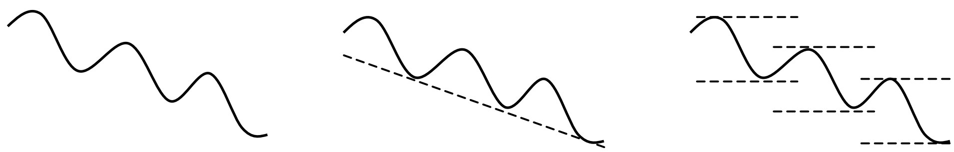
Following the seminal work of Pierrehumbert (1980) on English, for a long while pitch accents have been recognised as consisting of one, central, **starred** tone, H* or L*, plus possible, unstarred **leading** or **trailing** tones. Within the AM research tradition, a variety of phonological and phonetic properties have been associated with the starred/unstarred distinction, but as argued by Arvaniti et al. (2000), these properties can fail to align with one another in the manner commonly assumed. The question of how these theoretical issues relate to analysis of Kayardild will be considered in §§5.6.3 below.

Boundary tones are associated with the edges of prosodic domains, in particular with the edges of domains above the foot level. The relevant domains in §5.6 below will be the breath group, β and intonational utterance, υ. Following a notational convention due originally to Hayes and Lahiri (1991) and now widely adopted, boundary tones will be written as H or L plus a subscript β or υ indicating the prosodic domain with which they are associated. Under an earlier transcriptional practice, the '%' and '-' symbols are used with H and L to transcribe boundary tones associated with higher and lower prosodic domains respectively (typically the 'intonation phrase' and the 'intermediate phrase').

5.5.3 Pitch register

A central issue in the analysis in §5.6 will be the treatment of changes in pitch register that occur as an intonation contour unfolds. Since Pierrehumbert (1980), one of the aims of the AM approach to intonation is to account for global movements in pitch (especially falls) in terms of local pitch events. The general, cross-linguistic empirical observation to be accounted for is that in addition to there being highs and lows in intonation contours, in most languages and in most contour types there will be larger scale changes in pitch, as a sketched schematically in (5.137a) ((5.137) features a global decline in pitch).

(5.137) a. b. c.

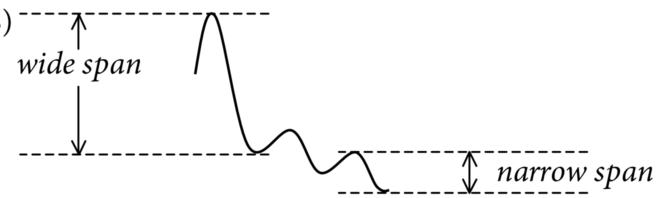


Several (non-AM) accounts of global pitch movement suppose that H and L tones are superimposed over a 'base line', represented as a continuous function, as shown in (5.137b). An alternative, which is often pursued in AM accounts, is that declination is due to a series of local, discrete and discontinuous readjustments of the pitch register, as indicated in (5.137c). A point of discussion which ensues is how such discrete movements are to be represented phonologically. In Pierrehumbert's original (1980) analysis of English for example, discrete downward changes in register (termed **downstep**) were triggered automatically after a LH tonal string, in which case the register change was derivable from, and thus ultimately represented within, the tonal string — in Ladd's terminology, it was is 'intrinsically' represented. As Ladd has subsequently argued (1983; 1996), this analysis is problematic, and downstep is properly an extrinsic property of English intonation, not predictable from the tonal string. A downstepped high tone is usually transcribed '!H.'

5.5.4 Pitch span

Another aspect of an intonation contour which has the potential to be phonologically relevant is pitch span, illustrated in (5.138).

(5.138)



In principle pitch span could be represented either intrinsically or extrinsically, though I am not aware of any analyses of the former type. As Gussenhoven notes, wide pitch span usually involves the raising of H pitch targets while the level of L stays unchanged (2004:76). The notation '^H' is sometimes used to indicate the **expanded** H tones associated with wide pitch span.

In §5.6 the phonological control of both pitch register and pitch span is analysed as being a key component in the intonation system of Kayardild.

5.5.5 Summary: the content of an AM analysis

An AM analysis of intonation in a given language will specify a tonal inventory of pitch accents and boundary tones, in terms of which all observed intonation contours can be accounted for, perhaps in tandem with additional, extrinsic features relating to pitch register and span. A full analysis will also provide an explicit description of how these phonological representations are realised phonetically.

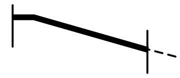
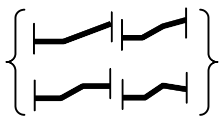
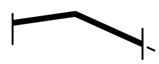
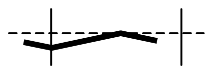
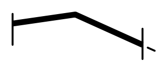
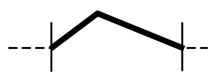
5.6 An autosegmental metrical analysis of Kayardild intonation

This section presents an autosegmental metrical analysis of Kayardild intonation which has two main components. The first is a detailed and explicit representation of pitch register and pitch span, in terms of 'extrinsic' features, set out in §5.6.1. The second is an analysis of the tonal string, composed of pitch accents and boundary tones. The basic analysis of pitch accents is offered in §5.6.2 and of boundary tones in §5.6.4. In addition, two analyses of pitch accents in terms of starred and unstarred tones are considered in §5.6.3. The chapter concludes in §5.6.5 with a comparison of the nature of the analyses below with an existing, preliminary AM analysis of Kayardild due to Fletcher, Evans and Round (2002).

Table (5.139) lists the inventory of pitch accents which will be argued for below. Each accent has a tonal sequence of one to four individual tones, of which some may be optional[29] — in (5.139) and in the discussion in sections below, the obligatory tones in pitch accents are underlined. Pitch register and pitch span features of the accents are listed on the right hand side in (5.139), and the correspondences between pitch accents and the stress foot contours of §5.4 are indicated also.

[29] By 'optional' I mean that the tone in question surfaces only sometimes, and that at it is currently unclear what factors might underlie the variation.

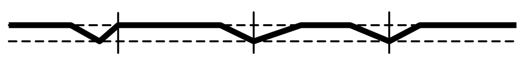
(5.139) Inventory of pitch accents

Tonal sequence (<u>T</u> = obligatory)		Corresponding 'stress foot contour'		Register feature	Span feature
<u>H</u>		FA		downstepped H	narrow
H <u>H</u>		PA		default	narrow
H <u>H</u> <u>H</u>		FB		downstepped H	narrow
<u>H</u> L <u>L</u> <u>H</u>		PB		default	narrow
<u>L</u> <u>L</u> H	(a)	RA, RB		upstepped L	wide
	(b)	RA, RB		no change	wide
L <u>L</u> <u>H</u> H	(a)	FC		downstepped H	narrow
	(b)	PC		default	narrow
	(c)	FC		lowered L	very wide
	(d)	PD		raised L	very wide

5.6.1 Pitch register and span features for pitch accents

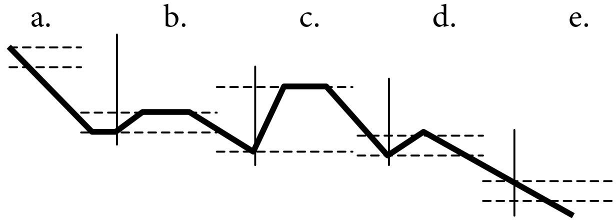
Features controlling pitch register and span constitute a significant part of the phonological representation of pitch accents in Kayardild. (Since pitch span features in (5.139) are always predictable from the register features, it will be assumed here that only the register features are phonologically represented.) Register features determine the local height of the upper and lower bounds of the pitch register, thus setting the pitch height at which surface H and L tone targets are realised. In many cases, register features are all that distinguishes one pitch accent type from another. This section sets out the interpretation of the six register features: [default], [downstepped H], [upstepped L], [no change], [raised L] and [lowered L].

The [default] feature co-occurs with a [narrow] pitch span, and with the tonal strings HH, HLLH and LLHH. It is the feature corresponding to the low prominence, plateau pitch accents, in which the upper bound of the pitch register is set at a comfortable mid-range pitch, and the lower bound is set only slightly lower. A series of pitch accents with [default] register will appear as sketched schematically in (5.140). In (5.140) and the diagrams to follow, the higher and lower bounds of the pitch register are indicated by dashed horizontal lines, the left edge of stressed syllables by solid vertical lines, and the pitch track by a thick, solid line.

(5.140) 

The [downstepped H] feature co-occurs with [narrow] pitch span, and with the tonal strings H, HHH and LLHH. It lowers the upper bound of the pitch register from its level in the preceding pitch accent — or, at the left edge of a breath group, it sets it relatively high in the speaker's mid pitch range. The register feature of pitch accents (5.141a, b, d, e) is [downstepped H].

(5.141) a. b. c. d. e.

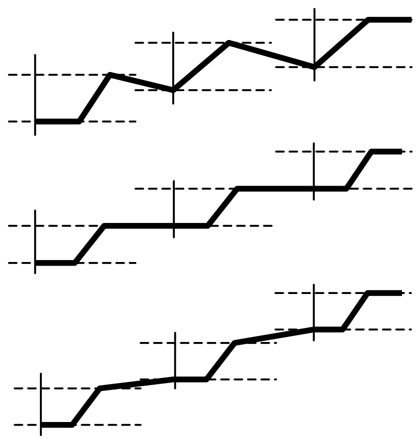


The [upstepped L] feature co-occurs with the [wide] span feature and with the rising tonal string LLH; it raises the lower bound of the pitch register from its level in the preceding pitch accent — or, at the left edge of a breath group, sets it is relatively low in the speaker's pitch range. The actual phonetic implementation of [upstepped L] varies somewhat: in some instances, the upstepped distance exceeds the width of the pitch span; in others it is equal to it or is less than it. The three outcomes of this are sketched in (5.142a–c), and are recognisable as the variable realisations of the rising RB stress foot contour introduced in §5.4.2 above.

(5.142) a.

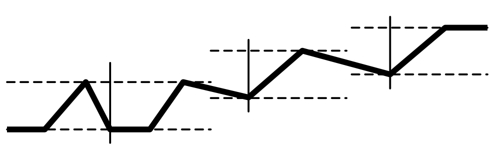
b.

c.



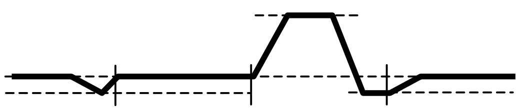
The [no change] register feature also co-occurs with the [wide] span feature and with the rising tonal string $\underline{\mathrm{LL}}\mathrm{H}$; it holds the pitch register at approximately the same setting as in the preceding pitch accent. The resulting pattern was seen at the start of example (5.115) above and is sketched in (5.143b).

(5.143) a. b. c. d.



The [raised L] and [lowered L] register features both co-occur with the [very wide] span feature; they set the lower bound of the register respectively slightly higher or lower than it was in the preceding pitch accent, while the upper bound is set quite high. At the left edge of a breath group, they set the lower bound at a comfortable, mid-range level. This register feature, together with the L$\underline{\text{LH}}$H tone sequence yields the high prominence, FC rise–fall sketched in (5.141c) above and the high prominence, PD rise–fall in (5.144):

(5.144)



A topic for future research into Kayardild pitch register and span is the nature of sandhi-like interactions that occur between the various register features introduced above. For example, when a section of rising intonation comes to an end, an immediately following fall will not be downstepped, and a following plateau will not be realised at the default pitch level. An exploration of these issues falls outside the scope of the present study.

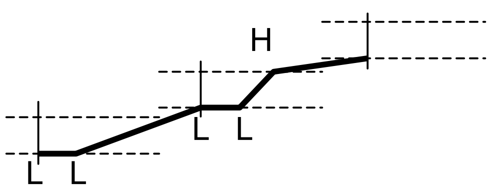
5.6.2 The internal structure of pitch accents

This section and the following two discuss the analysis, within an AM framework, of the six tonally contrastive pitch accents in Kayardild — that is, from this point onwards matters of pitch register and span will be abstracted away from. In table (5.139) six tonal strings were listed: $\underline{\text{H}}$, H$\underline{\text{H}}$, H$\underline{\text{HH}}$, $\underline{\text{H}}$L$\underline{\text{LH}}$, $\underline{\text{LL}}$H, L$\underline{\text{LH}}$H. This section sets out the motivations behind these tonal analyses. Let us begin by focusing on the commonalities behind the optional tones, before discussing the individual pitch accents as wholes.

Four of the six tonal sequences contain a non-final optional tone. All of the these non-final optional tones are posited in order to represent the optional, 'leading micro-plateaux' introduced in §5.4.4 above. In all cases, non-final optional tones precede an obligatory tone of the same height which aligns with the left edge of the stressed syllable. When the optional tones are realised at the surface, they align inside the syllable that precedes the stressed syllable. When pitch is interpolated from the optional tone to the following, obligatory tone at the same height the result is a short plateau which terminates at the edge of the stressed syllable.

Two of the six tonal sequences contain a final optional H tone. In the case of the LLHH tone, if the final optional tone surfaces, then in combination with the preceding, obligatory H tone, it leads to the formation of a short high plateau — the 'peak micro-plateau' of §5.4.4. In the case of the LLH tone, the presence or absence of the optional H tone at the surface gives rise to the difference between the RA and RB stress foot contours, as shown schematically in (5.145a,b).

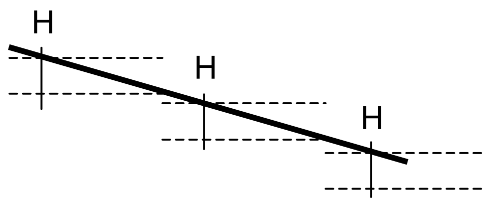
(5.145) a. (≡RA) b. (≡RB)



The reason for analysing the RA/RB contours as variants of a single pitch accent LLH rather than as two accents (LL and LLH) is that the difference between the two surface strings appears to be of the same kind as the difference between rise–falls with or without a micro-plateau at their peak — that is, a variation in realisation, rather than a contrast between two distinct pitch accent types.

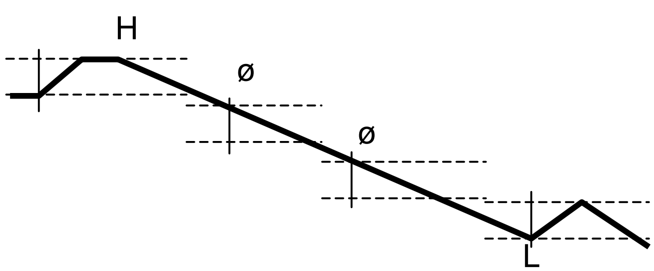
Three of the pitch accents consist only of H tones: <u>H</u>, H<u>H</u> and H<u>HH</u>. The simplest of these, <u>H</u>, is the pitch accent corresponding to stress foot contour FA — a straight fall without any deviation as the pitch track passes from one stressed syllable to the next. That is to say, straight falls are analysed as illustrated in (5.146).

(5.146)



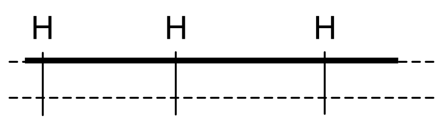
As an alternative analysis, it could be supposed that the stressed syllables within a straight fall are unaccented, with the undeviating pitch track due to long-distance pitch interpolation, as sketched in (5.147), with unaccented stressed syllables marked ‘ø’.

(5.147)



There are grounds for rejecting the unaccented analysis though. On occasion a straight fall will occur at the very left edge of a breath group (an example is (5.119) above), and preferably the fall should be analysed as beginning with a H tone.[30] Such a H tone need not be part of a pitch accent; a boundary tone would suffice, however, the tone will be analysed here as part of a pitch accent, because a left edge H boundary tone is otherwise unmotivated in the Kayardild intonational system. In addition, analysing a long straight fall as a series of $\underline{\text{H}}$ accents as in (5.146) is in keeping with the analysis of a long straight plateau as a series of $\underline{\text{H}}$ accents (that is, a series of H$\underline{\text{H}}$ accents without the optional H), as shown in (5.148) and discussed below.

(5.148)



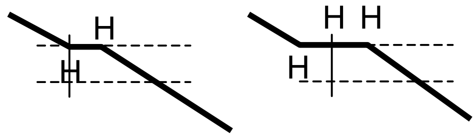
The second pitch accent comprised only of H tones is H$\underline{\text{H}}$. The motivation for positing an obligatory $\underline{\text{H}}$ rather positing ø and invoking pitch interpolation, comes from the uniform analysis of leading micro-plateaux that was outlined above: micro-plateaux can be uniformly analysed as the realisation of an optional tone which precedes an obligatory tone of the same height. Since a micro-plateau can precede a flat plateau (cf. example (5.116) above), the pitch accent is analysed as containing an obligatory $\underline{\text{H}}$.

The third pitch accent comprised only of H tones is H$\underline{\text{HH}}$. This accent is realised as a short 'terrace' in falling contour as sketched in (5.149a,b). The final $\underline{\text{H}}$ aligns with the beginning of the stressed vowel, where the short terrace ends. Like all obligatory tones

[30] If this weren't done, the onset height of the fall would need to be follow from some other aspect of the analysis.

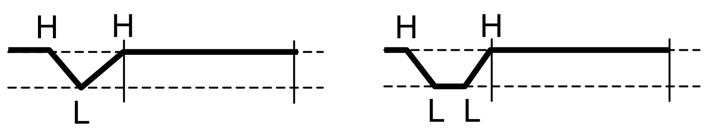
preceded by an optional tone, the first obligatory H aligns with the beginning of the stressed syllable. The optional tone as always aligns somewhere in the preceding syllable.

(5.149) a. b.



The next pitch accent type is HLLH. This is the plateau preceded by a short, shallow dip, sketched in (5.150a,b).

(5.150) a. b.



The obligatory L tone, preceded by an optional L tone, aligns with the start of the stressed syllable or even somewhat earlier. This early alignment may appear to break with the generalisation that all obligatory tones which can be preceded by optional tones align at the very start of the stressed syllable, but the deviation can be explained with reference to the alignment of the final H tone. The final H tone of HLLH aligns at the left edge of the stressed syllable. Presumably, either a degree of tonal repulsion pushes the obligatory L backwards somewhat, or else the L tone is phonetically undershot — that is, in an attempt to reach the pitch target of the final H on time, pitch begins rising temporally prior to the alignment point of the L tone. The initial H tone does not appear to have any strict alignment point, rather it precedes the following L tone by some short distance.

The <u>LL</u>H pitch accent is found in local rises. The first <u>L</u> tone aligns with the start of the stressed syllable. The alignment of second <u>L</u> tone is variable. It falls somewhere within the stressed syllable, usually late in the vowel. The optional H tone also has a variable alignment. A full examination of the alignment of these tones, and possible conditioning by other factors, is beyond the scope of this study.

The L<u>LH</u>H pitch accent is realised as the rise in rise–falls (the fall results from pitch interpolation down onto the first tone of the next pitch accent). As expected, the obligatory <u>L</u> tone aligns with the left edge of the stressed syllable and the optional L tone somewhat before that. The obligatory <u>H</u> tone exhibits a wide range of alignments. Again, a full examination of these is beyond the scope of this study, but the following can be noted. The obligatory <u>H</u> aligns as early as the middle of the vowel in the stressed syllable and as late as two syllables to the right of the stressed syllable, though most commonly, it aligns between the end of the stressed vowel and the vowel of the next syllable. I have noticed that cases of very late alignment often involve the presence of an intervocalic /r/ segment somewhere between the <u>L</u> tone and the <u>H</u> tone — this may be important because when /r/ is realised as a single tap [ɾ] it is short compared with any other consonant, and the 'late' alignment in segmental terms may not be all that late in terms of absolute duration. The optional H aligns a short distance after the obligatory <u>H</u>.

5.6.3 A starred/unstarred analysis of Kayardild pitch accents

In the AM framework, pitch accents are usually analysed as possessing a degree of internal structure. A number of properties have been identified in the literature, according to which the individual component tones of pitch accents can be contrasted with one another. As mentioned in §5.5 above, the assumption has been made in much AM research that the component tones of a given pitch accent fall into two types: a unique and obligatory starred tone, and possible unstarred, leading or trailing tones.

In an significant theoretical paper, Arvaniti et al. (2000) provide a critique of the notion of the starred/unstarred distinction. After reviewing several properties identified in the literature as characteristic of starred or unstarred tones, the authors demonstrate that in the case of some well-understood empirical examples, the analyses predicated on one or other property fail to align with those based on others. The conclusion is that the theoretical status of the starred/unstarred distinction is uncertain, because its multiple definitions are not entirely consistent.

In §5.6.3.1 the Kayardild pitch accents are measured against the yardsticks reviewed by Arvaniti et al. (2000), which yields results that are somewhat inconsistent. In §5.6.3.2 two modifications to the notion of starred tones, suggested by Arvaniti et al., are adopted, leading to at a more coherent analysis of the Kayardild pitch accent inventory.

5.6.3.1 Analyses according to traditional measures

There are five properties of starred tones and unstarred tones which are examined here. Tables (5.151) and (5.152) compare four of those properties against each individual tone in the six pitch accents of Kayardild, and indicate whether, based on each property, that tone could be, or should not be, analysed as a star tone (indicated '+' or '–' respectively). The property not shown in (5.151)–(5.152), 'culminativity,' simply states that one and only one tone per pitch accent can be a starred tone. All five properties are introduced below and discussion follows.

(5.151)

	$\underline{\mathrm{H}}$	H	$\underline{\mathrm{H}}$	H	$\underline{\mathrm{H}}$	$\underline{\mathrm{H}}$
Head persistence	+	–	+	–	+	+
Consistent alignment	+	–	+	–	+	+
Internal alignment	+	–	+	–	+	+
Spreading	+	–	–	–	–	+

(5.152)

	$\underline{\mathrm{H}}$	L	$\underline{\mathrm{L}}$	$\underline{\mathrm{H}}$	$\underline{\mathrm{L}}$	$\underline{\mathrm{L}}$	H	L	$\underline{\mathrm{L}}$	$\underline{\mathrm{H}}$	H
Head persistence	+	–	+	+	+	+	–	–	+	+	–
Consistent alignment	–	–	+	+	+	–	–	–	+	–	–
Internal alignment	–	–	–	+	+	–	–	–	+	–	–
Spreading	+	–	–	+	+	–	–	–	–	+	–

The first proposed property of pitch accents and their component tones can be termed ‘culminativity’. It states that in each pitch accent, at least one and at most one tone will be a starred tone. On this view, a starred tone figures like a prosodic head of its pitch accent.

Related to the notion of starred tones as a prosodic heads is the next property, which can be termed ‘head persistence’. This states that starred tones, being prosodically ‘stronger’ than unstarred tones, are less likely than unstarred tones to be deleted at the surface. The evaluation of this property as shown in (5.151)–(5.152) holds true whether optional tones are assumed to be present underlyingly and then optionally deleted, or absent underlyingly and then optionally inserted.

The next two properties relate to phonetic alignment. Starred tones have been presumed (i) to have a relatively consistent alignment with respect to the segmental string; and (ii) to align within the stressed syllable. Unstarred tones, it is proposed, sometimes share these alignment properties, but other times do not. These two alignment properties are listed as ‘consistent alignment’ and ‘internal alignment’ in (5.151)–(5.152).

The final property listed in (5.151)–(5.152) is ‘spreading’. This states that unstarred tones may ‘spread’: that is, in addition to the underlying tone, a copy may surface, with the resultant pitch interpolation between the two producing a surface plateau. If this is true, then in Kayardild the obligatory tones which sit at one end of micro-plateaux should preferably be analysed as underlying, unstarred tones, and their neighbouring optional tones as copies — the evaluation of ‘spreading’ in (5.151)–(5.152) makes this assumption.

Ideally, after taking all of these properties into account, it should be possible to find for each Kayardild pitch accent at least one tone that could suffice as its unique starred tone. A glance at (5.151)–(5.152) shows that this is not the case. A clear analysis arises for $\underline{\text{H}}$ (as H*), for H$\underline{\text{HH}}$ (as HHH*), for $\underline{\text{H}}$L$\underline{\text{LH}}$ (as HLLH*) and for $\underline{\text{L}}$LH (as L*LH), but not for the other two pitch accents. If the assumption is abandoned that micro-plateaux are due to spreading — and accordingly, if ‘spreading’ in (5.151)–(5.152) is ignored — then the results in (5.153) are obtained.

(5.153) Analysis of Kayardild pitch accents along traditional lines

Tonal sequence	$\underline{\text{H}}$	H$\underline{\text{H}}$	H$\underline{\text{HH}}$	$\underline{\text{H}}$L$\underline{\text{LH}}$	$\underline{\text{LL}}$H	L$\underline{\text{LH}}$H
Analysis	H*	HH*	HH*H or HHH*	HLLH*	L*LH	LL*HH

These results accord with most of the traditionally recognised properties of starred and unstarred tones, though it is worth noting that under this analysis, it is difficult to state which of the unstarred tones are obligatory and which are optional other than by listing them. In §5.6.3.2, an appeal is made to an alternative interpretation of the starred/unstarred distinction and arrive at an analysis which is more predictive of tone optionality in the pitch accent system.

5.6.3.2 A modified analysis, after Arvaniti et al. (2000)

Having identified inconsistencies in the definition of the starred/unstarred distinction and problems in its application to empirical data, Arvaniti et al. (2000) propose a revision in which the phonological notion of starred tones as prosodic heads is abandoned, and the phonetic expectation that starred tones align within the stressed syllable is relaxed. Instead, and starred tones are defined in terms of alignment, as pitch accent tones that align in a consistent manner *relative* to a stress syllable, even if they do not align within it. Consequently, pitch accents may contain multiple starred tones. Applying this revision to Kayardild yields the analysis shown in (5.154).

(5.154) Analysis of Kayardild pitch accents following Arvaniti et al. (2000)

Tonal sequence	H	HH	HHH	HLLH	LLH	LLHH
Analysis	H*	HH*	HH*H*	HLL*H*	L*LH	LL*HH

A significant advantage of the analysis in (5.154) is that the optional aspects of Kayardild pitch accents become predictable. Specifically: (i) one unstarred H tone is optionally deleted from any TT sequence (i.e., from any sequence of two unstarred tones); and (ii) an unstarred tone is optionally deleted from any $T_\alpha T^*_\alpha$ sequence (i.e., from HH* or LL*). Expressed formally as rules, these two generalisations appear as in (5.155) and (5.156).[31]

(5.155)	Trailing H deletion:	H	$\rightarrow$	ø	/ T ___	(optional rule)
(5.156)	Leading plateau simplification:	T_α	$\rightarrow$	ø	/ ___ T^*_α	(optional rule)

5.6.3.3 Concluding remarks regarding pitch accents

In §§5.6.3.1–5.6.3.2 two analyses of the internal structure of pitch accents are set out. The former adheres to assumptions of a well established tradition, and so is probably more useful for purposes of cross linguistic comparison than the latter analysis. On the other hand, the latter analysis provides some support for the revisions suggested by Arvaniti et al. (2000) to the theoretical distinction between starred and unstarred tone, in that it leads to a straightforward analysis of tonal optionality which is not available under the former analysis. Notwithstanding the fact that strengths and weaknesses can be identified in both analyses, I hesitate to argue that either is superior for one main reason.

The pitch accent system of Kayardild consists of six tonally contrastive accents, five of which are complex and four of which are comprised of three or more tones. Compared to the pitch accents of most other languages, Kayardild pitch accents are complex — of the eleven languages surveyed by Jun (2005) for example, only one possessed any pitch accents comprised of more than two tones.[32] Future research may

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[31] A constraint-based analysis is also possible, but is not given here for reasons of space.

[32] This was Chickasaw (Gordon 2005), which contrasts LHHL, HL, LL and LHH.

uncover ways in which the fine-scaled characterisation of Kayardild intonation can be maintained without invoking such tonal complexity in pitch accents. In particular, some pitch accents tones might be amenable in time to reanalysis as boundary tones corresponding to low level prosodic domains which have not yet been identified, or may become predictable according to principles which have not yet come to light.

5.6.4 High level domains and boundary tones

The analysis of Kayardild intonation here conservatively relies on just two high level domains relevant to intonation — the breath group, β and above that the intonational utterance, υ. Future research may lead to the positing of domains below β.

In keeping with the limited number of high level domains, only a handful of boundary tones and boundary tone sequences are posited, listed in table (5.157).

(5.157) Inventory of boundary tone combinations

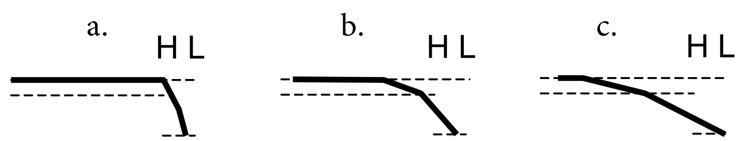
Boundary tones	Corresponding edge movement
$H_{\beta}L_{\upsilon}$	Right edge fall
$H_{\beta}H_{\beta}$	Right edge rise
H_{β}	Right edge plateau
L_{β}	Left edge rise

The following paragraphs explain how the tonal analyses correspond to surface realisations, beginning with the right edge tones.

The $H_{\beta}L_{\upsilon}$ sequence at the right edge surfaces as a final fall. Recall from §5.4.6 that these falls occur only after plateaux; recall also from §5.6.1 that the pitch span for plateaux is [narrow]. In contrast, the span for any low boundary tone is [wide]. Specifically, for the

$H_\beta L_\upsilon$ sequence the upper bound of the pitch register remains the same as in the preceding pitch accent, but the lower bound drops. The H_β tone is interpreted as a pitch target at the top of the register, and the L_υ as a target at the bottom. In order to account for the variation in the extent of the final fall (cf. §5.6.1), the L_υ pitch targets are analysed as aligning with the very right edge of segmental material,[33] and the H_β slightly to the left of the L_υ tone. The inner, H_β tone is then variably undershot — that is, in order to reach the L_υ target, pitch may begin dropping up to a syllable before the point where the H_β aligns, as sketched in (5.158a–c).

(5.158)

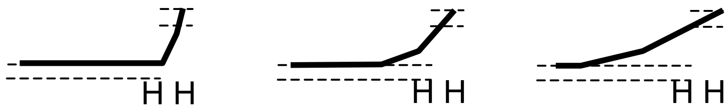


By analysing the $H_\beta L_\upsilon$ sequence as breath group H tone plus an utterance L tone, the inventory of edge tones is kept small: the only utterance level edge tone is L_υ, and breath group edge tones are always H, never L, on the right edge.

In the $H_\beta H_\beta$ edge sequence the second H_β is upstepped (the same occurs in right edge HH sequences in English – Pierrehumbert 1980). As in the $H_\beta L_\upsilon$ sequence, the first tone is variably undershot, as shown in (5.159a–c).

[33] Actually, it may be more correct to assume it aligns with the edge of sonorous material.

(5.159) a. b. c.



The pitch register for the single H$_\beta$ right edge tone is maintained at the level of the preceding pitch accent, and so a H$_\beta$ edge tone is realised as a final plateau.[34]

On the left edge, L$_\beta$ surfaces as a rise into a following plateau (L$_\beta$ does not occur at the edge of falling or rising contours, cf. §5.4.6). It is assumed here that the L$_\beta$ tone is followed by a H* pitch accent (i.e., the accent which is underlyingly HH*, corresponding to the stress foot contour PA in §5.4). The single H* tone of this pitch accent usually aligns with the left edge of a stressed syllable, and it can be assumed that in the relevant cases at the left edge of a breath group, it aligns just after a L$_\beta$ tone, as sketched in (5.160a–c). The relevant pitch span for the L$_\beta$ edge tone is [wide], with the upper bound at the same pitch as for the H* pitch accent and the lower bound relatively lower. The H* tone gets variably undershot.

(5.160) a. b. c.

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[34] An exception occurs after the prominence lending LLHH pitch accent with [very wide] pitch span (corresponding to the PD stress foot contour of §5.4). Here, the register for the H$_\beta$ edge tone resets to [default]. This exception can be added to the list of 'pitch register sandhi' phenomena flagged in §5.6.1 as requiring further research.

In sum, when two tones as are associated with the same prosodic edge in Kayardild, the tone associated with the higher prosodic domain occurs outermost; and whenever two tones are associated with the same edge, and the inner tone gets variably undershot. There is only one utterance level boundary tone, the right edge L_{υ}. At the breath group level there is a left edge L_{β}, a right edge H_{β} tone and a right edge $H_{\beta}H_{\beta}$ sequence. The L_{υ} tone only occurs after a single H_{β} tone.

5.6.5 Comparison with Fletcher et al. 2002

The AM analysis of Kayardild intonation proposed in §§5.6.1–5.6.4 above is not the first. Fletcher, Evans and Round (2002) (henceforth, FER) is a four page paper setting out an AM analysis of Kayardild comprising an inventory of pitch accents and boundary tones, a discussion of some tunes types and comments on the association between tune type and two particles, 'counterfactual' *maraka* /maɻaka/ and 'frustrated' *nginja* /ŋiɲca/.[35] This section compares the analysis above with that of FER, concentrating on four points of divergence not so much in the results of the analyses, as in the phenomena which are analysed and the mode of analysis. The comparison serves the dual purposes of comparing the analysis in §5.6 with the existing analysis of FER, and of accentuating some of the principled choices which stand behind the analysis in §5.6 above.

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[35] On /maɻaka/ see fn.24 on p.391 above. The particle /ŋiɲca/ occurs only rarely in texts. FER claim (p.298) it occurs in their corpus with an expanded ^H* accent, but this does not seem to be true generally: in example (5.121) above, /ŋiɲca/ appears under a normal (unexpanded) rise-fall.

The inventory of pitch accents and boundary tones proposed by FER is listed in (5.161).

(5.161) Inventory of Fletcher, Evans and Round (2002)

Pitch accents	H*	L*	!H*	^H*	LH*	L^H*
Right edge boundary tones	H%	L%	!H%	^H%	LH%	
Left edge boundary tones[36]	%H	%L	%!H			

The first significant difference between the analysis in §5.6 and FER's analysis is the status of pitch accents with respect to prosodic structure in general. In FER's analysis starred tones are defined as having been 'judged to be associated with a metrically strong syllable' (2002:296), but FER add that it is not yet apparent 'whether there is the same kind of relationship [in Kayardild — E.R.] between the lexical stress system and higher levels of intonational and prosodic organization that you find in languages like English.' (2002:295). The analysis in §5.6 on the other hand is integrated with the analysis of stress presented earlier in this chapter, and via that into the overall analysis of prosodic structure in Kayardild. This provides an unsurprising, affirmative answer to the question of whether, like other, more extensively researched languages, the intonation system in Kayardild is integrated into the broader prosodic system of the language.

A second difference is the level of descriptive detail aimed at by the two analyses. FER propose just two complex accents, LH* and L^H*, both of which figure only in rising

[36] The published paper FER also list a fourth left edge possibility, the 'unmarked' % boundary. This appears to be an error; in our Kayardild transcriptions we had recognised only three onset heights, which are already signified by %H, %!H and %L.

contours. All other contours are described by mono-tonal accents. As was remarked upon in §5.6.3.3, a somewhat unusual feature of the analysis in §5.6 is the complexity of the pitch accents proposed, and the level of detail which they give representation to.

A point on which the two analyses only partially overlap is in the analysis of pitch register and span. FER's system contains two pitch accents with expanded highs (^H* and L^H*) corresponding to wide pitch span, and one with downstep (!H) corresponding to lowered pitch register. The analysis in §5.6 provides an account of pitch register and span for all pitch accent types and all boundary tones, and by those means attempts to providing a comprehensive account of global pitch movements within intonation contours, as well as an account of pitch settings at the left and right edges of breath groups.

The fourth difference relates to analytic content of boundary tones. In FER's account, boundary tones arguably function as representations of pitch register as opposed to tones *per se*. For example, left edge %H, %!H and %L tones are posited where the onset pitch level in a breath group is high, mid or low respectively. In the analysis of §5.6, pitch register at breath group onsets is represented via the register features that correspond to the local pitch accents and boundary tones, whereas a L_β edge tone for example is treated as a true tone, realised as a pitch target at the lower bound of the pitch register.

6 Syntax, morphosyntax and inflection

This chapter sets out in detail the manner in which the syntax of Kayardild relates to its inflectional morphology. When a word in Kayardild appears in a given syntactic environment, it must appear in an appropriate inflected form and so it makes sense to speak of some kind of transfer of information between the syntactic and morphological components of the language's grammar. To formalise this, it will be assumed that a set of **morphosyntactic features** is calculated for each word in a sentence. These provide all of the information needed by the **realisational morphology** to spell out an appropriate inflected form of the word, in a manner which can then be interpreted by the phonology. The process of morphological realisation itself will be the focus of Ch.7. In the present chapter, an account is given of how the set of morphosyntactic features is determined for a given word, on the basis of its syntactic environment. The chapter is structured as follows. Section 6.1 offers a preliminary introduction to the morphosyntactic features in terms of which the Kayardild syntax–morphology interface will be analysed; §6.2 flags several issues in the relationship between form and function in Kayardild which will be relevant in the sections that follow; and §6.3 briefly introduces the most central, empirical morphosyntactic phenomenon in Kayardild, concord. Section 6.4 outlines the major issues to be addressed in the analysis of the relationship between syntax and morphosyntactic features, which are then expanded upon in §§6.5–6.9. Section 6.10

reviews the nature of recursion in Kayardild inflection, §6.11 discusses the implications of this for existing formal treatments of Kayardild inflection, and §6.12 summarises the findings of the chapter as whole.

At several points throughout the chapter, comparisons will be made between the analysis proposed here and the corresponding analysis of Evans (1995a). To help keep track of both analyses and to keep them distinct, units of analysis due to Evans will be placed in italics.

6.1 Inflectional categories

Kayardild inflection will be analysed here in terms of six dimensions, each of which is represented formally as a feature capable of taking various values. All features will be treated as privative, that is, words may be positively specified for one of the permissible values of a feature or they may be entirely unspecified for it. Notational conventions which will be used are: (i) F:Ø to indicate that a word is unspecified for feature F; (ii) +F to indicate that a word is specified for feature F; and (iii) F:v to indicate that a word is specified for value v of feature F. The six features are introduced below, and their permissible values tabulated.

6.1.1 Features and values

CASE takes any one of the twenty-three values shown in (6.1). The morphosyntactic feature CASE indexes several distinct kinds of syntactic relationship: between DPs and their dominating clause or verb,[1] between a DP and another DP that it modifies,[2] and between a predicate DP and its subject. A distinction will also be made here between 'thematic' and 'athematic' case values, which will be clarified in §6.2.6 below.

(6.1) Values of the feature CASE, and abbreviations used in interlinear glosses

Athematic CASE values	Ablative (ABL), allative (ALL), associative (ASSOC), consequential (CONS), denizen (DEN), genitive (GEN), instrumental (INST), locative (LOC), oblique (OBL), origin (ORIG), privative (PRIV), proprietive (PROP), utilitive (UTIL);
Thematic CASE values	Dative (DAT), donative (DON), human allative (HALL), collative (COLL), objective ablative (OABL), objective evitative (OEVIT), purposive (PURP), subjective ablative (SABL), subjective evitative (SEVIT), translative (TRANS).

NUMBER (**NUM**) can take one of the two values shown in (6.2). Most often NUMBER is unspecified, as NUMBER:Ø — this does not signal 'singular', rather that the speaker has chosen not to provide any information. Although personal pronouns are specified as singular/dual/plural, those values correspond to properties of the pronominal stem rather than to a morphosyntactic feature (on which, see further §6.6.4).

[1] This function of CASE is referred to as *relational case* in Evans (1995a).

[2] *Adnominal case* in Evans (1995a).

(6.2)	Values of the feature NUMBER, and abbreviations used in interlinear glosses*
	Dual (DU), plural (PL)
	*Number values on presonal pronouns do not correspond to a morphosyntactic feature (cf §6.6.4); they are glossed in lower case (sg/du/pl).

THEMATIC TENSE/ASPECT/MOOD (TH-TAM) takes any one of the fourteen values shown in (6.3) and signals tense, aspect and mood.

(6.3)	Values of the feature TH-TAM, and abbreviations used in interlinear glosses
	Actual (ACT), antecedent (ANTE), apprehensive (APPR), desiderative (DES), directed (DIR), hortative (HORT), immediate (IMMED), imperative (IMP), past (PST), potential (POT), precondition (PRECON), progressive (PROG), resultative (RES), nonveridical (NONVER).

NEGATION (NEG) is a unary feature conveying clause-level negation.

ATHEMATIC TENSE/ASPECT/MOOD (A-TAM) takes one of the eleven values listed in (6.4) and like TH-TAM, signals tense, aspect and mood. The correspondences between TH-TAM and A-TAM values are somewhat complicated and are discussed in §6.1.3 below.

(6.4)	Values of the feature A-TAM, and abbreviations used in interlinear glosses
	Antecedent (ANTE), continuous (CONT), directed (DIR), emotive (EMO), future (FUT), instantiated (INS), negatory (NEGAT), precondition (PRECON), present (PRES), prior (PRIOR), functional (FUNC).

COMPLEMENTISATION (COMP) takes one of the two values in (6.5). COMP conveys information pertaining to clauses as a whole, either in terms of their relationship to other clauses, or in terms of their containing Topic or Focus DPs. More will be said regarding this in §6.5.1 below.

(6.5)

Values of the feature COMPLEMENTISATION, and abbreviations used in interlinear glosses
Empathy (EMP), plain (COMP).

6.1.2 Corresponding categories in Evans (1995a)

This section details the correspondences between the features and values used in this dissertation and the categories of Evans (1995a). The purpose here is to provide a resource for comparison between the two analyses. Neither analysis is summarised at this point.

The CASE feature in this dissertation corresponds to Evans' (1995a) *adnominal case, relational case* and to *verbal/verbalising* case.[3] The few instances where Evans' *adnominal* or (non-*verbalising*) *relational case* categories fail to correspond directly to CASE values of the same name under the present analysis, are listed in (6.6).

[3] Evans (1995a) employs the term *verbal case*. Evans (2003) modifies this to *verbalising case*.

(6.6)	Athematic CASE value	Evans (1995a) equivalent, and notes
	Consequential	The *consequential case* in Evans' *consequential nominalisation clauses* is analysed here as A-TAM:antecedent and TH-TAM:antecedent, cf §6.2.7.
	Denizen	Corresponds to Evans and Nordlinger's (2004) *verbal denizen case*
	Privative	The *privative case* in Evans' *privative nominalisation clauses* is analysed here as A-TAM:nonveridical, cf §6.2.7.
	Utilitive	Some instances of Evans' *utilitive case* and analysed here as A-TAM:functional, cf §6.2.6.
	CASE:Ø	This corresponds to Evans' lack of *case* marking and to Evans' *nominative case*.

Evans' *verbalising cases* are renamed here as **thematic cases** for reasons which will become clear in §6.2.6. Correspondences between Evans' *verbalising case* and thematic CASE values are shown in (6.7). My approach has been to retain Evans' *case* label, but to discontinue the use of the adjective *verbalising*. Where this would lead to two CASE values having the same label (e.g. with Evans' *allative* and *verbalising allative*), I have selected a new label for the *verbalising*/thematic CASE, based on semantics of the CASE value. Note that two of Evans' *verbalising cases* each possess two formal variants (the *plain* and the *middle*), each of which is a separate case category for the purposes of the grammar (Evans 1995a:171–75). These have also been given separate labels here.

(6.7)	Thematic CASE value	Evans (1995a; 2003) equivalent, and notes regarding the choice of CASE label
	Dative	*Verbal(ising) dative*
	Donative	*Verbal(ising) donative*
	Translative	*Verbal(ising) translative*
	Collative	*Verbal(ising) allative.* Semantically, the entity marked by the collative CASE is construed as becoming co-located with the clausal subject; either may move (Evans 1995a:168–69).
	Purposive	*Verbal(ising) purposive* Evans (1995a) recognises one *verbalising purposive case*, realised by the suffix forms /canic/~/cani:c/. There are grounds to treat the two suffixes separately. CASE:purposive, realised as /cani:c/, corresponds semantically to Evans' *verbalising purposive* (1995a:175–76), marking an adjunct as something which the clausal subject is seeking, missing or hoping to obtain.
	Human allative	*Verbal(ising) purposive* CASE:human allative, realised as /canic/, appears several times in Wurm's (1960) corpus and occasionally in my field recordings. It attaches to personal pronominal stems or stems denoting kin, to mark an allative adjunct whose referent is human.
	Objective ablative	*Verbal(ising) ablative, plain form.* Semantically, this focuses upon the movement of the clausal object from the entity which appears in the objective allative CASE (Evans 1995a:171–73).
	Subjective ablative	*Verbal(ising) ablative, middle form.* Semantically, this focuses upon the movement of the clausal subject (Evans 1995a:171–73).
	Objective evitative	*Verbal(ising) evitative, plain form.* This focuses upon the movement of the clausal object, out of fear, from the entity which appears in the objective evitative CASE (Evans 1995a:173–74).
	Subjective evitative	*Verbal(ising) evitative, middle form.* This focuses upon the movement, out of fear, of the clausal subject (Evans 1995a:173–74).

The NUMBER feature on pronouns corresponds directly to Evans' pronominal *number* (1995a: 201–03). Evans describes several *number and related suffixes* (1995a: 183–87), of which some are derivational rather than inflectional (cf. Ch.3, §3.13.6). The two inflectional values are NUM:dual (Evans' *dual*) and NUM:plural (Evans' *lot*).

TH-TAM and NEGATION here correspond to *tense* and *polarity* in Evans (1995a) or T(ense)A(spect)M(ood)P(olarity) (Evans 2003), as well as to *nominalisation* and *case marking* of inflectionally nominalised verbs (on which see, further §§6.2.6–6.2.7). A full list of correspondences for TH-TAM is given in (6.8).

(6.8)

TH-TAM value	Evans (1995a) equivalent
Actual	*Actual*
Antecedent	*Consequential nominalisation,* cf §6.2.7.
Apprehensive	*Apprehensive*
Desiderative	*Desiderative*
Directed	*Directed*
Hortative	*Hortative*
Immediate	*Immediate, suppositional*[4]
Imperative	*Imperative*
Past	*Past, almost*[5]
Potential	*Potential*
Precondition	*Precondition*
Progressive	*Plain nominalisation,* cf §6.2.6.
Resultative	*Resultative nominalisation*
Nonveridical	*Privative nominalisation,* cf §6.2.7.

A-TAM in this dissertation corresponds to *modality* or *modal case* in Evans (1995a), as well as to as certain kinds of *case* marking, mostly of dependant DPs in *nominalised clauses* (see further §§6.2.6–6.2.7).

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[4] Evans describes three instances (recorded by Wurm 1960) of a *suppositional tense*, which is formally identical to the *immediate* (Evans 1995a: 257–8). Given the semantic breadth of other *tense*/TH-TAM categories such as the potential, it would not be unreasonable on semantic grounds to analyse the *suppositional* as a sub-function of the *immediate*. Moreover, on formal morphological grounds, since there is no difference in realisation between *immediate* and *suppositional*, an analysis in terms of just a single morphosyntactic feature value (TH-TAM:immediate) is what is best motivated within the approach adopted here.

[5] TH-TAM:past corresponds to Evans' *past* and *almost tenses* (1995a:260–61). Evans (1995a:255) observes that the form of the *almost tense* is cognate with *negative+past*, but the synchronic analysis does not explicitly link to two. In addition to similarities in form, *past* and *almost* share the same co-occurrence restriction *vis-a-vis* A-TAM values. On the analysis here, Evans' *almost tense* will correspond to {TH-TAM:past, +NEGATIVE}, and *past tense* to {TH-TAM:past, NEGATIVE:Ø}; the shared A-TAM restrictions will follow from this.

(6.9) A-TAM value	Evans (1995a) equivalent, and notes
Antecedent	*Consequential case* in *consequential nominalisation clauses*, cf §6.2.7.
Continuous	*Associating oblique case*.
Directed	*Directed* (Evans 1995a) or *inceptive* (Evans 1995b; Evans 2003) *modality*, marked by the *modal allative case*.
Emotive	*Emotive modality*, marked by the *modal oblique case*.
Future	*Future modality*, marked by the *modal proprietive case*.
Instantiated	*Instantiated modality* in uncomplementised clauses, marked by the *modal locative case*.
Negatory	*Privative* case in *double privative* clauses.
Present	*Instantiated modality* in complementised clauses, marked by the *modal locative case*.
Precondition	*Prior modality*, marked by a special allomorph of the *modal ablative case*.
Prior	*Prior modality*, marked by the *modal ablative case*.
Functional	*Utilitive case* when appearing in conjunction with a *derivationally nominalised verb*, cf §6.2.6.
A-TAM:Ø	*Zero modality*, not overtly marked or marked by the *nominative case*.

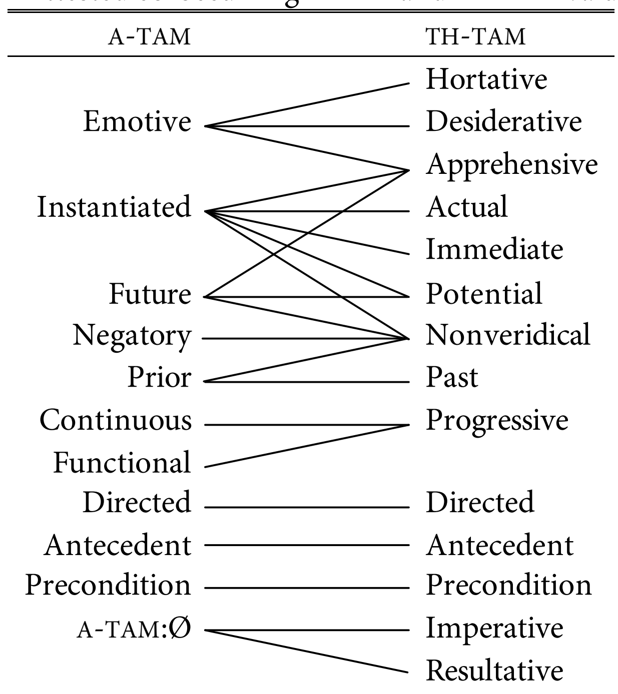
The feature value COMP:plain corresponds to Evans' *complementising oblique case*, while COMP:empathy corresponds to Evans' *complementising locative case* and the *independent use of the locative*.

6.1.3 Co-occurrence restrictions on feature values

There are extensive co-occurrence restrictions on the values of A-TAM, TH-TAM and COMPLEMENTISATION. Table (6.10) show the attested co-occurrences of A-TAM and TH-TAM values (joined by lines) in conjunction with COMP:Ø. Note that where values of

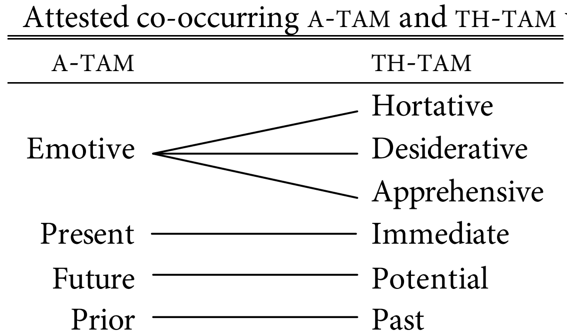
A-TAM and TH-TAM stand in a one-to-one correspondence, they have been given an identical label.

(6.10) Attested co-occurring A-TAM and TH-TAM values in conjunction with COMP:Ø



In conjunction with either COMP:plain or COMP:empathy, the permissible set of co-occurring A-TAM and TH-TAM values is highly constrained, as shown in (6.11).

(6.11) Attested co-occurring A-TAM and TH-TAM values in conjunction with +COMP



6.2 Morphological form and function

Four of the six features which are inflectionally realised in Kayardild are realised by paradigms of suffixes which derive predominantly from erstwhile case suffixes (Evans 1995a: Ch.10; Evans 1995b) — the exceptions are NEGATIVE and NUMBER. This historical backdrop to the synchronic Kayardild system has given rise to a series of complications in the relationships between form and function, which are surveyed in §§6.2.1–6.2.9.

6.2.1 Shared morphomic realisations

Exemplifying the most straightforward situation, what historically was a locative suffix now realises the feature values CASE:locative, A-TAM:instantiated, A-TAM:present, TH-TAM:immediate and COMP:empathy. The synchronic analysis of this is that each of these five morphosyntactic feature values is realised by the same morphomic category, the 'formal locative' (fLOC), which in turn is realised phonologically as the underlying string /ki/ in all cases, as illustrated in (6.12).

(6.12)
a. *yarbuth-iy-a*
jaɻpuṯ-ki-a
animal-fLOC-T
animal-LOC-Ø
'at an animal'

b. *yarbuth-iy-a*
jaɻpuṯ-ki-a
animal-fLOC-T
animal-INS-Ø
'an animal (INS)'

c. *buru-th-iy-a*
puɻu-ṯ-ki-a
gather-TH-fLOC-T
gather-Ø-IMMED-Ø
'is gathering'

d. *yarbuth-iy-a*
jaɻpuṯ-ki-a
animal-fLOC-T
animal-EMP-Ø
'an animal (EMP)'

6.2.2 Common morphomes; different stratal diacritics

A slightly more complicated case is represented by the formal privative, fPRIV. Descending historically from a privative case marker, fPRIV now realises CASE:privative and {POLARITY:negative, TH-TAM:actual}.[6] However, as can be seen in (6.13), even when fPRIV attaches to stems ending in the same phonologically relevant string (in this case the final consonant /t̪/), the surface forms are not strictly comparable.

(6.13)	a.	*yarbu-yarriy-a* (**yarbuth-arriy-a*)	b.	*buru-th-arriy-a* (**buru--yarriy-a*)
		jaɻpujaria		puɻut̪aria
		jaɻput̪-wari-a		puɻu-t̪-wari-a
		animal-fPRIV-T		gather-TH-fPRIV-T
		animal-PRIV-Ø		gather-ø-NEG.ACT-Ø
		‘without an animal’		‘doesn’t gather’

The synchronic analysis in this case is that both CASE:privative and {POLARITY:negative, TH-TAM:actual} are realised as fPRIV, but that the former is realised as fPRIV with an associated stratal diactric ‘R’ and the latter as fPRIV with a stratal diacritic ‘D’. Recall from Chapters 3 and 4 that different stratal diacritics will attract different classes of phonological modifications to apply across the left boundary of a morph. As was emphasised in Ch.4, this analysis has the consequence for the realisational morphology (Ch.7) that it must furnish the phonology not only with an ordered string of suffixes to operate on, but also with stratal diacritics for those suffixes. In turn, a statement as to how an individual morphosyntactic feature is realised may need to indicate, in addition to

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[6] It also functions derivationally as a negative agentive nominaliser, cf Evans (1995a:456–57), and appears as one half of a ‘compound suffix’, cf §6.2.7.

which morphome is involved (such as fLOC or fPRIV), which stratal diacritic that morphome is associated with. These two different aspects of a morphosyntactic feature value's realisation — a morphome and its stratal diacritic — will capture formally two different axes of similarity and variation within the Kayardild inflectional system.

6.2.3 Allomorphy

A further complication arises when suffixes have developed allomorphy — that is, when the variation in their surface realisations extends beyond what can reasonably be modelled in terms of a unitary underlying phonological suffix plus different stratal diacritics. As was discussed in Ch.3, §3.13.9 even this level of variation exhibits significant regularities, and to address this some allomorphs were distinguished as being either **strong** or **weak**, where members of each class pattern similarly. Recall that in song, for example, only strong allomorphs are permitted (§3.15). In the spoken register though, the choice between strong and weak forms is another dimension along which the realisation of morphosyntactic feature values may vary. The conditions on the appearance of strong and weak allomorphs are complex and will not be repeated here (see Ch.3, §3.13.9 for an empirical description and Ch.4, §4.5 and Ch.7, §7.2.4.1 for formal analyses), however as an example, CASE:proprietive and A-TAM:future differ in (6.14a,b) respectively in terms of the usage of a strong and weak allomorph.

(6.14)	a.	*wuran-kuru-ntha-*	b.	*wuran-kuu-ntha-*
		wuɻan-kuɻu-in̪t̪a-ø		wuɻan-kuu-in̪t̪a-ø
		food-fPROP$_{(STRONG)}$-fOBL-T		food-fPROP$_{(WEAK)}$-fOBL-T
		'food-PROP-COMP-Ø'		'food-FUT-COMP-Ø'

This then is a third realisational component for a morphosyntactic feature value, in addition to a morphome and a stratal diacritic: the allomorphy feature [±weak].

6.2.4 On the term 'case'

In Evans (1995a), a particular notion of *case* plays a central role in the overall analysis of Kayardild inflection. Several morphosyntactic features which are analysed here as something other than CASE as analysed in Evans (1995a) as *functions* of *case morphemes*. In certain respects, Evans' *case morphemes* approximate the level of representation which is identified here as the morphome — for example the range of forms identified in Evans (1995a) as containing the *oblique case morpheme* comes close to those identified here are containing the formal oblique (fOBL) morphome. The primary difference relates to the treatment of the morphosyntactic feature TH-TAM, corresponding to Evans' *tense*. In Evans (1995a) *tense morphemes* are distinct from *case morphemes*, even though they often display strong formal resemblances. This section is divided into two parts. In §6.2.4.1 I argue that the core difference between the treatment of Kayardild inflection here and in Evans (1995a) is a matter of theoretical assumptions, rather than decisions of analysis *per se*. In §6.2.4.2 I review Evans' (1995a) basic division of inflection into *case* and *tense* on its own theoretical terms.

6.2.4.1 Case and the consequences of morpheme-based morphology in Evans (1995a)

In Evans' (1995a) analysis of Kayardild, *case* suffixes are understood to perform several different functions, as follows. In a *relational* function, a *case* suffix expresses a 'syntactic or semantic relation between a nominal argument and either the verb or the clause as a whole' (Evans 1995a:103). In an *adnominal* function, a *case* suffix expresses 'the relation of one NP to another' (1995a:103). In a *modal* function, a *case* suffix 'provid[es] information about the mood, tense and/or aspect of the clause' (1995a:108). In an *associating* function, a *case* suffix 'is used to associate NP arguments with their nominalized verbs' (1995a:111). Finally, a *case* suffix in a *complementising* function marks a range of properties of clauses as a whole. In the analysis of Kayardild presented here, these same functions of *case* will correspond to various morphosyntactic features and feature values, as summarised in (6.15).

(6.15)

Function of *case* (Evans 1995a)	Feature (:value)
Relational	CASE
Adnominal	CASE
Modal	A-TAM
Associating	A-TAM:continuous
Complementising	COMP

In the use it makes of *case*, the analysis of Kayardild inflection in Evans (1995a) is similar to that found in several other Australianist works dealing with similar phenomena appearing around the same time, notably Dench & Evans (1988), Dench (1995) and Austin (1995). Since Evans provides a careful articulation the arguments which underly this usage of *case*, it will be possible to review them here in some detail.

The grouping of disparate suffixal functions under the one label *case* in Evans (1995a) has two logical parts: the grouping itself, and the assignment of the label '*case*' as appropriate to that group. The intention now will be to argue that the fundamental impetus for that grouping together of *case* functions comes from theoretical assumptions rather than from the empirical data itself. As such, one of the most readily apparent differences between Evans' (1995a) analysis of inflection and the analysis presented here — the number of morphosyntatcic features used — reflects a difference in the choice of assumptions rather than a disagreement in analysis *per se*. After introducing the various functions of *case* in Kayardild, Evans states:

> 'A central theoretical question is whether these really should be treated as different functions of the same suffix (as assumed this far), or as distinct suffixes that happen to be homophonous?' (Evans 1995a: 117)

In fact, what Evans poses at this point is an analytical question more than a theoretical one. By virtue of how the question is framed, an answer is already presupposed to the central theoretical issue which divides the *case*-based analysis of Kayardild in Evans (1995a) from the analysis in this dissertation. That is, in adhering to a tradition of grammatical description in which morphology is assumed to be morpheme-based, Evans is presented with only two choices for the analysis of the facts of Kayardild inflection: (i) in terms of polyfunctionality, where a small set of morphemes each have many functions; or (ii) in terms of homophony, where a larger set of morphemes each have fewer functions but are (accidentally) similar in form. For reasons which will be reviewed in §6.2.4.2, Evans advocates a polyfunctionality analysis of *case*.

Under the non-morphemic view of morphology adopted here, it is not necessary to chose between polyfunctionality and homophony, and hence the analytic dilemma does not arise, which leads Evans to group many functions under *case*. On the theoretical assumptions adopted here, distinct feature values can be realised similarly or dissimilarly, without any requirement that they be treated them as ‘the same’ suffix or otherwise. The facts of whether, to what extent, and in what manner different feature values are realised similarly is turned over to principles of realisation, which are expressed in terms of morphomes, stratal diacritics, allomorphy, phonological modifications and so forth. Likewise, any semantic or functional affinities between feature values can be represented by redundancy rules (cf Ch.3, §3.2).[7]

6.2.4.2 A critique of Evans (1995a) on its own terms

In order to assess the merits of the analysis of Kayardild inflection presented in this dissertation, it will be useful to have at hand a critique of Evans’ (1995a) analysis taken on its own terms. In addition to that comparative goal, it will be informative to establish some of the strengths and limitations of the analysis in Evans (1995a), given its place (i) as something of an exemplar in the analysis of related phenomena in Australian languages; and (ii) as currently the primary point of access to the highly complicated facts of Kayardild, a language which occupies a prominent place in the typological literature, and in theoretical literature which is based upon it.

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[7] The issue of diachronic relationships between functions of suffixes, and questions regarding the extent to which synchronic relationships are accidental or the result of diachronically principled developments, are not taken up here; see however Evans (1995a:407–12,542–49).

Let us begin with a review of the reasons cited for grouping together the various functions of *case*. The reasons behind the choice of '*case*' as a label will be returned to later.

Three principal factors are cited by Evans (1995a:118–19) as motivations for a polyfunctional analysis of *case*: (i) shared, distinctive allomorphy across the various *case* functions; (ii) shared morphological sequencing restrictions; and (iii) a level of semantic (in)coherence comparable with other case systems. The discussion to follow will focus mostly on point (i); points (ii) and (iii) are returned to towards the end.

Evans states that *case* suffixes 'have the same form and range of allomorphy regardless of their function' (1995a:118).[8] This statement provides a reasonable approximation of the facts to which it refers, but as an observation on which an analysis will hinge, it obscures certain significant points. The key facts abstracted away from are: (i) that the allomorphy of the *ablative case morpheme* is different when it takes a *modal* function in *precondition* clauses, compared with other functions and other environments (Evans 1995a:261); and (ii) that the allomorphy of the *proprietive case morpheme* is not the same in its *modal* function as in its *relational* and *adnominal* functions generally (Evans 1995a:145). As a consequence, in these two instances the unitary *case* suffixes which are posited possess not only various functions (e.g. *relational* function, *modal* function, etc.), but also a degree of function-dependent formal variation. In this respect,

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[8] The sentence continues, 'except for variations resulting from exposed vs internal position, which are clearly derivative' — these variations are a separate matter from what is being discussed here, and I would agree with Evans that they are derivative; they are the forms analysed in Ch.3, §3.7.2 as cumulative T forms (e.g. fALL.T /ɻi/).

the *case*-based analysis of Kayardild inflection stretches morphemic theory considerably, by positing unitary morphemes which possess specific, different forms for specific, different functions — something which under other circumstances would motivate an analysis in terms of multiple morphemes.

Let us next consider the relationship between *case* and *tense*. *Tense* does not feature in the arguments advanced by Evans for the unity of *case* morphemes (1995a:117–19), but the topic is broached later (1995a:255), at which point an analysis is considered and rejected in which *tense* is unified with *case*. Two broad issues are at play. First, there is sufficient *prima facie* resemblance between *tense* and *case morphemes* that they conceivably could be unified, and second, there are reasons offered by Evans why this move ought not to be made. The three reasons cited each relate to difficulties which would arise in the unifying of certain *tense morphemes* with a corresponding *case morpheme*, due to a lack of one-to-one correspondence between *tense* and *case*, and a lack of semantic similarity. First, Evans points out that not every *tense* suffix can be related (either historically, or formally at the synchronic level) to a *case* suffix. Second, there is a one-to-many realtionship between the *consequential case morpheme* and the formally related, yet formally and functionally distinct, *precondition tense* and *past tense morphemes*.[9] Third, Evans remarks generally that 'the meanings of the verb inflections are

[9] In terms of morphomes, the *consequential case* is realised by the strong allomorph /ŋarpa/ of fCONS, the *past tense* by the weak allomorph /ŋara/ and the *precondition tense* by the strong.

sometimes difficult to relate synchronically' to the meanings of *case* (1995a:255). Let us evaluate these claims in turn.

In general, Evans' objections to unifying *tense* and *case* will only go through if the bar is set higher for the unifying of *tense* and *case* than it is for the unifying of the various functions of *case*.

The first point was that *tense morphemes* exist which lack a corresponding *case morpheme*. In fact, every function of *case* contains at least one member which fails to appear in some other function,[10] and several *case morphemes* have one function only.[11]

The second point concerned the problem of one-to-many correspondences. Once again, the problematic correspondence already exists amongst *case* functions. The *ablative case* has several functions, and in the *modal* function it has two different allomorphs which correspond to two different uses, one in *precondition* clauses and one *past* clauses (Evans 1995a:260–61). Those two forms and uses in the *modal* function correspond to just one form and use in the *relational* function and in the *adnominal* function.

Finally, Evans' semantic argument is difficult to sustain. Both *tense* and the *modal* function of *case* relate to the semantic field of tense, aspect and mood, and thus these affinities are actually closer than those between *modal case*, *relational case* (which

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[10] For example, there is no *adnominal oblique* corresponding to the *relational, modal, associating* and *complementising oblique*.

[11] The *instrumental* and *utilitive cases* function only *relationally*, as do all *verbalising cases*.

corresponds to a more tradition notion of 'case') and *complementising case* (which conveys, among other things, relations of subordination between clauses).[12]

In sum, if one accepts that *case* itself (a category which covers a variety of functions including the marking of tense/aspect/mood) should be treated in a unitary manner, then there is little if any motivation for holding *tense* apart from *case* in a morpheme-based analysis of Kayardild inflection. Moreover, the unitary treatment of *case* rests upon a significantly unorthodox use of the notion of the morpheme, in which a single morphemic unit possesses different forms corresponding to different functions.

To tie up some loose ends: the discussion above did not mention Evans' original point (ii) for grouping case together, pertaining to ordering restrictions on morphemes. Regarding these, see §6.2.9 below — although they do motivate a grouping together of the various functions of Kayardild *case*, they also motivate unifying *case* with *tense*.

Finally, let us return to the choice of the label '*case*'. Evans refers to a definition of case due to Mel'cuk (1986), which applies to all functions of *case* in Kayardild (strictly speaking, it applies to at least some uses of some *cases* in each function). Criterial are (i) that the phenomenon at issue displays concord (on which, see §6.3 below), and (ii) that it is used to distinguish types of syntactic dependency. Although *tense* conforms to criterion (i), it is not clear that it conforms to (ii). Arguably then, to the extent that other form- and function-based considerations are subordinate to it, Mel'cuk's definition of

[12] Regarding the semantic plausibility of grouping together the various functions of *case*, Evans refers to the fact that typologically speaking, case systems are often semantically much more heterogeneous than canonical descriptions of case might suggest: 'the case systems of most languages abound in such problematic polysemy' (1995a: 118).

case motivates the treatment of *case* and *tense* as distinct within a morpheme-based analysis Kayardild. At the same time though, this move would be accompanied by some unwelcome consequences. Specifically, if Mel'cuk's criteria are to serve as arbiters of last resort on the question what counts as *case*, then it would appear that *number* in Kayardild ought also to be a function of *case*, given that it meets both criteria (and given the extent to which form and function are set aside in the consideration of *case* and *tense*).

A reasonable conclusion appears to be this: in the face of a highly complex inflectional system, and one which is pervaded by total and partial similarities in both the form and functions of inflectional suffixes, Evans (1995a) provides an analysis of Kayardild which captures a large part of the complexities in the system. At the same time, the analysis falls short of expressing the synchronic relatedness of *case* and *tense*, and arguably takes considerable licence with some basic principles of morphemic theory, in which it is couched..

For the remainder of the chapter, the focus returns to the non-morphemic analysis of Kayardild.

6.2.5 On the place of thematic TH in the inflectional system

In chapter 3, we saw that Kayardild lexical stems fall into one of two word classes: **nominal**, and **verbal**. All verbal stems end in the thematic, TH. Correspondingly, all derivational suffixes that are associated with a following TH will derive verbal stems, and all derivational suffixes that are not associated with a following TH will derive nominal stems. When we turn to inflection, the role of TH is different.

Diachronically speaking, several modern Kayardild CASE suffixes derive from erstwhile verbs (Evans 1995a:180–83). Owing to their diachronic origins, these suffixes still end in a thematic, and they will be referred to here as **thematic** CASE suffixes. An example is the donative CASE marker /wu-c/, which derives historically from the verb *wuu-j-* /wuː-c-/ 'give', and is illustrated in (6.16).

(6.16)	*Waa-ju-*	*nga-da*	*ngum-ban-ju-*
	waː-c-kuu-ø	ŋaṯ-ta	ŋuŋ-paɲ-kuu-ø
	sing-TH-fPROP-T	1sg-T	2sg-fPOSS-fPROP-T
	sing-Ø-POT-Ø	1sg-Ø	2sg-Ø-FUT-Ø

[*kalangin-mu-ju-*	*wangarr-wu-ju-* DON].
kalaŋiɲ-wu-c-kuu-ø	waŋar-wu-c-kuu-ø
old-fDON-TH-fPROP-T	song-fDON-TH-fPROP-T
old-DON-Ø-POT-Ø	song-DON-Ø-POT-Ø

'I'll sing you an old song.' [E337.ex.9-100]

As Evans (1995a:166–68) has demonstrated, suffixes such as CASE:donative are true nominal inflections and have long since lost their original status as verbs. In (6.16) for example the inflectional, as opposed to derivational, status of CASE:donative can be seen in the fact that it attaches to every word in its DP 'old song'. As a consequence of this, it must be recognised that suffixing a nominal lexical stem with an *inflectional* suffix that ends in TH is quite different to suffixing it with a derivational suffix ending in TH: the inflectional suffix does not alter the syntactic word class of the stem, whereas the derivational suffix does. Within the overarching picture of Kayardild morphology which we are building up, this is nothing unexpected — many of the formal elements from which Kayardild words are built serve multiple purposes; just like many other elements, the Kayardild thematic TH is associated with different properties when it functions derivationally and inflectionally.

Inflectional TH lacks the class-changing properties of derivational TH, but this does not mean that its presence at the end of an inflectional suffix is without consequences. On the analysis of Kayardild inflection advanced here most words within a VP will be associated morphosyntactically with three particular morphosyntactic features, of which at most two can be overtly realised in a given word form; which of them receives overt realisation will depend crucially on TH as follows.

Most clauses in Kayardild are associated with the two features: THEMATIC TENSE/ASPECT/MOOD (TH-TAM); and ATHEMATIC TENSE/ASPECT/MOOD (A-TAM). Some clauses also associate with a third feature, NEGATIVE. For reasons discussed in §6.4.4 below, most words in the VP of a clause will also become associated with these features. A fact of Kayardild realisational morphology, however, is that single word can only be *overtly* inflected for the NEG and TH-TAM (and not A-TAM) features, or for the A-TAM (and not NEG/TH-TAM) features associated with a given clause. Which features are realised (by overt suffixes) is matter sensitive to the *morphomic* representation of the base to which the suffixes attach. That is to say, much like inflectional suffixes can be sensitive to phonological or to morphosyntactic properties of the base to which they attach, in Kayardild NEG, TH-TAM and A-TAM are sensitive to its morphomic properties. Exactly how this sensitivity should be formalised will be discussed in Ch.7. For the moment though, the empirical facts are these: if the morphomic base ends in TH, then TH-TAM is realised (and NEG too, if the clause is associated with it); otherwise A-TAM is realised. Whether the crucial

TH morphome is part of a lexical stem of part of a CASE suffix is immaterial. Some examples now follow.

In (6.17) there are four words in the VP. The features values associated with the clause are {+NEG, TH-TAM:potential, A-TAM:future}, and all four words in the VP are also associated with those features. As always though, a given word cannot overtly inflect for both the NEG/TH-TAM features and the A-TAM feature associated with the same clause. Within the VP are a verb, a CASE:Ø DP and a CASE:dative DP. Both the lexical verbal stem and the morphomic realisation of CASE:dative (which is fDAT-TH) end in TH, and consequently the verb and the words in the CASE:dative DP get overtly inflected for {+NEG, TH-TAM:pot}. The word in the CASE:Ø DP gets overtly inflected for {A-TAM:fut}.

(6.17)	*Nga-da*	*waa--nang-ku-*	[*wangarr-u-* CASE:ø]
	ŋaṯ-ta	waː-c-naŋ-kuu-ø	waŋar-kuu
	1sg-T	sing-TH-fNEG-fPROP-T	song-fPROP-T
	1sg-Ø	sing-Ø-NEG-POT-Ø	song-FUT-Ø

[*ngij-in-maru--nang-ku-*	*thabuju-maru--nang-ku-* CASE:DAT]
ŋicu-iɲ-maɻu-ṯ-naŋ-kuu-ø	ṯapucu-maɻu-ṯ-naŋ-kuu-ø
1sg-fINY-fDAT-TH-fNEG-fPROP-T	e.brother-fDAT-TH-fNEG-fPROP-T
1sg-POSS-DAT-Ø-NEG-POT-Ø	e.brother-DAT-Ø-NEG-POT-Ø

‘I won’t sing a song for my brother’ [Evans 2003:215.ex.8b]

In (6.16) above, the clause was associated with {TH-TAM:pot, A-TAM:fut} (but not with a NEGATIVE feature). Words inflected for CASE:donative (realised morphomically as fDON-TH) were overtly inflected for {TH-TAM:pot}, as was the lexical verb stem, while the CASE:Ø direct object pronoun was inflected for {A-TAM:fut}. In (6.18) the clause is associated with {TH-TAM:actual, A-TAM:instantiated}, and so the lexical verb stem, and words in the DP inflected for the thematic, objective ablative CASE (OABL, realised morphomically as fOABL-TH) inflect overtly for {TH-TAM:act}, while the CASE:Ø direct object, 'animal', inflects for {A-TAM:ins}.

(6.18)	*Nga-da*	*yuu-da*	*bula-th*	*yarbuth-iy-a*
	ŋat̪-ta	juːt̪-ta	pula-t̪a	jaɻput̪-ki-a
	1sg-T	already-T	remove-TH.T	animal-fLOC-T
	1sg-Ø	already-ø	remove-ACT	animal-INS-Ø

[*ngij-in-mula-th*	*tharda-wula-th* OABL].
ŋicu-iɲ-wula-t̪a	t̪aʈa-wula-t̪a
1sg-fPOSS-fOABL-TH.T	shoulder-fOABL-TH.T
1sg-Ø-OABL-ACT	shoulder -OABL-ACT

'I already brushed the insect off my shoulder.' [W1960]

This section can be concluded with two further remarks. In the discussion above, care was taken to describe the overt realisation of NEG/TH-TAM and A-TAM as being mutually incompatible if the features at issue are associated with the same clause. As a first point, it should be noted that this incompatibility does not follow from the morphomic restrictions on NEG/TH-TAM (which must be realised directly after TH), and A-TAM (which may not be realised directly after TH); rather it is an independent fact. If the morphomic restriction were all that mattered, then it would be possible in some cases to realise NEG/TH-TAM immediately after TH, and then realise the A-TAM feature associated with the same clause immediate after that — this would be possible because NEG/TH-TAM suffixes do not end in TH, and so would not, on morphomic grounds, prevent A-TAM from being realised. So: the incompatibility of NEG/TH-TAM and A-TAM is not derivable from their individual morphomic restrictions. A second point relates to embedded clauses. Later in the chapter we will encounter sentence structures in which clauses are embedded. At that point, it will be possible for words to inflect for both NEG/TH-TAM and A-TAM features, provided that the features are associated with different clauses. So: the incompatibility of NEG/TH-TAM and A-TAM is not an incompatibility of the features *per se*, but of the features when they are associated with the same clause.

6.2.6 Inflection does not change word class

As we saw in §6.2.5 just above, there are case suffixes in Kayardild which end in TH. In Evans' (1995a) analysis of Kayardild, and more recently in Evans & Nordlinger (2004), it is claimed these same suffixes — which Evans and Nordlinger term *verbal*(*ising*) *case* — change the morphological word class (but not the syntactic word class) of the nominal stem to which they attach, converting it to a morphological (but not syntactic) verbal. As such, it is claimed (i) that Kayardild permits a mismatch between two kinds of word class: a syntactic kind and a morphological kind; and (ii) that inflection in Kayardild may alter (morphological) word class, in contravention of the otherwise apparently universal property of inflection, that it does *not* induce changes in word class (e.g. Anderson 1982:586). This section draws attention to a key point of analysis of the thematic TH which appears to provide the initial motivation for Evans' and Nordlinger's interpretation of the Kayardild facts, and then turns to another inflectional suffix, which Evans and Nordlinger argue converts verbals into (morphological) nominals.

Arguably, Evans' and Nordlinger's analysis of *verbalising*/thematic CASE finds its initial motivation in a specific analysis of the status of the thematic TH. In Ch.3, §3.8.2 arguments were offered for the analysis of TH, not as part of NEG/TH-TAM suffixes, but as part of the base to which NEG/TH-TAM suffixes attach. On Evans' and Nordlinger's analysis of Kayardild though, this is not the case, rather TH is part of the NEG/TH-TAM suffix (which they refer to as *tense*). The consequences of the two analyses, for the decomposition of inflected words into their component parts, are summarised in (6.19).

(6.19) Analysis of TH within an inflected word, according to:
the present analysis; and Evans (1995a), Evans & Nordlinger (2004) (=EN)

		Form of stem(+CASE)+further inflection			
		Present analysis		EN	
Lexical stem	CASE inflection	Stem (+CASE)	A-TAM/ NEG/TH-TAM	Stem (+CASE)	*Modal case/ tense*
nominal	none	*st*	*-A*	*st*	*-M*
nominal	athematic	*st-ca*	*-A*	*st-ca*	*-M*
nominal	thematic	*st-ca*-TH	*-NT*	*st-ca*	-TH.*T*
verbal	none	*st*-TH	*-NT*	*st*	-TH.*T*

KEY
Lexical stem: *st*. Thematic: TH
Inflectional suffixes: *ca* = CASE; *A* = A-TAM;
NT = NEG/TH-TAM; *M* = *modal case*; TH.*T* = *tense.*

As can be seen in (6.19), under the present analysis, the presence of overt inflection for A-TAM or for NEG/TH-TAM depends on the morphomic shape of the base: whether or not it ends in TH. On Evans' and Nordlinger's analysis, the appearance of *modal case* (approximately the same as A-TAM) or of *tense* (NEG/TH-TAM) is not predictable from the form of the base, although for bare stems, the choice does follow from word class. Evans and Nordlinger then argue that something similar applies for CASE-inflected nominals: *modal case* appears on *morphologically nominal words* and *tense* appears on *morphologically verbal words*, and if this is so, then thematic/*verbalising* CASE suffixes must convert morphological nominals into morphological verbals (while leaving them *syntactically nominal*). This occurs even though the class-changing suffixes are inflectional, and even though morphological word class and syntactic word class in Kayardild will consequently fail to consistently align. As Evans and Nordlinger observe, this casts Kayardild as a typologically highly unusual language, perhaps the only language known to possesses this property.

The alternative analysis proposed here has the same empirical coverage as Evans' and Nordlinger's analysis, but it brings with it some additional advantages. For one, it dispenses with the need for positing contradictory morphological and syntactic word class, and it does not posit class-altering inflection. Also, although it builds crucially on a reanalysis of the status of TH, that reanalysis has already been as argued in Ch.3, §3.8.2 to be well motivated on independent grounds. Finally, as will be argued below, there are further simplifications in the overall Kayardild morphological system which will follow if the present analysis is adopted.

Let us turn now to another inflectional suffix, one which is analysed by Evans and Nordlinger as converting verbal words into (morphological) nominals. Morphomically speaking, the suffix at issue is the formal nominaliser (fN).

By way of background, the fN suffix is employed derivationally to convert verbal stems into nominals, as illustrated in (6.20).

(6.20)	a. *ngarii--n-da* ŋaɻiː-c-n-ta ‹come first-TH-fN›-T ‹first born›-ø 'first born'	b. *wathangi--n-da* wat̪aɲi-c-n-ta ‹lie on side-TH-fN›-T ‹baby able to roll itself over›-ø 'baby able to roll itself over'

Just as was argued in §6.2.5 to be the case for TH, the suffix fN will be taken here to behave differently when it is used derivationally (in which case it does always convert a verbal stem to a nominal), and when it is used inflectionally (in which case it does not). As before with TH, the diverse behaviour of fN is nothing unexpected — the morphomic elements of Kayardild morphology are regularly associated with multiple, different functions, including both derivation and inflection. Now back to inflectional fN.

In clauses which depict an ongoing, incomplete action, all verbal words in the clause are inflected with the formal marker fN, as are all nominal words inflected with thematic CASE. Nominal words in the same clauses which are inside the VP, and are not inflected for thematic CASE, are inflected with the formal oblique (fOBL). Example sentences are shown in (6.21) and (6.22). The word *thungalwulanda* in (6.22) is inflected for the thematic, objective ablative CASE.

(6.21)	*Nying-ka*	*kamburi--n-da*	*kang-inj-*	*bandika-waan-inj-.*
	ɲiŋ-ka	kampuɻi-c-n-ta	kaŋ-in̪t̪a-ø	pantika-waːɲ-in̪t̪a-ø
	2sg-T	speak-TH-fN-T	language-fOBL-T	Bentinck-fORIG-fOBL-T
	2sg-ø	speak-ø-PROG-ø	language-CONT-ø	Bentinck-ORIG-CONT-ø
	'You are speaking the Bentinck language.' [W1960]			

(6.22)	*Bi-rr-a*	*bula--n-da*	*thungal-wula--n-da*[13]	*kurda-nth.*
	pi-r-ta	pula-t̪-n-ta	t̪uŋal-wula-t̪-n-ta	kuʈa-in̪t̪a-ø
	2-du-T	remove-TH-fN-T	tree-fOABL-TH-fN-T	paperbark-fOBL-T
	2-du-Ø	remove-Ø-PROG-Ø	tree-OABL-Ø-PROG-Ø	paperbark-CONT-Ø

‘Those two are pulling paperbark off the trees.’ [E472.ex.11-27]

Evans’ and Nordlinger’s analysis of such clauses is (i) that fN functions as a (morphological) *nominaliser*, converting syntactically verbal words into *morphological nominals* (while leaving them syntactically verbal), as well as converting syntactically nominal, morphologically verbal words, such as *thungalwulanda* in (6.22), back into morphologically nominal words; and (ii) that fOBL functions as an *associating case* suffix, associating clausal dependents with a nominalised verb.[14] On that analysis, the morphology in a sentences like (6.23), with its *nominalisation* of verbal words and *associating case* on nominals, is significantly different from the morphology in a sentence like (6.24), with its *tense*/TH-TAM on verbal words and *modal case*/A-TAM on nominals.

[13] Evans’ original sentence has *thungalulanda* without *w*. On the phonetic facts related to [Lwu] sequences (for all liquids L) see Ch.2 §2.1.4.4.

[14] Clauses whose verbal head is inflected with fN are termed *nominalised clauses* by Evans (1995a), following common Australianist practice (Nordlinger 2002; see also Blake 1987:141–43). Nordingler reviews the typical properties of Australianists’ ‘nominalised clauses’ and concludes that ‘they are not nominalised in the usual sense of the word, but in an Australian-specific sense, where “nominalisation” refers not to the process of deriving a noun, but rather that of deriving a member of the superclass of nominals’ (2002:2). Here I will argue that the ‘nominalised clauses’ of Kayardild are not nominalised even in this Australianist-specific sense, rather they are normal clauses headed by verbs.

(6.23)	*Dangka-wala-da*	*kurri--n-da*	*bakii--n-da*	*wirrkan-inj-.*
	ʈaŋka-palat̪-ta	kuri-c-n-ta	paki:-c-n-ta	wirkan-in̪t̪a-ø
	person-fPL-T	watch-TH-fN-T	all do-TH-fN-T	corroboree-fOBL-T
	person-PL-Ø	watch-Ø-PROG-Ø	all do-Ø-PROG-Ø	corroboree-CONT-Ø

‘The people are all watching the corroboree.’ [W1960]

(6.24)	*Jungarra-wu-*	*wirrkan-ku-*	*kurri-j-u-*	*bakii-j-u-.*
	cuŋara-kuu-ø	wirkan-kuu-ø	kuri-c-kuu-ø	paki:-c-kuu-
	big-fPROP-T	corroboree-fPROP-T	watch-TH-fPROP-T	all do-TH-fPROP-T
	big-FUT-Ø	corroboree-FUT-Ø	watch-Ø-POT-Ø	all do-Ø-POT-Ø

‘(We) will all watch the big corroboree.’ [W1960]

The analysis here will be that the morphosyntax of a sentences like (6.23) and (6.24) is parallel; the only difference is the specific values of TH-TAM and A-TAM involved. That is, fN in (6.23) realises a TH-TAM value, which will be termed TH-TAM:progressive, and fOBL in (6.23) realises an A-TAM value, termed A-TAM:continuous. To offer support for this analysis, the next few paragraphs set out several behaviours of fN and fOBL in sentences such as (6.21)–(6.23) which directly parallel the behaviour of other TH-TAM and A-TAM suffixes, but which have no obvious explanation within Evans' and Nordlinger's heterogeneous account.

As a first point, in clauses like those in (6.21)–(6.23), words inflected with the fN suffix are not also inflected with an additional fOBL suffix. If fN is realises a TH-TAM value and fOBL an A-TAM value then this fact is follows automatically, given that no word ever inflects for both the TH-TAM value and the A-TAM value associated with the same clause. On the other hand, under Evans' and Nordlinger's account there is no motivation from other parts of the grammar, for why a *nominalised* verb should not inflect for *associating case*. Two possible counter arguments to this claim can be addressed as follows.

A first possible counter argument is that *associating case* is defined by Evans as *case* which 'associate[s] NP arguments with their nominalized verbs' (1995a: 111), and as such we should not expect it to be marked on the (syntactic) verb itself. This may be so, but consider the case of syntactic nominals, inflected with thematic/*verbalising* CASE and then with fN. These nominals occupy DPs which are arguments of the verb, yet they are not inflected with *associating case*. In fact, the distribution of *associating case* is quite complicated: *associating case* appears on words that are in the VP and which are both syntactically nominal *and* morphologically nominal. This places Evans' and Nordlinger's account of Kayardild in the awkward position not only of needing to posit a split between syntactic word class and morphological word class, but also of requiring that inflection be sensitive to both kinds of class at once.

A second possible counter argument is that a (morphologically) nominalised verb fails to inflect for *associating case* by virtue of a metageneralisation which holds over two different pairs of inflectional features: TH-TAM/A-TAM (i.e., *tense/modal case*) on the one hand and *nominalisation/associating case* on the other. That metageneralisation would state that a word within the VP can inflect for only one type in each pair. Such a metageneralisation is certainly feasible, but that fact that it could be set up does not successfully counter the claim made above, that the mutually exclusivity and *nominalisation/associating case* lacks motivation from elsewhere in the grammar. Establishing a metageneralisation merely shifts the locus of explanation, since one still needs to define the domain to which the generalisation applies, and no independent fact of Kayardild grammar will supply that definition.

Moving on, supposing that fN in the clauses under discussion really is a TH-TAM suffix as proposed here, then we might expect to find it appearing in other clause types in combination with an A-TAM value other than A-TAM:continuous, since in general there are often a number of distinct A-TAM values which a given TH-TAM value can pair with (cf §6.1.3 above). Indeed, on the analysis proposed here there is a second clause type whose TH-TAM value is TH-TAM:progressive, and whose A-TAM is value is something other than A-TAM:continuous, namely A-TAM:functional, realised by the formal utilitive (fUTIL) suffix. An example is shown in (6.25).

(6.25)	*Dathina*	*birndi~birndiy-*
	t̪at̪ina	piɳʈi-piɳʈi-a
	that.T	‹shell$_{NL}$-shell$_{NL}$›-T
	that	‹baler shell›-Ø

thungal-marra-	*kala--n-d-,*	*wumburu-marr-.*
t̪uŋal-mara-ø	kala-c-n-ta	wumpuɻuŋ-mara-ø
tree-fUTIL-T	cut-TH-fN-T	spear-fUTIL-T
tree-FUNC-Ø	cut-Ø-PROG-Ø	spear-FUNC-Ø

‘That baler shell is for cutting trees down, for making spears.’ [E161.ex.4-103; W1960] (lit. ‘That baler shell is for cutting trees and spears.’)

Evans (1995a: 161) concedes that the semantics of sentences such as (6.25) are suggestive of a structure in which the nominals marked by fUTIL are dependents of the verb marked by fN. However, based on the expectation that clauses with a *nominalised* verb ought to have dependents marked with *associating case* (1995a: 162), Evans opts for a multiple-predicate analysis along the lines shown in (6.26), in which fUTIL realises CASE:utilitive — e.g., in which *thungalmarra* as ‘tree-UTIL’ literally means ‘for trees’.

(6.26) *Dathina birndibirndiy* [*thungalmarra* NP] [*kaland* NP] [*wumburumarr* NP].
'That baler shell is for trees, for cutting, for spears.'

A problem for the analysis in (6.26) though is the form of the verb: there are no other circumstances under which a nominalised active verb in Kayardild means 'for V-ing'. Given that, the compositional, multiple-predicate analysis of (6.26) will not stand without further elaboration. The nearest verb form to what the compositional analysis requires in order to be sound, is a nominalised middle verb which can denote 'implement used for V-ing'. That is to say, a compositional, multiple-predicate analysis is appropriate for sentences such as (6.27), but not for (6.25/6.26).

(6.27) *Wuran-marra-* *karnaa---n-d.*
wuɻan-mara-ø kaɳa-i-c-n-ta
food-fUTIL-T roast-fMID-TH-fN-T
food-UTIL-Ø roast-MID-Ø-N-Ø
'(That wood) is for food, is used for roasting.' [R2005-jul22]

To return to the leitmotif of the discussion: in a sentence such as (6.25), fN can be interpreted as a TH-TAM marker, and fUTIL as an A-TAM marker. Under that analysis, we account for the use of an active rather than a middle verb, and also for why the verb does not take a further fUTIL inflection — because no word ever inflects for both the TH-TAM and the A-TAM feature associated with the same clause.

In sum, Evans' (1995a) and Evans & Nordlinger's (2004) analysis of '*verbalising*' thematic CASE suffixes loses what appears to be its initial motivation once the thematic TH is analysed as part of the base to which a NEG/TH-TAM suffix attaches rather than part of the suffix itself (and independent support for this analysis was adduced in Ch.3, §3.8.2). Furthermore the analysis of several 'special' clause types can be unified with that of other, 'normal' types if is it assumed (i) that inflectional fN in sentences such as (6.21) realises TH-TAM:progressive rather than *nominalisation*; (ii) that inflectional fOBL in sentences like (6.21) realises A-TAM:continuous rather than *associating case*; and (iii) that inflectional fUTIL in sentences like (6.25) realises A-TAM:functional rather than CASE:utilitive. In turn, the analysis proposed here obviates the need to invoke a mismatch between morphological word class and syntactic word class; avoids positing inflections which are sensitive to both of the latter; and avoids positing typologically unusual, if not unique, word class altering inflectional morphology.

6.2.7 Compound suffixes in inflection

In Ch.3, §3.12.8 a **compound suffix** was introduced as being a string comprised of two suffixal morphs *a+b*, which has a unitary, non-compositional function, different to that of *a* or *b* used alone. In the Kayardild inflectional system there are two values of the TH-TAM feature which are realised by complex suffixes, both of which consist formally of the formal nominaliser (fN) followed by another element. What I term the 'nonveridical' TH-TAM value is realised by fN-fPRIV (where fPRIV is the formal privative) and the 'antecedent' value is realised by fN-fCONS (where fCONS is the formal consequential). Example sentences are shown in (6.28) and (6.29).

(6.28)	*Nga-da*	*kurri--n-marri-*	*dathin-ki-*	*bijarrba-y-.*
	ŋat̪-ta	kuri-c-n-wari-a	t̪at̪in-ki-a	picarpa-ki-a
	1sg-T	see-TH-‹fN-fPRIV›-T	that-fLOC-T	dugong-fLOC-T
	1sg-Ø	see-Ø-‹NONVER›-Ø	that-INS-Ø	dugong-INS-Ø

‘I didn’t see that dugong.’ [E374.ex.9-237]

(6.29)	*Niy-a*	*wa-yii-j,*
	ɲ̪i-a	waː-i-ca
	3sg-T	sing-fMID-TH.T
	3sg-Ø	sing-MID-ACT

dangka-ngarrba-	*bala-n-ngarrba-*	*dana-n-ngarrb-*
t̪aŋka-ŋarpa-	pala-t̪-n-ŋarpa-	t̪ana-t̪-n-ŋarpa-
person-fCONS-T	kill-TH-‹fN-fCONS›-T	leave-TH-‹fN-fCONS›-T
person-ANTE-Ø	kill-Ø-‹ANTE›-Ø	leave-Ø-‹ANTE›-Ø

‘He sings to himself, having killed a man and left.’ [R2005-jun29]

Note that in neither instance could we analyse the appearance of fN as being automatically triggered by the presence of fPRIV or fCONS, since other TH-TAM values exist which are realised solely by fPRIV or fCONS without fN, as shown in (6.30). Likewise, neither the appearance of fPRIV or of fCONS is automatically triggered by the presence of fN, since as we saw in §6.2.6 above, fN realises the progressive value of TH-TAM on its own, without the concomitant appearance of fPRIV or fCONS.

(6.30)	a.	*kala-th-arriy-a*	b.	*kala-th-arrba-*
		kala-t̪-wari-a		kala-t̪-ŋarpa-a
		cut-TH-fPRIV-T		cut-TH-fCONS-T
		cut-ø-NEG.ACT-ø		cut-ø-PRECON-ø
		‘doesn’t cut’		‘having cut’

Given the discussion in §6.2.6 regarding *nominalised verbs* in Evans (1995a), some comment is in order on the status of the compound suffixes fN-fPRIV and fN-fCONS as realisations of TH-TAM values.[15] As in §6.2.6, the matter can be approached by examining the workings of both TH-TAM and A-TAM in the clause.

All TH-TAM values are compatible only with certain A-TAM values in association with a given VP (cf §6.1.3). If fN-fPRIV and fN-fCONS do realise TH-TAM values, then we would expect them to be compatible only with certain A-TAM values; if they do not, then we would not expect this, and would need to independently stipulate the fact if it is true. Indeed, such restrictions are observed. The nonveridical TH-TAM value is compatible with the prior A-TAM value, the negatory A-TAM value,[16] or with the instantiated value shown in (6.28). Antecedent TH-TAM is only compatible only with the antecedent A-TAM value.[17]

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[15] Evans (1995a) analyses these clauses as containing *verbs* that are *nominalised* then inflected for *privative case* (corresponding to my nonveridical) or *consequential case* (my antecedent) (Evans 1995a: 470–76, 80–83). *Associating case* fails to appear in these clauses, and although the fact is tabulated by Evans (1995a: 470, figure.11-5), its absence is neither accounted for nor related to the earlier comment that *associating case* is 'used to associate NP arguments with their nominalized verbs' (1995a: 111).

[16] Such clauses are termed *double privatives* by Evans (1995a: 376). An example is:

(a)	*Nying-ka*	*tharda-warriy-a*	*buru-n-marri-*	*ngijin-marriy-a*
	ɲiŋ-ka	t̪aʈa-wari-a	puɻu-t̪-n-wari-a	ŋicin-wari-a
	2sg-T	arm-fPRIV-T	hold-TH-‹fN-fPRIV›-T	1sg.fPOSS-fPRIV-T
	2sg-Ø	arm-NEGAT-Ø	hold-Ø-‹NONVER›-Ø	1sg-NEGAT-Ø

Moreover, just like other TH-TAM values, nonveridical and antecedent are realised on all verbs in a clause, as on the serialised verbs 'kill leave' in (6.29) above, and after thematic case suffixes, such as the dative in (6.31) below. Again, if fN-fPRIV and fN-fCONS are not realised as exponents of TH-TAM, this must be independently stipulated.[18] The simplest analysis is that fN-fPRIV and fN-fCONS do realise TH-TAM values.

(6.31)	*Kinaa-n-marriy-a*	*dangka-wala-da*	*ngij-in-maru-n-marri-.*
	kinaː-c-n-wari-a	ʈaŋka-palat̪-ta	ŋicu-iɲ-maɻu-t̪-n-wari-a
	show-TH-‹fN-fPRIV›-T	person-fPL-T	1sg-fPOSS-fDAT-TH-‹fN-fPRIV›-T
	show-Ø-‹NONVER›-Ø	person-PL-Ø	1sg-Ø-DAT-Ø-‹NONVER›-Ø
	'The people didn't show me.' [W1960]		

6.2.8 Ligative fLOC in the inflectional system

Similar in appearance, but different in detail, to compound suffixes are sequences of the formal ablative (fABL) or formal allative (fALL) preceded by the formal locative (fLOC) in a

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nying-ka	*barji-j-arr.*
ɲiŋ-ka	paɻci-c-ŋara-ø
2sg-T	fall-TH-fCONS-T
2sg-Ø	fall-Ø-PST-Ø
'If you hadn't held my arm you would have fallen.' [W1960]	

[17] In contrast to TH-TAM:antecedent which is realised by fN-fCONS, A-TAM:antecedent is realised by fCONS alone.

[18] Note it will not be enough to stipulate that within a clause, all verbals and all nominals inflected for *verbalising case* must be *nominalised* together, since it is still necessary to account for the concordial appearance of fPRIV or fCONS after each instance of fN.

ligative function (on ligative suffixes in general, cf Ch.3, §3.12.8).[19] Examples are shown in (6.32).

(6.32)	a.	*dathin-ki-na-*		b.	*dathin-ki-ri*
		ʈat̪in-ki-naa-			ʈat̪in-ki-ɻi
		that-fLOC-fABL-T			that-fLOC-fALL.T
		that-Ø-ABL-T	‘from that’		that-Ø-ALL ‘to that’
		that-Ø-PRIOR-T	‘that (PRIOR)’		that-Ø-DIR ‘that (DIR)’

In all cases, the appearance of the fLOC can be seen as an automatic response to the formal presence of either the fABL or the /ɻiŋ/ allomorph of the fALL: neither of the latter ever appear without being preceded (underlyingly) by fLOC.

6.2.9 Sequencing restrictions on morphomes

As Evans (1995a:105–7) demonstrates, there are several aspects of Kayardild inflection which are best analysed in terms of restrictions on the linear sequencing of the realisations of inflectional categories. Stated in terms of the current analysis, there are ordering restrictions on certain morphomes. Specifically, as realisations of morphosyntactic

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[19] Dixon (1980: Ch.10) and Schweiger (2000: 256) have both noted that the realisations of ‘local’ cases like allative and ablative are often segmentable into two parts in Australian languages. Of course, in the case of Kayardild we should beware of confounding labels with actual functions: in modern Kayardild the signalling of local semantics is a minor to near-unattested function of the fLOC, fABL and fALL suffixes. It would be more appropriate to compare the typical Australian situation with proto-Tangkic, from which Kayardild has descended.

features, the formal desiderative (fDES), formal locative (fLOC)[20] and formal oblique (fOBL) can only appear last in a word (except for the termination, T). How this restriction is obeyed varies from case to case. The fDES simply blocks any expected morphome to its right from being realised; the fLOC fails to be realised if it would be followed by the realisation of another morphome, and the fOBL shifts its linear position to the right edge of the word. Lastly, there is a suppletive, cumulative morph /kurka/ which realises both fLOC and fOBL, thereby allowing both morphomes to simultaneously be realised 'last in the word'. These and related patterns are examined further, and formalised in Ch.7, §7.2.5.

6.3 Concord

The most central empirical attribute of Kayardild inflection, and the most striking, is the phenomenon which I will term **concord**.[21] Concord is defined in (6.33) and a simple example follows in (6.34).

[20] If fLOC functions as a ligative suffix (cf §6.2.8), the ban does not apply.

[21] 'Concord' in this sense has been used by Klokeid (1976) with respect to Lardil, Dench and Evans (1988) with respect to case marking in Australian languages in general, Evans (1995a) with respect to Kayardild, and Plank (1995) with respect to *Suffixaufnahme* in general. See also Evans (2003) for a comparative-theoretical discussion of his analysis of Kayardild in relation to notions of concord, agreement and government.

(6.33) Concord

The morphological realisation, on multiple words dominated by a syntactic node *N*, of a morphosyntactic feature value associated with *N*.

The example in (6.34) shows a DP, ending with *thungalu* 'thing' and associated with CASE:proprietive, which in turn contains an embedded DP ending with *dangkanabawu* 'man' and associated with CASE:ablative.

(6.34)	[DP [DP *balarr-i-naba-wu-*	*dangka--naba-wu-* ABL]	*thungal-u-* PROP]
	palar-ki-napa-kuu-ø	ʈaŋka-ki-napa-kuu-ø	ʈ̪uŋal-kuu-ø
	white-fLOC-fABL-fPROP-T	man-fLOC-fABL-fPROP-T	thing-fPROP-T
	white-Ø-ABL-PROP-Ø	man-Ø-ABL-PROP-Ø	thing-PROP-Ø

'having a white man's thing (i.e., a tape recorder)' [R2005-jul21]

All three words in (6.34) are dominated by the matrix DP node, and all three inflect for CASE:proprietive; words within the subordinate DP are dominated by both the matrix and the subordinate nodes and are inflected for both CASE:ablative and CASE:proprietive. What (6.34) illustrates is in fact a particular kind of concord which I will term **complete concord**, defined in (6.35).

(6.35) Complete concord

The morphological realisation, on all words dominated by a syntactic node *N*, of a morphosyntactic feature value associated with *N*.

In the description of Kayardild it will be useful to contrast complete concord with **conditioned concord** defined in (6.36).

(6.36) Conditioned concord

The morphological realisation of a morphosyntactic feature value F:V, associated with a syntactic node *N*, on all words which (i) are dominated by a syntactic node *N* and (ii) whose stems are morphologically able to inflect for F:V.

A more involved example of concord is shown in (6.37).

(6.37) *Nga-da* *mungurru-,* [$_{\text{S}}$ *maku-ntha-* [$_{\text{VP}}$ *yalawu-j-arra-ntha-*
ŋat̪-ta muŋuru-a maku-in̪t̪a-ø jalawu-c-ŋara-in̪t̪a-ø
1sg-T know-T woman-fOBL-T catch-TH-fCONS-fOBL-T
1sg-Ø know-Ø woman-COMP-Ø catch-Ø-PST-COMP-Ø

yakuri--naa-ntha- [$_{\text{DP}}$ [$_{\text{DP}}$ *thabuju-karra*[22]*-nguni--naa-ntha-* $_{\text{GEN}}$]
jakuɻi-ki-naa-in̪t̪a-ø t̪apucu-karaɲ-ŋuni-ki-naa-in̪t̪a-ø
fish-fLOC-fABL-fOBL-T brother-fGEN-fINST-fLOC-fABL-fOBL-T
fish-Ø-PRIOR-COMP-Ø brother-GEN-INST-Ø-PRIOR-COMP-Ø

mijil-nguni--naa-nth- $_{\text{INST}}$] $_{\text{PRIOR, PST}}$] $_{\text{COMP}}$]
micil-ŋuni-ki-naa-in̪t̪a-ø
net-fINST-fLOC-fABL-fOBL-T
net-INST-Ø-PRIOR-COMP-Ø
'I know that the woman caught the fish with brother's net.' [E5.ex.1-16]

In (6.37) the subordinate clause complement of *mungurru* 'know' is bracketed as [$_{\text{S}}$ ... $_{\text{COMP}}$]. The subscripted 'S' on the left bracket indicates that the constituent is of type S (a clause) and 'COMP' on the right bracket (last in the sentence) indicates the morphosyntactic feature value associated with the clause, COMP:plain (glossed COMP). The COMP:plain feature exhibits complete concord within the clause. The verb phrase (VP)

[22] A small note: sentence (6.37) is probably the most widely published sentence in the Kayardild language. The word *thabujukarra(n)nguninaantha* is cited without the bracketed *n*. The absence of surface [n] at the end of the genitive suffix is unexpected given what is otherwise known about Kayardild phonology and morphology. Evans (1995a) does not comment the form (though on his analysis of the genitive suffix, the [n] is expected). The absence of [n] may result from an early transcription error, or it may be that fGEN has a genuine allomorph lacking underlying /ɲ/ which appears before some unknown set of other suffixes. I am unaware of any audio recording of sentence (6.37), nor do I have a recording of any other word containing a sequence of -fGEN-fINST-. In the absence of disconfirming primary data, my analysis of fGEN in this dissertation will overlook the lack of the surface [n] in (6.37).

within that same clause is associated with TH-TAM:past and A-TAM:prior. Both these feature values exhibit conditioned concord — A-TAM:prior is marked on all stems in VP which do not end in the thematic TH, and TH-TAM:past is marked on all stems in VP which do end in TH. The sentence ends with the embedded DP structure '[$_{DP}$[$_{DP}$ brother's $_{GEN}$] net $_{INST}$]' in which the CASE features of both DPs exhibit complete concord. As a result of all this, the most embedded word of all, *thabujukarranguninaatha* 'brother', is marked for its own CASE:genitive, for CASE:instrumental, for A-TAM:prior and for COMP:plain.

Example (6.37) offers a good illustration of the inflectional complexity of individual words that can arise due to concord, but it does not on its own provide much of an indication of the complexities which exist within the Kayardild system of concord itself. The remainder of Ch.6 is devoted to an examination of those complexities, and to their analysis.

6.4 Surface syntax, non-surface syntax, and concord

Section 6.4 provides an initial introduction to the issues, and to approaches to them, which will be expanded on through the remainder of the chapter, and is structured as follows: §6.4.1 presents a brief synopsis of the syntax of the Kayardild clause, §6.4.2 introduces the notion of a 'non-surface syntactic' structure and its place in an account of Kayardild inflection, §6.4.3 relates that structure to specific facts regarding inflectional domains in Kayardild, §6.4.4 sketches the mechanism by which non-surface syntax is assumed to mediate the assignment of morphosyntactic features to words in Kayardild, §6.4.5 presents the specific form of the non-surface clause, and of the DP, §6.4.6

comments on the linear order of features' realisation in the word, §6.4.7 offers a short comparison of the approach adopted here with some recent research in generative grammar, and §6.4.8 introduces the syntactic word classes of Kayardild.

6.4.1 Kayardild syntax, briefly

The main predicate of a Kayardild clause is either a single verb, or less commonly, a 'complex' of verbs, or a predicate DP; occasionally a verb of transfer or movement is elided if its meaning is recoverable from context. Verbs can take a syntactic complement DP, or not, and they may also subcategorise for various non-complement arguments. The complement DP can be promoted to subject in passive clauses and can be syntactically topicalised. It can also be syntactically focalised, as can the subject DP. Word order within DPs is fixed, but the order of verbs and DPs within the clause is free, to the extent that almost any order is possible, even if not equally likely or appropriate in all contexts. The word order of particles is much more constrained, and is defined in terms of the edges of other surface-syntactic constituents. DPs are freely elided when their reference is recoverable from context. Also, it is not uncommon for multiple, identically inflected DPs to be juxtaposed in a single clause: DP juxtaposition has several functions, including apposition, conjunction and disjunction. A rich array of embedded structures is attested. DPs can contain embedded DPs or embedded VPs as modifiers, and predicate DPs can take full embedded clauses as complements. Clauses themselves can contain embedded 'motion purpose' VP adjuncts and main verbs can take embedded clause complements.

6.4.2 Non-surface syntax in the account of inflection

Because DPs and verbs are freely ordered within the clause, there is no constituent in the clause which is both larger than the DP and consistently contiguous, other than the clause itself. However, the central claim of the remainder of this chapter is this: morphosyntactic features in Kayardild are always realised within sets of words which relate to one another in a strict, hierarchically embedded fashion. Discontinuity on the surface masks an often intricately embedded underlying order.

If we refer to the set of words on which a morphosyntactic feature is realised as that feature's **domain** (Dench & Evans 1988), then the domains of features in Kayardild relate to one another precisely like hierarchically embedded syntactic constituents. Moreover, these constituents are not random assemblages of words. Despite the fact that there is no evidence from surface word order for constituents such as VP (Evans 1995a: 120–21,534), the inflectional domains of Kayardild appear distinctly similar to domains such as VP, S, DP and NP, which can be detected on the basis of word order in many other languages.

It makes sense then, to speak of a 'non-surface syntactic' structure in Kayardild, with respect to which all Kayardild inflectional features exhibit either complete or conditioned concord within some or other constituent. The relationship between non-surface syntax and surface syntax appears to be something like scrambling. I will have more to say regarding this relationship in §6.9.

6.4.3 Embedded domains

Let us define the notation **D**(*x*) as follows: (i) **D**(F:V) stands for the domain of a feature value F:V; (ii) **D**(F) stands for the domain of all of the values of F (in the case that they all coincide); and (iii) **D**(F,G) stands for the domains of all of the values of feature F and of feature G (in the case that they all coincide). Let the statement **D**(G) ⊃ **D**(F) express the fact that all of the constituent types which occur in the domain of F also occur in the domain of G, but not *vice versa*. Now, the following relationships can be observed to hold in Kayardild:

(6.38) Embedding of Kayardild feature domains

a. **D**(COMP:empathy) ⊃ **D**(COMP:plain) ⊃ **D**(A-TAM:*x*) ⊃ **D**(A-TAM:*y*) ⊃ **D**(A-TAM:*z*),
where:
x = continuous*
y = emotive, future, present, prior*
z = directed, instantiated

b. **D**(CASE, NUMBER**) ⊃ **D**(NUMBER**)

*possibly also antecedent, negatory, precondition, functional
**NUMBER has two possible concordial domains, cf §6.6.6.

6.4.4 Feature attachment and percolation in non-surface syntax

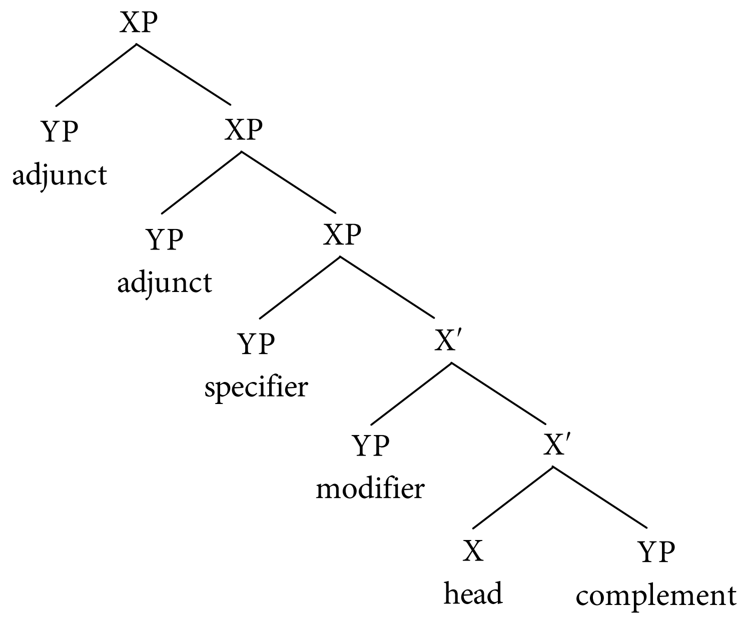
On the account proposed here, the embedded domains of (6.38) correspond to embedded, contiguous constituents in non-surface syntax (see §6.4.5 next for specifics). To account for the distributions of inflectional features across the words of a clause, it is proposed that morphosyntactic feature values each attach to a specific syntactic node, and from there percolate downward to all nodes below and eventually to individual words (this mechanism will be fleshed out further in §6.7 below). As such, it will be useful to distinguish between the initial **attachment** of a feature to a node, before percolation takes place, and the eventual **association** of a feature with potentially many nodes, and words. Note that under this model, if features F and G attach to nodes N_F and N_G respectively, and N_F is dominated by N_G, then it follows that $\mathbf{D}(G) \supset \mathbf{D}(F)$.

For reasons which will become clear in §6.5.2, a special status must be accorded to S nodes. S nodes can associate with only one feature, which if anything will be a COMPLEMENTISATION feature. This in turn means that S nodes present an opaque barrier, across which no other features can percolate.

6.4.5 Non-surface syntactic structures

I will assume that non-surface syntactic structures conform to the general X-bar schema shown in (6.39). This analysis is chosen partly in order for the generalisations made here to remain accessible to a wide range of syntactic theories, but also because the structure provides a good fit with the data.

(6.39)



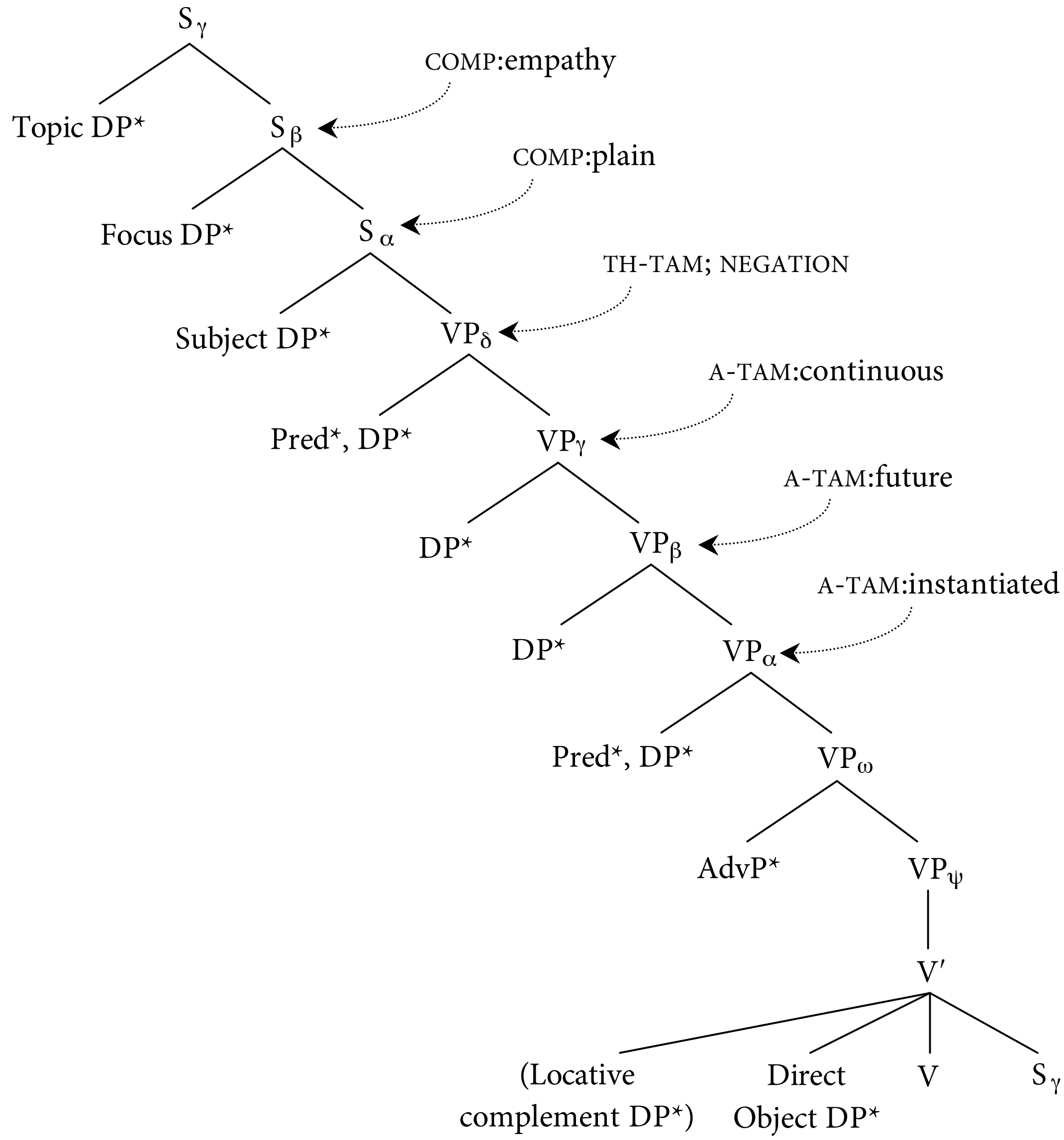
Something of an exception to the general X-bar structure of (6.39) is the clause node, S. S acts partially like an XP node (in that any YP which is both daughter to and sister of S is an adjunct), but its immediate constituents are the subject DP and VP (see (6.40) below).

For two reasons, I do not assume branching to be binary. First, since DP juxtaposition is not uncommon, and since there is no evidence (from inflection) of internal hierarchical structure among juxtaposed DPs, it is appropriate to treat all juxtaposed DPs as sisters. As a consequence, if a given XP permits one DP daughter, then it will also permit multiple, juxtaposed DP daughters. Second, we will encounter large classes of clausal adjunct DPs, all of which exhibit identical inflectional properties. Even though these are not necessarily juxtaposed, their inflectional behaviour is indistinct from that of true juxtaposed DPs and their analysis in terms of non-surface syntax will be the same, that is, they will be sisters under a common mother node.

Given that *n*-ary branching is permitted, it is possible to treat all modifiers — i.e., YPs which are both sister to and daughter of X′ — as sisters, without any particular hierarchical relationship to one another. Since there is no evidence from inflection for hierarchical relationships between modifiers in Kayardild I will follow this practice. Likewise, as mentioned above, adjuncts can be treated as sisters. Although many will indeed be treated in such a way, adjuncts will not be analysed as sisters when evidence from inflection indicates otherwise. As will we see shortly, the non-surface syntactic structure of Kayardild — posited on the basis of inflectional evidence — is at its most intricate at the level of adjuncts, in particular, at the level of DP adjuncts to VP and to S.

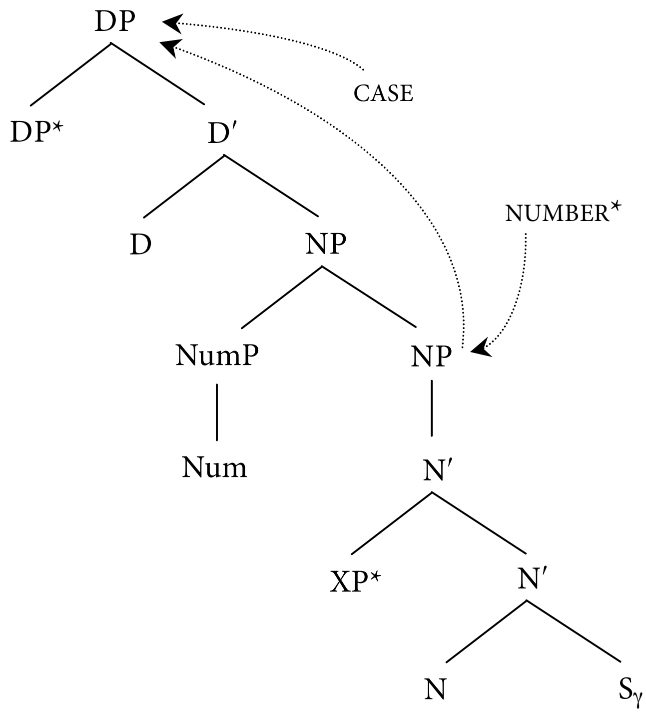
The configurational structure of the non-surface clause, and the attachment points of several feature values (though not all), is shown now in (6.40). A Kleene star, '*', indicates points at which multiple sisters may appear. On the meaning of the constituents labelled 'Pred' see §6.4.9.

(6.40) The non-surface clause



The non-surface syntax and surface syntax of DPs is identical, and is shown in (6.41).

(6.41) The DP



XP = DP, AP, VP

*On the attachment of NUMBER, see §6.6.6

6.4.6 Height of attachment and linear order of realisation

The syntactic nodes to which feature values attach have various heights relative to one another, inferred from the relative embedding of their domains. Turning to the realisation of features on individual words, if more than one feature is overtly realised on a word, then relative syntactic height generally[23] corresponds with the linear order of features' morphological realisation within the word. This issue is examined closely in Ch.7, §§7.2–7.3; see also §6.7 in this chapter.

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[23] The order of fOBL can be exceptional, cf §6.2.9.

6.4.7 Other approaches to layered clausal structure

Although it is beyond the scope of this dissertation to make more than passing comment, it is interesting to compare the layered view of Kayardild clause structure in (6.40) above, which is posited on the basis of evidence from morphosyntax, with the layered clause structure which has gained acceptance within Chomksian generative grammar over the past two decades. Although the latter is based on quite different empirical data and theoretical arguments, researchers such as Pollock (1989), Chomsky (1991), Cinque (1999) among many others, have argued that clauses possess a much more articulated hierarchical structure than was assumed in earlier models of generative grammar (Chomsky 1965; Chomsky 1986). Although more recent work has postulated predominantly abstract features, the seminal arguments for splitting the IP constituent made by Pollock (1989) originally focussed on visible tense and agreement morphology (in addition to verb movement) in English and French — and thus share a modicum of commonality with the arguments I will present for Kayardild, insofar as the layering of clause structure relates in some way to tense-like morphosyntactic features.[24] By the same token though, there are significant differences between the model of Kayardild syntax proposed here and mainstream Chomksian research into articulated clause structure.

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[24] Layered clause structure has also been invoked in generative accounts of 'scrambling' (e.g. Thráinsson 2001) — an empirical phenomenon in which DPs are freely rearranged. As noted earlier, DPs in Kayardild surface syntax also exhibit this behaviour.

In Kayardild the features which attach to each of the several nodes in the clause or in the DP, are assumed to do so because from that one structural position they can percolate downwards to many words, sometimes very many words, often spread across several subordinate, XP domains. By way of contrast, the clausal layers of recent generative theory are typically associated with features that trigger the movement of just one element (whether an X^0 head or a higher projection) into some domain associated with that feature, and thus the interaction between a clausal node and the rest of the clause is highly circumscribed. Actual morphological agreement has recently been pursued in relation to a quite different, long-distance 'Agree' operation (Chomsky 2000), though even here the focus remains on agreement between a trigger and one specific target. In Kayardild, the positing of layered clausal structure is fundamentally driven by the existence of triggers whose 'target' is everything that their node dominates.

6.4.8 Word classes and phrasal categories

As discussed in Ch.3, §3.1, the present analysis of Kayardild distinguishes between just two lexical, morphological word classes: **nominals**, and **verbals**. In terms of their morphomic composition, lexical verbal stems end formally in TH, while lexical nominal stems do not. In terms of syntax, verbal stems provide the base for words which are syntactically verbal, and nominal stem the base for words which are syntactically nominal. In addition to the morphologically grounded nominal and verbal superclasses though, the analysis of Kayardild syntax in this dissertation will also recognise various syntactic subclasses.[25]

To begin with nominals, the words which are built upon nominal lexical stems can be divided into several syntactic subclasses, members of which can occupy distinct types of syntactic positions (cf Evans 1995a: 236). A primary division can be made between subclasses which participate in non-surface syntactic structures and which consequently may become associated with morphosyntactic features and so inflect, and those which do not participate in non-surface syntactic structures and which therefore do not inflect. In the former group are determiners D, numbers Num, adjectives A, and nouns N. These all appear in (subconstituents of) determiner phrases. In the latter group are clitic particles,

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[25] This correspondence between a small number of morphological classes and a larger number of syntactic classes is typical of many Australian languages (Blake 1987: 2–3). In the present study, syntactic subclasses are posited with the aim of accounting for why certain morphosyntactic features end up associating with the words they do. In taking this (morpho)syntactically-driven approach, the current analysis more closely resembles the general approach to Australian languages taken by Blake (1987; 2001), than by Dixon (1980) who also places semantic properties at the forefront. By the same token, unlike Blake (2001) I define syntactic phrases (DP, AP, etc.) in terms of the syntactic subclasses (D, A etc.) of their heads rather than the broader morphological classes (nominal, verbal). In Evans (1995a) analysis, words classes are stated to be 'based on the suffixing possibilities for each word' (1995a: 84ff). Taken at face value this resembles the criteria used here for morphological classes. In practice though, semantic properties play a non-trivial role in distinguishing word classes from one another in Evans (1995a), and in some cases even pre-empt considerations from morphosyntax: some *particles* in Evans (1995a) inflect for A-TAM while others do not, yet they are treated as one word class presumably on the basis of their function; neither *conjunctions* nor *interjections* inflect, yet they are treated as two classes, and both are distinct from non-inflecting *particles*.

interjections and idiophones. In the analysis which presented in §6.9 below, particles participate in surface syntactic structures, but not in non-surface structures, and consequently they do not inflect. I assume that neither interjections nor idiophones participate in syntactic structures, and that this is why they fail to inflect.

Words built upon verbal lexical stems fall into two syntactic subtypes: verbs V and adverbs Adv, both of which always participate in non-surface syntactic structures.

Several nominal and verbal lexemes are able to function, with modified semantics, as more than one syntactic subclass. For example, *warngiij-* functions as D meaning 'a certain', as Num meaning 'one' and as A meaning 'common, shared'; *kurulu-th-* functions as V meaning 'kill' and as Adv meaning 'do intensely' (Evans 1995a: 86,237). Because the multiple syntactic subclasses of these words all correspond to a single morphological superclass though, there is no derivational morphology which signals a 'shift' between one syntactic subclass and the next, rather the exact same lexical stem is used in each syntactic function. Accordingly, disambiguation of the intended meaning of such lexemes relies on context — a matter which will play an important role in arguments for the existence of the DP in §6.6.1.

Corresponding to syntactic subclasses, the following phrasal categories will be recognised in Kayardild: determiner phrases DP, number phrases NumP, adjective phrases AP, noun phrases NP, verb phrases VP and adverb phrases AdvP.

The morphological and syntactic word classes recognised here can be compared brief with those of Evans (1995a): Evans (1995a) distinguishes five morphological word classes, of which the *verbal* class is identical to the verbal superclass used here, while Evans' *nominals, particles, conjunctions* and *interjections* all fall into the nominal superclass. A summary is shown in (6.42).

(6.42) Comparison of word classes

	Present analysis	
Evans (1995a)	Morphological	Syntactic
verbal	verbal	V, Adv
nominal	nominal	N, A, D, Num
particle	nominal	N if able to inflect; particle otherwise
conjunction	nominal	particle
interjection	nominal	(not syntactic)

Turning to multi-word units, the DP in this dissertation corresponds to the Evans' NP. The VP node of Evans (1995a) corresponds to VP_{γ} in the present analysis (and not to VP_{δ}, which is maximal VP node here). The *verbal complex* of Evans (1995a: 302–12) is comparable to the lowest levels of the VP here (the fragment dominated by VP_{ω}), modulo the complements of V. A summary appears in (6.43).

(6.43) Comparison of larger units

Evans (1995a)	Present analysis
NP	DP
VP	VP_{γ}
verbal complex	VP_{ω} modulo complements of V

6.4.9 Pred, an unresolved issue

In this dissertation I will not resolve the question of what the precise syntactic category is of certain Kayardild predicative constituents. For example, the main clausal predicate in

Kayardild can often be nominal in nature, as it is in (6.44), where the predicate is shown in boldface type.

(6.44)	*Dathina*	*kuna~wuna*	***jungarr-.***
	ʈaʈ̪ina	kuna-kuna-ø	cuŋara-ø
	that.T	‹child$_{NL}$-child$_{NL}$›-T	big-T
	that	‹child›-Ø	big-Ø
	'That child is big.' [W1960]		

The question which will remain open is whether the syntactic category of the predicate in (6.44) is a full DP, or perhaps an NP, or even just an AP. Likewise, it remains an open question what the precise syntactic category is of depictive second predicates, both nominal as in (6.45) and clausal as in (6.46), and what the precise syntactic category is of 'motion purpose' VPs as in (6.47). The predicates in (6.45)–(6.47) could be simple AP, NP or VP, or they could be embedded within a matrix DP.

(6.45)	***Darrathi-wu-***	*nga-ku-l-da*	*wuran-ku-*	*diya-j-u-.*
	ʈaraʈ̪i-kuu-ø	ŋa-ku-l-ta	wuɻan-kuu-ø	ʈ̪ia-c-kuu-ø
	hot-fPROP-T	1-2-pl-T	food-fPROP-T	eat-TH-fPROP-T
	hot-FUT-Ø	1-2-pl-Ø	food-FUT-Ø	eat-Ø-POT-Ø
	'We'll eat the food hot.' [R2005-jul21]			

(6.46) *Nga-da* ***kurri-n-ngarrba-*** ***wuran-ngarrb-,*** *ngum-ban-ju-*

ŋaṯ-ta	kuri-c-n-ŋarpa-ø	wuɻan-ŋarpa-ø	ŋuŋ-paɲ-kuu-ø
1sg-T	see-TH-‹fN-fCONS›-T	food-fCONS-T	2sg-fPOSS-fPROP-T
1sg-Ø	see-Ø-‹ANTE›-Ø	food-ANTE-Ø	2sg-Ø-FUT-Ø

wuu-j-u- .
wuː-c-kuu-ø
give-TH-fPROP-T
give-Ø-POT-Ø
'Having seen the food I will give it to you.' [W1960]

(6.47) *Balmbu-* *nga-da* *dali-j-u-*

palmpuː-ø	ŋaṯ-ta	ṯali-c-kuu-ø
tomorrow.fPROP-T	1sg-T	come-TH-fPROP-T
tomorrow.FUT-Ø	1sg-Ø	come-Ø-POT-Ø

ngum-ban-ji-ring-ku-	***kamburi-j-i-ring-ku-***
ŋuŋ-paɲ-ki-ɻiŋ-kuu-ø	kapuɻi-c-ki-ɻiŋ-kuu-ø
2sg-fPOSS-fLOC-fALL-fPROP-T	talk-TH-fLOC-fALL-fPROP-T
2sg-Ø-Ø-DIR-FUT-Ø	talk-Ø-Ø-DIR-FUT-Ø

'Tomorrow I'll come to talk to you.' [E453.ex.11-8]

For present purposes I will use the constituent label 'Pred' for all such predicates. The smaller predicative constituents (AP, NP, VP) will be assumed to relate to Pred either as a dependents at some yet to be determined depth, or to be Pred itself. Which of these alternatives is actually the case will not be crucial to any of the analyses presented in the remainder of the chapter, even when questions regarding the position of Pred within its wider clausal context are at issue.

6.5 Clause structure

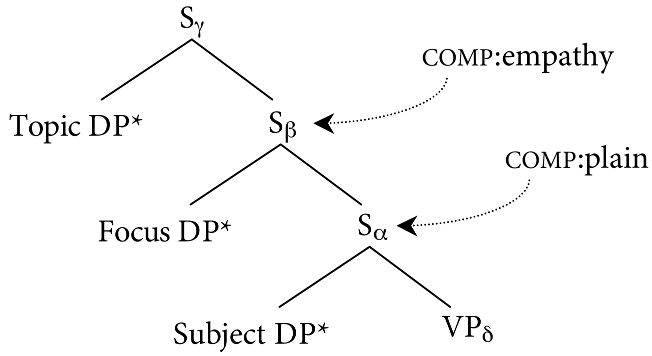
The purpose of §§6.5–6.9 is to refine the account of Kayardild inflection sketched in §6.4. This section introduces the data and argumentation which underlie the analysis of non-surface clause structure set out in §6.4.5. Significant parts of both the data and its interpretation are novel. Discussion is divided into four parts, beginning in §6.5.1 with COMPLEMENTISATION features, which attach to the S_α and S_β nodes, and in §6.5.2 with embedded S nodes. The substantial topic of A-TAM is covered in §6.5.4, and the lower reaches of the clause, below VP_ω are dealt with in 6.5.5.

6.5.1 COMPLEMENTISATION and S nodes

When words in a clause inflect for +COMP (i.e., for COMP:empathy or COMP:plain), every nominal and verbal word in the clause will do so except for words within topicalised DPs (Evans 1995a: 533–39).[26] Among non-topic DPs, there is also a contrast between focus DPs, which can only inflect for COMP:empathy, versus other clausal constituents which can inflect for either of the +COMP values — the existence of focus DPs is novel discovery. To accommodate these facts, the uppermost region of the Kayardild clause will be assumed to contain three hierarchically organised S nodes, as shown in (6.48).

[26] Regarding topicalised DPs in COMP:Ø clauses, see §6.5.4.6.

(6.48)



COMP features attach to the inner two S nodes, while topic DPs are daughters of the outermost node, and hence they inherit neither of the COMP values via feature percolation. COMP:empathy attaches to S_β and COMP:plain to S_α. Focus DPs are daughters of S_β and so can inherit COMP:empathy but not COMP:plain. Both +COMP values will percolate down to the rest of the clause. The remainder of this section examines in turn the subordinate clause use of +COMP in §6.5.1.1, the main clause use of +COMP with topic DPs in §6.5.1.2, and the main clause use of +COMP with focus DPs in §6.5.1.3.

6.5.1.1 Subordinate clause +COMP

The functions of complementised subordinate clauses and the conditions under which they are used, are discussed in Evans (1995a: 488–529). Since these are complex and not directly relevant to present matters they will not be reviewed here, though it can be noted that complementised subordinate clauses can be ‘insubordinated’ and appear without their matrix clause. In their (in)subordinate use, complementised clauses exhibit +COMP inflection on every nominal and verbal word in the clause. COMP:empathy is used if the subject of a clause is first person inclusive, or if it is second person and ‘the speaker wants to group him/herself with the addressee’ (Evans 1995a: 494), and is realised by fLOC on all words bar subject pronouns; COMP:plain is used otherwise, and is realised by fOBL on all words bar subject pronouns. Subject pronouns inflected for COMP:empathy are identical to uninflected pronouns; subject pronouns inflected for COMP:plain carry a special suffix glossed fCOMP.[27]

An example of a COMP:empathy subordinate clause, with a first person inclusive subject, is shown in (6.49), and with a second person subject in (6.50).

(6.49)	*Jina-a*	*bijarrb-,*	[*nga-ku-l-da*	*bakii--n-ki-*
	cina-a	picarpa-ø	ŋa-ku-l-ta	paki:-c-n-ki-a
	where-T	dugong-T	1-2-pl-T	‹all do-TH-fN›-fLOC-T
	where-Ø	dugong-Ø	1-2-pl(EMP)-Ø	‹all›-EMP-Ø

kurulu-th-arra-y-] ?
kuɻulu-t̪-ŋara-ki-a
kill-TH-fCONS-fLOC-T
kill-Ø-PST-EMP-Ø
'Where is the dugong which we all killed?' [E493.ex.12-12]

---

[27] Historically, the forms in COMP:empathy clauses derive from ergative marking: the proto Southern Tangkic ergative was realised by fLOC, except on pronouns where the bare pronominal stem was used. Forms in COMP:plain clauses derive from dative marking: the proto Southern Tangkic dative was realised by fOBL, except on pronouns, where the modern Kayardild fCOMP pronouns continue the old dative series. See further, Evans (1995a). Clauses with focus DPs (§6.5.1.3) descend from a matrix clause ergative DP (marked with fLOC, or unmarked if pronominal; fn.33 on p.501) plus a relative clause marked for ergative or dative case. The existence of such clauses in proto Southern Tangkic has already been reconstructed by Evans (1995a: 542–49).

(6.50) *Jina-a* *bijarrb-,* [*nying-ka* *kurulu-th-arra-y-*] *?*
cina-a picarpa-ø ɲiŋ-ka kuɻulu-t̪-ŋara-ki-a
where-T dugong-T 2sg-T kill-TH-fCONS-fLOC-T
where-Ø dugong-Ø 2sg(EMP)-Ø kill-Ø-PST-EMP-Ø
'Where is the dugong which you killed?' [E493.ex.12-13a]

A COMP:plain clause with a third person subject is shown in (6.64) below, and with a second person subject is shown in (6.51).

(6.51) *Jina-a* *bijarrb,* [*ngum-ba-a* *kurulu-th-arra-nth-*] *?*
cina-a picarpa-ø ŋuŋ-pa-a kuɻulu-t̪-ŋara-in̪t̪a-ø
where-T dugong-T 2sg-fCOMP-T kill-TH-fCONS-fOBL-T
where-Ø dugong-Ø 2sg-COMP-Ø kill-Ø-PST-COMP-Ø
'Where is the dugong which you killed?' [E493.ex.12-13b]

6.5.1.2 Main clause +COMP and topic DPs

Evans (1995a: 533–39) documents a main clause use of +COMP clauses, in which a topic DP fails to be inflected for +COMP, a fact which is analysed here as following from the placement of the topicalised DP as daughter of S_α.[28] An example of a COMP:plain clause containing a topic DP is shown in (6.52), where the topic DP appears in boldface.[29] An example of a COMP:empathy clause containing a topic DP is shown in (6.53).

[28] Regarding topic DPs in COMP:Ø clauses, see §6.5.4.6.

[29] Notice that in terms of surface syntax, the topic DP in (6.52), which is uninflected for +COMP, is straddled by DPs which do carry inflection for +COMP, illustrating the fact that the non-surface syntactic structure which determines inflectional distributions cannot be equated with constituent structure at the surface.

(6.52)	*Ngiju-wa-*	***bingkurn-da***	*wungi-j-arra-nth- !*
	ŋicu-pa-ø	piŋkuɳ-ta	wuŋi-c-ŋara-in̪t̪a-ø
	1sg-fCOMP-T	mud crab-T	steal-TH-fCONS-fOBL-T
	1sg-COMP-Ø	mud crab-Ø	steal-Ø-PAST-COMP-Ø

‘So I’ve been stealing *mangrove crabs*!’ [E536.ex.12-125d]

(6.53)	***Kambuda***-	*kala-th-uru-y-a*	*narra-nguni-wuru-y-a,*
	kamputa-ø	kala-t̪-kuɻu-ki-a	ɳara-ŋuni-kuɻu-ki-a
	nut-T	cut-TH-fPROP-fLOC-T	knife-fINST-fPROP-fLOC-T
	nut-Ø	cut-Ø-POT-EMP-Ø	knife-INST-FUT-EMP-Ø

kurda-wu-j-uru-y-
kuʈa-wu-c-kuɻu-ki-a
coolamon-fDON-TH-fPROP-fLOC-T
coolamon-DON-Ø-POT-EMP-Ø
‘*Pandanus nut* we’ll cut with a knife and put in a coolamon.’[R2005-jul08]

The topic DPs in (6.52) and (6.53) are both direct object topics. Evans (1995a: 534) also documents ‘instrument’ topics, which occur only in passive clauses. In both of Evans’ examples, the topic DP itself is elided and inferred from context. One example is repeated in (6.54). On the reasons why instruments should appear as topic DPs in passive clauses, see also §6.5.5.1.

(6.54)	*Kuna~wuna-ntha-*	*karii--j-urrk-.*
	kuna-kuna-in̪t̪a-ø	kaɻi-i-c-kurka-ø
	‹child$_{\text{NL}}$-child$_{\text{NL}}$›-fOBL-T	cover-fMID-TH-fLOC.fOBL-T
	‹child›-COMP-Ø	cover-MID-Ø-IMMED.COMP-Ø

Discussing a type of disinfectant leaf: ‘Babies are covered in it’ [E534.ex.12-121]

A third and final type of topic DP documented is a CASE:locative DP (Evans 1995a: 539), shown in (6.55).[30]

(6.55)	***Jungarra-y-a***	***mindulu-y-a***	*ngiju-wa-*	*badi-j-uu-nth-.*
	cuŋara-ki-a	mintulu-ki-a	ɲicu-pa-ø	pati-c-kuu-in̪t̪a-ø
	big-fLOC-T	bundle-fLOC-T	1sg-fCOMP-T	carry-TH-fPROP-fOBL-T
	big-LOC-Ø	bundle-LOC-Ø	1sg-COMP-Ø	carry-Ø-POT-COMP-Ø

‘I’ll carry mine *in a big bundle*.’ [E539.ex.12-132]

6.5.1.3 Main clause +COMP and focus DPs

Evans (1995a) does not describe +COMP clauses with focus DPs *per se*, although focus DPs which stand alone without any other clausal context (more on which below) are described as being marked by an ‘independent use of locative case’ — what is analysed here as an fLOC suffix realising COMP:empathy.

Complementised clauses containing focus DPs have the potential to be featurally more complex than other +COMP clauses. A COMP:empathy feature value attaches to the S_{β} node, which dominates the whole clause including the focus DP which is daughter of

[30] A complication here is that the inflection of both the topic DP and of the rest of the clause is identical in form to the inflection of a focus DP and its +COMP clause (specifically, in a COMP:plain clause, see §6.5.1.3 next). Semantically though, there are grounds to distinguish between topicalised locative DPs and focalised location DP (as in (6.59) below), and the example in (6.55) appears to contain a topic DP, rather than a focus DP.

S_β. Meanwhile, under the same conditions which govern its use in subordinate clauses,[31] a COMP:plain feature can attach to S_α.

In §6.4.4 it was remarked that S nodes are able to associate with at most one feature. This analysis of the S node derives in part from the facts of clauses under discussion now, in which COMP:empathy attaches to S_β and COMP:plain to S_α. In such clauses, the COMP:empathy feature on the S_β node percolates down onto the focus DP, but is unable to percolate onto the S_α node, because S_α is already associated with the COMP:plain feature. From the S_α node COMP:plain percolates down to the rest of the clause beneath it, and as a result, the focus DP inflects for COMP:empathy while the rest of the clause inflects for COMP:plain. For a formalisation of these facts, cf §6.7.

Since clauses of this type have not been documented before, I give four examples in (6.56)–(6.59). Examples (6.56)–(6.58) illustrate focus DPs in combination with all three of the A-TAM values permitted in +COMP clauses. The grammatical functions of the focus DPs are intransitive subject (6.56), transitive subject (6.57) and transitive object (6.58). The subjects are third person, and the focus DP is shown in boldface.

(6.56)	***Dan-kiy-a***	***kuna~wuna-y-a***	*barji-j-arra-nth- !*
	ʈan-ki-a	kuna-kuna-ki-a	paɻci-c-ŋara-in̪t̪a-
	this-fLOC-T	‹child$_{NL}$-child$_{NL}$›-fLOC-T	fall-TH-fCONS-fOBL-T
	this-EMP-Ø	‹child›-EMP-Ø	fall-Ø-PST-COMP-Ø

‘*This child* has been born!’ [R2005-jul21]

[31] That is, when the subject is first person exclusive, third person or possibly second person.

(6.57)

Ri-in-kiy-a	***bath-in-kiy-a***	***dangka-walath-iy-a***
ɻi-in-ki-a	paṯ-in-ki-a	ʈaŋka-palaṯ-ki-a
east-fFRM-fLOC-T	west-fFRM-fLOC-T	person-fPL-fLOC-T
east-ABL-EMP-ø	west-ABL-EMP-ø	person-PL-EMP-Ø

bana	***rilum-ban-jiy-a***	*jardi-wurrka-*
pana	ɻiluŋ-paɲ-ki-a	caʈi-kurka-ø
and	‹east.fALL-fPOSS›-fLOC-T	group-fLOC.fOBL-T
and	‹east.C.ORIG›-EMP-ø	group-PRES.COMP-Ø

dardanyi-j-urrka-	*nga-ku-lu-wan-jurrk-!*
ʈaʈaɲi-c-kurka-ø	ŋa-ku-lu-paɲ-kurka-ø
surround-TH-fLOC.fOBL-T	1-2-pl-fPOSS-fLOC.fOBL-T
surround-Ø-IMMED.COMP-Ø	1-2-pl-Ø-PRES.COMP-Ø

'*People from every which way (lit. from the east and west) and in the east* have surrounded us mob!' [R2005-aug02a]

(6.58)

Dan-kiy-a	***kuna~wuna-y-a***	***rika-walath-ij-iy-a***
ʈan-ki-a	kuna-kuna-ki-a	ɻika-palaṯ-ic-ki-a
this-fLOC-T	‹child$_{NL}$-child$_{NL}$›-fLOC-T	cold-‹fPL-fSAME›-fLOC-T
this-EMP-Ø	‹child›-EMP-Ø	cold-‹EVERY›-EMP-Ø

ngiju-wa-	*kari-j-uu-nth-!*
ŋicu-pa-ø	kaɻi-c-kuu-iṉṯa-ø
1sg-fCOMP-T	cover-TH-fPROP-fOBL-Ø
1sg-COMP-Ø	cover-Ø-POT-COMP-Ø

'I'll cover up *these children who are all cold*!' [R2005-jul19a]

In (6.59) the subject is first person inclusive,[32] so no COMP:plain feature is involved. The focus DP is a locative complement of V.

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[32] The focalised DP *kurdaya* is not the subject, as a third person subject would require COMP:plain marking on the rest of the clause (the elided subject is 'we'). Nor is *kurdaya* is a direct object, as the verb *wuyii-j-* is intransitive, rather it is a location-denoting

(6.59)	***Kurda-y-a***	*wu-yii-j-uru-y-a*	*nga-ku-l-da*
	kuʈa-ki-a	wuː-i-c-kuɻu-ki-a	ŋa-ku-l-ta
	coolamon-fLOC-T	‹put-fMID›-TH-fPROP-fLOC-T	1-2-pl-T
	coolamon-EMP-Ø	‹place on one's person›-Ø-POT-EMP-Ø	1-2-pl(EMP)-Ø

Talking about collecting edible foods: 'We'll pick them up and carry them on our person *in coolamons*' [R2005-jul08]

The focus DP construction is most often used to convey that the referent of the focussed DP has just come to the speaker's attention, often because it has just entered the extra-linguistic context. A common conversational implicature (Grice 1969; Sperber & Wilson 1986) associated with the focus DP construction is that the speaker's reason for articulating this fact is to bring the referent to the addressee's attention too. Evans (1995a: 141) documents essentially the same meanings associated with utterances consisting of nominal material alone, inflected with fLOC, which I analyse as focus DPs without an accompanying clause.[33] Examples from Evans (1995a) are shown in (6.60)–(6.61), and two key examples follow, which serve to clarify that the fLOC suffix involved is a marker neither of CASE nor of A-TAM, but of COMP:empathy.

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complement of V (on which see further §6.5.5.1). On the fact that *kurdaya* contains no overt realisation of CASE:locative see §6.6.7.2.

[33] Focus DPs most likely derive historically from ergative marked DPs in proto Southern Tangkic (cf fn.27 on p.495) — ergative case marking has recently been documented in a number of Australian languages as signalling not only the grammatical function of the DP (transitive subject) but also pragmatic functions, including focus and unexpectedness (Gaby 2008; McGregor 2006).

(6.60) *Wanku-y-a* *dathin-ki-* *ri-in-ki- !*
wanku-ki-a ʈat̪in-ki-a ɻi-in-ki-a
shark-fLOC-T that-fLOC-T east-fFRM-fLOC-T
shark-EMP-Ø that-EMP-Ø east-ABL-EMP-Ø
'Hey, there's a shark (coming at you) from the east there!' [E141.ex.4-28][34]

(6.61) *Rajurri--n-ki!*
ɻacuri-c-n-ki-a
walk-TH-fN-fLOC-T
walk-Ø-PROG-EMP-Ø
Granny to toddler: 'Hey you can walk!' [E142.ex.4-31]

Let us confirm that the fLOC in examples like (6.60)–(6.61) is indeed a realisation of COMP:empathy and not A-TAM:instantiated or CASE:locative. In (6.62) the word *bijarrbawuruya* conveys what the song (*wangarri*) is about. Now, since 'subject matter' DPs of this kind do not ever inflect for A-TAM (§6.5.4.2; also Appendix B, §B.5.4), the fLOC in these free-standing focus DPs cannot be a realisation of A-TAM.

(6.62) *Dan-kiy-a* *wangarr-i-,* *ngij-in-ji-,* *bijarrba-wuru-y- !*
ʈan-ki-a waŋar-ki-a ŋicu-iɲ-ki-a picarpa-kuɻu-ki-a
this-fLOC-T song-fLOC-T 1sg-fPOSS-fLOC-T dugong-fPROP-fLOC-T
this-EMP-Ø song-EMP-Ø 1sg-POSS-EMP-Ø dugong-PROP-EMP-Ø
'(Hear) this song, of mine, about dugong!' [R2007-may14a]

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[34] See also example (6.229) on p.629 where this same DP appears within an entire clause recorded by Wurm (1960).

Example (6.63) includes a non-possessive pronoun, which goes uninflected. If fLOC were realising a CASE feature this would be quite unexpected, but if it realises COMP:empathy it is exactly what we expect.[35]

(6.63) *Nga-da* *ra-rung-ki-!*
ŋat̪-ta ɻa-ɻuŋ-ki-a
1sg-T south-fALL-fLOC-T
1sg(EMP)-Ø south-ALL-EMP-Ø
A man has returned to Bentinck Island (the 'south' island) for the first time in decades: '(Look at) me in the south!' [R2005-jul05b]

On the basis of examples (6.62) and (6.63) we can conclude that fLOC in sentences like (6.60)–(6.61) is a realisation not of CASE or A-TAM, but of COMP:empathy.

6.5.1.4 Section summary

In §6.5.1 we have seen that COMP:empathy attaches to S_β and COMP:plain to S_α. Topic DPs, being higher than S_β and S_α, never inflect for COMP. Focus DPs are higher than S_α but lower than S_β so inflect for COMP:empathy but not COMP:plain. In clauses where both features are present, the presence of COMP:plain on S_α prevents the COMP:empathy feature from percolating onto it from S_β above. The interpretation is that S nodes can associate

[35] Utterance (6.63) cannot be analysed as a verbless clause with a standard, uninflected subject DP plus a predicate DP (*rarungki*) on which the fLOC realises either CASE:locative or A-TAM:instantiated, the reason being that predicative, compass allative DPs like *rarung-* inflect neither for A-TAM:instantiated nor CASE:locative (§6.5.4.2; Appendix B, §B.4.4).

with only one feature; if already associated with COMP:plain, an S node cannot inherit COMP:empathy.

6.5.2 Embedded S and VP

Kayardild permits two kinds of embedded, clause like constituents. One, which I analyse as embedded S_γ (the maximal S projection), never inherits any morphosyntactic features from clauses above it, and can always contain a subject. The other, which I analyse as embedded VP_δ (the maximal VP projection) always inherits morphosyntactic features from nodes above it and never contains a subject. Embedded S is discussed in §6.5.2.1 and compared with embedded VP in §6.5.2.2. For a detailed treatment of the functions of embedded S, see Evans (1995a: 488–542, under the rubric of 'finite subordinate clauses').

6.5.2.1 Embedded S itself

An embedded S_γ constituent does not inherit any features from its matrix clause. On the analysis advocated here this results from a conspiracy of two factors. First, S nodes can only associate with COMP features — and it would be impossible therefore for them to inherit any other feature from above — and second (as far as has been attested) matrix clauses which contain embedded S nodes are uncomplementised, i.e., they have no COMP feature which could percolate to the embedded S node. In (6.64) an uncomplementised matrix clause contains a complementised subordinate clause; in (6.65) both the matrix and subordinate clauses are uncomplementised.

(6.64)	*Nga-da*	*kurri-j,*	[$_S$ *ni-wa-a*	*natha-wurrka-*
	ŋat̪-ta	kuri-ca	ŋi-pa-a	ŋat̪a-kurka-ø
	sg-T	see-TH.T	3sg-fCOMP-T	camp-fLOC.fOBL-T
	sg-Ø	see-ACT	3sg-COMP-Ø	camp-PRES.COMP-Ø

dana-th-urrk-] .
ʈana-t̪-kurka-ø
leave-TH-fLOC.fOBL-T
leave-Ø-IMMED.COMP-Ø
'I saw him leave the camp.' [E495.ex.12-20]

(6.65)	*Nga-da*	*warra-j-arra-*
	ŋat̪-ta	wara-c-ŋara-ø
	1sg-T	go-TH-fCONS-T
	1sg-Ø	go-Ø-PST-Ø

[$_S$ *kurri-j-u-*	*dulk-u-*]	*Rukuthi-na-.*
kuri-c-kuu-ø	ʈulk-kuu-ø	ɻukut̪i-ki-naa-ø
look-TH-fPROP-T	country-fPROP-T	(place name)-fLOC-fABL-T
look-Ø-POT-Ø	country-FUT-Ø	(place name)-Ø-PRIOR-Ø

'I went to Rukuthi to see the country.' [E499.ex.12-30]

Like any S constituent, the subject of an embedded S may or may not be overt, as illustrated in (6.64) and (6.65) respectively.

Perception verbs such as *kurri-j-* 'see' in (6.64) can take embedded S complements (see Evans 1995a: 512–13), as can predicate nominals such as *mungurru* 'know that S', which appears in (6.37) above.

6.5.2.2 Embedded VP compared with embedded S

Embedded VP_δ differs from embedded S_γ in several ways.

Unlike embedded S, the constituent which is analysed here as embedded VP (i) may not contain a subject; (ii) will not have its own COMPLEMENTISATION features; and (iii) will inherit all features from its dominating node. Under the present analysis, these differences follow from the fact that embedded VPs lack any S nodes, and that (i) subject DPs are daughters of S; (ii) COMP features attach to S nodes; and (iii) that only S nodes resist inheriting features from above.

The existence of embedded VPs motivates the recognition of S_{α} (the lowest S node) and VP_{δ} (the highest VP node) as distinct nodes in the non-surface clause, even though they always end up associating with the same morphosyntactic features (the reader can confirm this in the tree in (6.40) above). Because S_{α} and VP_{δ} associate with the same features, their daughter DPs will inflect alike as far as COMP and A-TAM are concerned. Nevertheless, those daughters are not equivalent. The DP daughters of S_{α} are subjects and do not appear in embedded VPs. The DP daughters of VP_{δ} include depictive second predicates on the subject and various adjunct DPs, and they do appear in embedded VPs.

Evans (1995a: 484–86) treats what is taken here to be embedded VP as an *embedded, subject-less S.*[36] This decision can be understood as following from Evans' identification of 'VP' with what is analysed here as VP_{γ} (cf §6.4.8), a slightly smaller constituent than what gets embedded. The stance taken here is that the facts of embedding point to the proper identification of VP with VP_{δ}. This analysis not only

[36] 'Motion purpose' clauses are an exception. Evans states that these are 'VPs embedded directly beneath a matrix adjunct NP' (1995a: 453), although a supporting argument is not offered, nor is any comparison made with normal 'subject-less S' embedded clauses.

makes for a simpler description of what appears in 'embedded VPs', but also places the Kayardild VP on par with that of many other languages, in which the only DPs external to VP are subjects and DPs in grammaticalised discourse functions such as topic and focus.

Embedded VPs are attested within Pred constituents, and within DPs that are subjects, direct objects or CASE:proprietive instruments.

6.5.3 The attachment of TH-TAM and NEGATION

Unlike COMP:empathy and COMP:plain, there is no hard and fast evidence regarding the features TH-TAM and NEGATION which bears on the question of which non-surface syntactic node(s) they attach to. This section collects together and lists the few observations which are relevant to the matter.

In terms of the linear order of their realisation, TH-TAM and NEGATION precede COMP in a word, and all things equal this suggests that their node of attachment is lower in the non-surface syntactic tree than that of COMP:empathy and COMP:plain — that is, lower than S_α and S_β.

Because TH-TAM and (potentially) NEGATION are realised on all verbal words (§6.4.8) and all nominals inflected with thematic CASE (§6.2.6), they must attach at least as high as VP_α, in order to dominate them.[37]

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[37] Because DPs with thematic CASE are never topic or focus DPs, and because they never inflect for A-TAM features associated with their clause, they could in principle be located anywhere within the non-surface clause so long as TH-TAM and NEGATION attach above

A source which could possibly provide evidence for the attachment sites of TH-TAM and NEGATION, is the nature of S and VP embedding, namely, in embedded VPs the feature NEGATION appears not to be contrastive, and only a subset of TH-TAM values occur, as listed in (6.66).

(6.66)

Values of TH-TAM permitted in subordinate VPs
Antecedent, directed, progressive, resultative, nonveridical

A possible interpretation of these facts is that while TH-TAM values in (6.66) attach to a VP node, the NEGATION feature and the TH-TAM values other than those in (6.66) attach to some higher node, which for present purposes we can call T. This split of TH-TAM and POLARITY between VP and T would account for the absence of NEGATION and most TH-TAM values in embedded VPs, and would eliminate the need to stipulate such facts by other means. By the same token though, we would then want to clarify the status of this T node, and this turns out to be somewhat problematic. As already mentioned, the facts of suffix ordering suggest that T is below S_α. By hypothesis T is not a VP node (this is why it cannot appear in embedded VPs), but it is also unlike S nodes, because it can associate with features other than COMP. In sum, at this stage of research, positing a T node would not solve any more problems than it would introduce. I therefore remain conservatively with the clause structure motivated by inflectional evidence alone, which was set out in (6.40) in §6.4.5. At the same time, we can acknowledge that there may be grounds to

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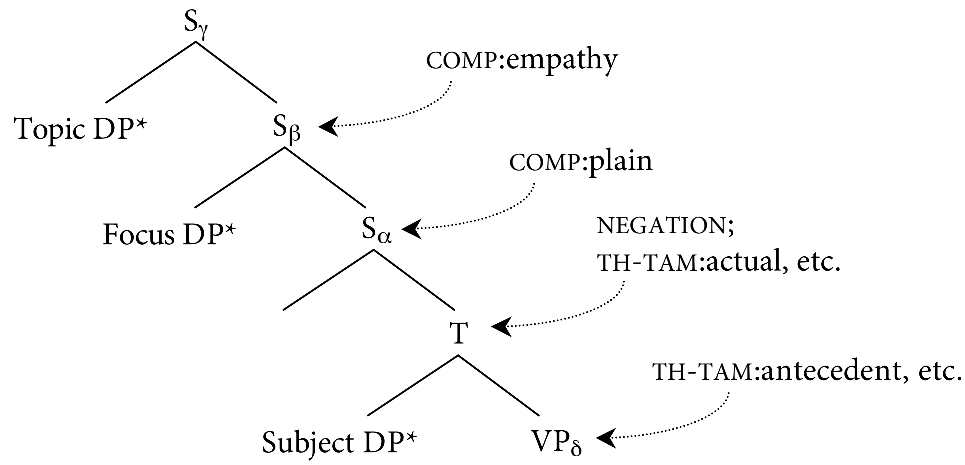
them. I will assume that like all DPs other than the complements of V, they are daughters of one of the VP nodes VP_α–VP_δ.

further elaborate the upper reaches of the clause, adding a T node, along the lines shown in (6.67).

(6.67) Possible elaboration of clause structure (not adopted here)



6.5.4 A-TAM and the adjuncts of VP

We now come to the topic of A-TAM features, and of VP nodes. A-TAM features values attach to VP nodes which in turn dominate (i) other VP nodes, and (ii) adjuncts of VP (where the adjuncts of VP are DPs or Pred constituents). Different values of A-TAM attach to different nodes and hence have different, and embedded, domains. This section is divided as follows: §6.5.4.1 introduces the basic relationships of A-TAM values to one another, in terms of the embedding of their domains and its analysis in terms of hierarchical non-surface syntax, §6.5.4.2 summarises the empirical data which stands behind these claims, §6.5.4.3 reviews the reasons why a syntactic analysis of these facts is preferable to an alternative, 'diacritic' analysis. In §§6.5.4.4–6.5.4.6 attention turns to three individual topics related to A-TAM, respectively A-TAM in embedded clauses, A-TAM in verbless clauses, and A-TAM in relation to VP-internal topic DPs. A summary concludes the section in §6.5.4.7.

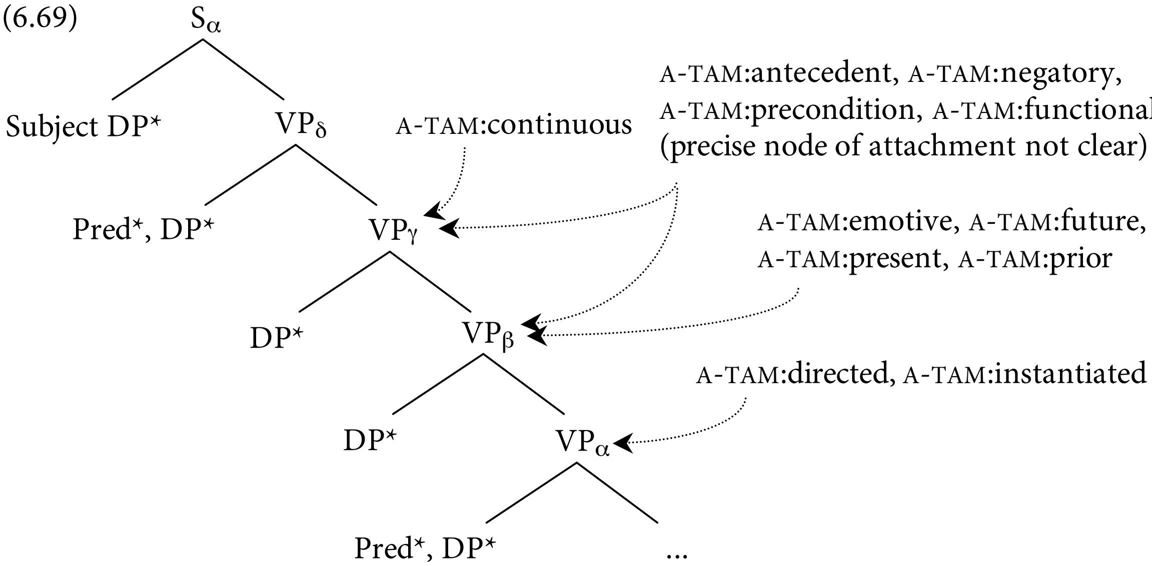
6.5.4.1 *The domains of individual* A-TAM *values*

Different A-TAM values have different domains, and as always, the various different domains are hierarchically embedded within one another. The relationships between those domains are shown in (6.68), along with the domains of COMP:empathy and COMP:plain (note that the domains of the antecedent, negatory, precondition and functional A-TAM values are underdetermined by the currently available data).

(6.68) **D**(COMP:empathy) ⊃ **D**(COMP:plain) ⊃ **D**(A-TAM:*x*) ⊃ **D**(A-TAM:*y*) ⊃ **D**(A-TAM:*z*),
where:
x = continuous*
y = emotive, future, present, prior*
z = directed, instantiated
*possibly also antecedent, negatory, precondition, functional

Accordingly, the values of A-TAM are analysed each as attaching to one of three non-surface syntactic nodes, hierarchically arranged with respect to one another, and with respect to S_α and S_β, to which the COMP features attach (§6.5.1), as shown in (6.69). The DP and Pred daughters of the VP_δ node are those which associate with no value of A-TAM, even though they are neither subjects, topics nor focus DPs.

(6.69)



The fact that A-TAM domains are embedded within one another is not new in the description of Kayardild, though some details are.

Evans (1995a) makes a fundamental distinction between *associating case* — which corresponds to A-TAM:continuous, and has the widest confirmed domain of the A-TAM values — versus *modal case* which corresponds to other A-TAM values[38] and has a narrower domain.

Evans also observes that some DP types which generally inflect for *modal case* fail to do so for A-TAM:instantiated.[39] That observation is refined here in two respects. First,

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[38] Though not to A-TAM:antecedent, A-TAM:precondition and A-TAM:functional which are analysed by Evans as non-modal case markers, cf Ch.2 §§6.2.6–6.2.7.

[39] These observations are made with respect to individual DP types throughout Evans' Grammar (1995a). A general note and accompanying table appear at one point (1995a:

A-TAM:instantiated and A-TAM:directed pattern together: any DP which escapes inflection for A-TAM:instantiated also escapes inflection for A-TAM:directed. Second, Evans' observation, cast in terms of his *instantiated modality* is only valid in COMP:Ø clauses. In +COMP clauses, what Evans regards as *instantiated modality* patterns with the majority of A-TAM values, such as emotive, future, prior and so forth, and takes a wider domain. Accordingly, on the current analysis Evans' *instantiated modality* is split into A-TAM:instantiated in COMP:Ø clauses, and A-TAM:present in +COMP clauses.[40]

In §6.5.4.2 we turn to the data which underlie these analyses.

6.5.4.2 The VP mother nodes of DP adjuncts

Appendix B of this dissertation presents a substantial volume of new data, and newly collated existing data, attesting the patterns of A-TAM inflection exhibited by many different types of DP. The data support the analysis that any given DP type may follow one of only four patterns of A-TAM inflection: (i) it may inflect for no A-TAM values; (ii) it may inflect only for A-TAM values which attach to VP_γ; (iii) it may inflect only for A-TAM values which attach to VP_γ or VP_β; or (iv) it may inflect for all values — that is, for values which attach to VP_γ, VP_β or VP_α. DPs of type (i) are located above all of the nodes

110), but these under-represent the true variety of DP types which are recognised elsewhere in the Grammar as participating in this pattern.

[40] This division of Evans' (1995a) *instantiated modality* into A-TAM:instantiated and A-TAM:present is not without its semantic basis: A-TAM:instantiated (in COMP:Ø clauses) has a default-like, non-future tense meaning, while A-TAM:present (in +COMP clauses) has a more specifically present tense meaning (Evans 1995a: 511–12).

to which A-TAM features attach, and so cannot inherit those features via percolation; they include topic and focus DP daughters of S_γ and S_β, subject DP daughters of S_α, and adjunct DP daughters of VP_δ. DPs of type (ii) are adjunct daughters of VP_γ, and inherit via percolation only those A-TAM features which attach to VP_γ. DPs of type (iii) are adjunct daughters of VP_β, and inherit via percolation A-TAM features which attach to either VP_γ or VP_β. DPs of type (iv) inherit all A-TAM features and thus must be located below VP_α; they include complement DPs of V (at the bottom of the clause) and adjunct DP daughters of VP_α.

We may next ask, what properties of a DP are correlated with the mother node beneath which the DP appears in the non-surface syntax. In the general case, the decisive property is the DP's semantic or grammatical role in the clause. Occasionally though the lexical class of the head N of NP overrides this. Moreover, because a DP's CASE value is correlated to a large extent with its semantic/grammatical role, A-TAM behaviour is often fully predictable from a DP's CASE value. Table (6.70) summarises the inflectional behaviours of DPs which one would typically regard as being 'semantic arguments' in a clause; 'adverbial' DPs follow below.

(6.70) A-TAM inflection of 'argument-like' DPs

DP CASE and semantic/grammatical role	Inflection for A-TAM values associated with VP_α	VP_β	VP_γ	Parent node of DP
CASE:Ø direct objects CASE:locative locations, non-human demoted subjects & second object DPs	+	+	+	V′
CASE:utilitive DPs CASE:instrumental DPs CASE:genitive circumessives CASE:proprietive instruments	+	+	+	VP_α
CASE:Ø VP-internal topic DPs CASE:allative DPs reflexive pronoun *marin-*	–	+	+	VP_β
CASE:proprietive intentional objects & destinations, instruments & transferred objects CASE:proprietive 'subject matter' DPs	–	–	+	VP_γ
CASE:ablative DPs	–	–	(?)[41]	VP_γ or VP_δ
CASE:genitive demoted inanimate subjects CASE:associative DPs	–	–	–	VP_δ
CASE:Ø subjects	–	–	–	S_α
CASE:Ø, CASE:locative focus DPs	–	–	–	S_β
CASE:Ø, CASE:locative VP-external topic DPs	–	–	–	S_γ

Table (6.71) summarises the inflectional behaviours of DPs whose semantics is more 'adverbial'. Some adverbial DPs exhibit variable behaviour and are listed twice.

[41] Data is not available.

(6.71) A-TAM inflection of 'adverbial-like' DPs

head N of NP in DP	Inflection for A-TAM value associated with VP_{α}	VP_{β}	VP_{γ}	Parent node of DP
CASE:Ø demonstrative locations *jina- darr-* or *jinardarr-* 'what time' *darr-* 'occasion' *barruntha-* 'yesterday' *yanij-* 'first' *kada-* 'again'	+	+	+	VP_{α}
balmbi- 'tomorrow'	(?)	+	+	VP_{α} or VP_{β}
basic stem compass locational allative stem compass locational ablative stem compass locational as predicate CASE:locative *barruntha-* 'yesterday' *jina-* 'where' *jijina-* 'in what direction' *yan-* 'now, soon'	–	+	+	VP_{β}
ablative stem compass locational counted occasions & durations measured in units *jijina-* 'in what direction' *yan-* 'now, soon'	–	–	(?)	VP_{γ} or VP_{δ}
kada- 'again'	–	–	–	VP_{δ}

The reader is referred to Appendix B for the full data sets on which the summaries in (6.70)–(6.71) are based, and for minor comments. The task of distilling these DP types into coherent groups whose inflectional behaviour can be predicted *en bloc* is far from trivial, and the task will not be attempted in this dissertation.

6.5.4.3 Arguments for a syntactic analysis

The question of which pattern of A-TAM inflection a given DP type follows might well be one whose answer is largely idiosyncratic, but the patterns themselves are highly constrained: there are only four possibilities available. This section reviews the key reasons why a syntactic analysis of the facts of Kayardild A-TAM inflection is preferable to an alternative which at first glance appears plausible and perhaps even simpler, and which can be referred to as a 'diacritic' analysis. Under the diacritic analysis, each DP type is associated not with a syntactic mother node but with a diacritic, which marks it as a member of one of four classes, corresponding to the four possibilities for A-TAM inflection. The analyses measure up against one another as follows.

Both analyses permit DP types to associate idiosyncratically with the available patterns of A-TAM inflection, and both analyses contain a reasonable mechanism for constraining the number of attested patterns to just four types. However, under a syntactic analysis, it also follows that the four patterns relate to one another in an embedded fashion: if pattern X involves more A-TAM values than pattern Y, then it will involve all the values of pattern Y, plus one or more additional value. By employing a syntactic analysis an implicit claim is made that the embedding of domains is an essential and fundamental property of the Kayardild inflectional system. This is not the case under a diacritic analysis. To be sure, a diacritic analysis can reproduce embedding, but it will either treat that embedding as accidental, or its non-accidental status will need to be independently stipulated. As such, the adoption of a diacritic model would carry an implicit claim that embedding is accidental, or at the very least non-essential. As we turn to the facts of A-TAM inflection within embedded VPs, it becomes clear that the claim that embedding is fundamental to the Kayardild inflectional system is indeed what we want to make.

The most compelling argument for the syntactic analysis comes from the facts of A-TAM inflection in embedded VPs, the details of which are expanded upon in §6.5.4.4 next, and summarised now. Under a syntactic analysis, we are not surprised to find that embedded VPs inherit A-TAM features from VP nodes above them (as they do) and moreover, that *all* DPs in those embedded VPs inflect for such features — this includes DPs which normally do not inflect for A-TAM features because normally they are higher in clause than the node from which those features percolate. The same facts are captured awkwardly at best under a diacritic analysis: we must independently stipulate that DPs of any class act as if they were in a different class when inside an embedded VP. In addition, many DPs in embedded VPs inflect not for one but for two A-TAM features (one originating from a node in the embedded VP, and one from a node in the matrix clause). On the diacritic analysis, these DPs would have to be simultaneous members of two classes — two layered classes — in which case, the very 'classhood' of a DP begins to behave as if it were a feature percolating down a syntactic tree.

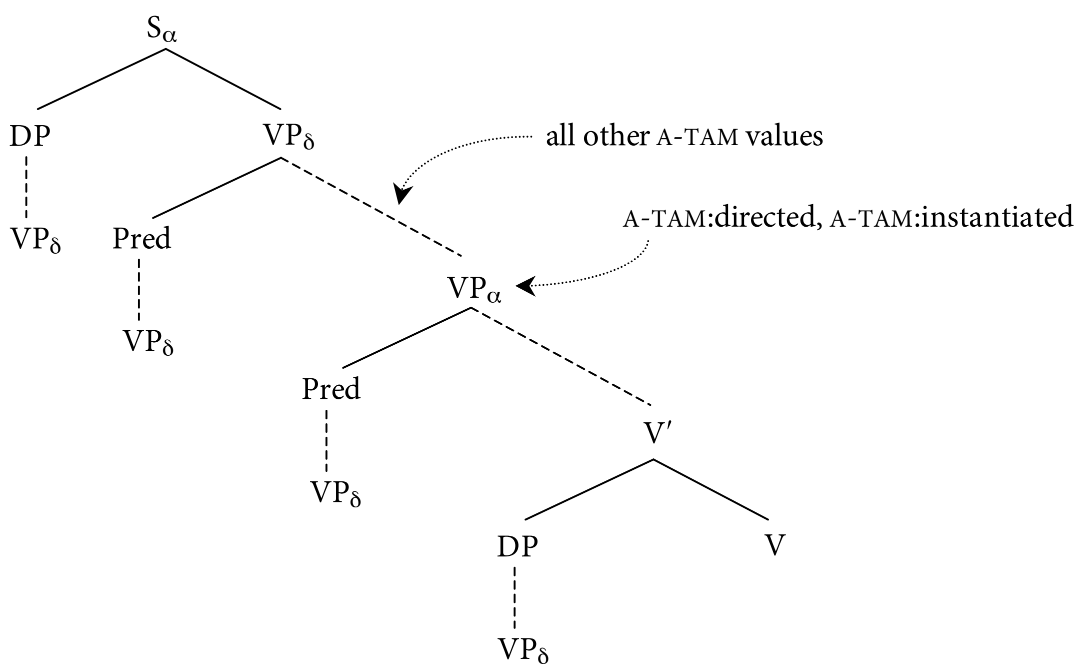
In short, a syntactic analysis of the distribution of A-TAM inflection correctly treats domain embedding as something fundamental to the organisation of Kayardild morphosyntax, and it extends without any complications to the most complex data. Neither of these virtues are shared by the diacritic analysis.

6.5.4.4 Matrix clause A-TAM in embedded VPs

This section sets out the evidence referred to in §6.5.4.3 above, that embedded VP nodes inherit A-TAM features in a normal way, as do all of the constituents within them.

Embedded VPs occur in several non-surface syntactic configurations within a matrix clause, as shown in (6.72). Those configurations will be assumed for the purpose of this section, but are argued for elsewhere in the chapter (see the continued discussion below for crossreferences). In (6.72) and in other syntactic diagrams in this section, dashed lines indicate sections of structure which have been abbreviated by skipping intermediate nodes.

(6.72)



VP relative clauses are embedded within a DP (cf §6.6.2, §6.8.5.3). Relative clauses on the subject occur within DPs which are, like all other subject DPs, daughters of S_α. Relative clauses on the direct object occur within DP which are, like all other object DPs, complements of V. Depictive second predicate VPs and 'motion purpose' VPs are embedded within Pred constituents (§6.4.9). Preds containing depictive second predicates on the subject are daughters of VP_{δ} (§6.5.2.2); Preds containing motion purpose clauses or depictive predicates on the direct object are daughters of VP_{α}. As can be seen in (6.72), an embedded VP will sit either above all nodes to which A-TAM values attach, or below all nodes to which A-TAM values attach.

In terms of the morphosyntax which is internal to embedded VPs, the A-TAM values that embedded VPs can be associated with (inherently, as opposed to those inherited from a dominating, external node) are given in (6.73).

(6.73)

Values of A-TAM found in subordinate VPs
Antecedent, continuous, directed, negatory, functional; (also A-TAM:Ø)

Let us now consider embedded VPs in various syntactic positions in the matrix clause, and in particular, in various positions relative to the node in the matrix clause to which the matrix A-TAM feature attaches. In (6.74) the embedded VP has the function of a depictive, second predicate on the subject and is contained within a Pred constituent which is daughter of VP_{δ}. The A-TAM and TH-TAM values of the matrix clause are {A-TAM:future, TH-TAM:potential} and are subscripted to the right-hand bracket on the matrix clause. The inherent A-TAM and TH-TAM values of the embedded clause are {A-TAM:antecedent, TH-TAM:antecedent}, subscripted at its right-hand bracket.

(6.74) [*Nga-da* [***kurri-n-ngarrba-*** ***wuran-ngarrb-*** ANTE, ANTE], *ngum-ban-ju-*

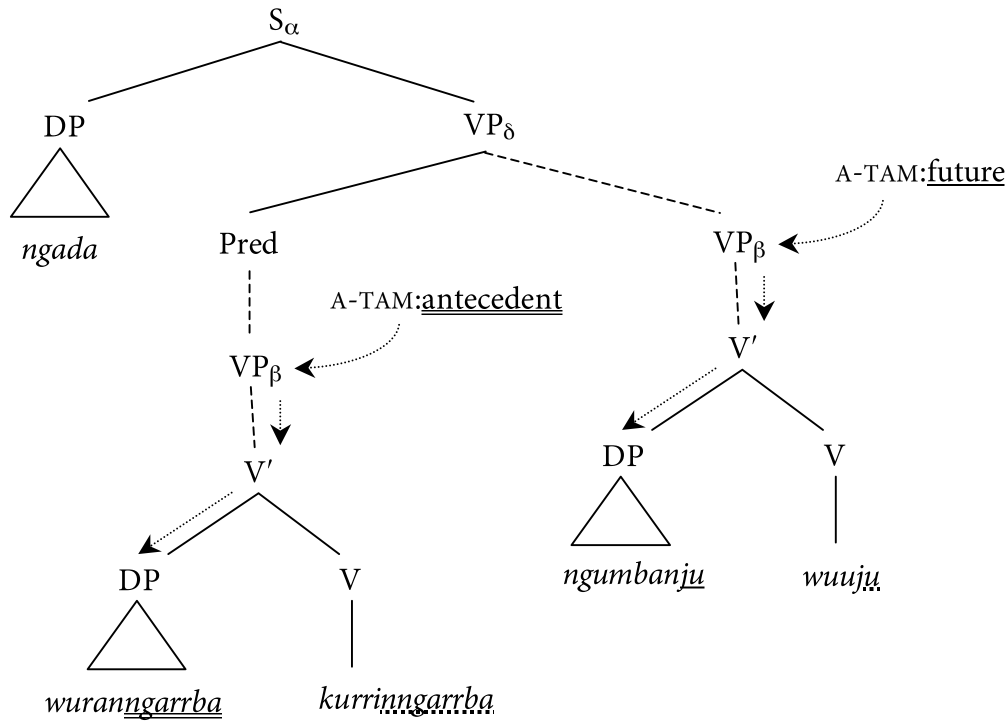
ŋat̪-ta	kuri-c-n-ŋarpa-ø	wuɻan-ŋarpa-ø	ŋuŋ-paɲ-kuu-ø
1sg-T	see-TH-‹fN-fCONS›-T	food-fCONS-T	2sg-fPOSS-fPROP-T
1sg-Ø	see-Ø-‹ANTE›-Ø	food-ANTE-Ø	2sg-Ø-FUT-Ø

wuu-j-u- FUT, POT] .
wuː-c-kuu-ø
give-TH-fPROP-T
give-Ø-POT-Ø
'Having seen the food I will give it to you.' [W1960]

In this instance, nothing in the embedded VP inflects for matrix A-TAM (even though, for example, the DP within the embedded clause is a direct object, a DP type which always inflects for the A-TAM value of its own clause). The reason for this can be seen in (6.75), which reproduces the relevant aspects of the non-surface syntactic structure of (6.74). Directed, dotted lines with arrowheads show the attachment and then percolation of A-TAM features.[42] The matrix A-TAM feature and its morphological realisations are single underlined, the embedded A-TAM feature and its morphological realisations are double underlined, and all realisations of TH-TAM features are indicated by a dotted underline.

[42] For the purposes of the discussion, I will assume that A-TAM:antecedent attaches to VP_{β}, though it may actually attach to VP_{γ} (§6.5.4.1). Nothing hinges on this assumption though.

(6.75)



In (6.75) as always, features attach to their appropriate node and then percolate downwards. Because the embedded VP is not dominated by the matrix node to which matrix A-TAM:future attaches, it entirely escapes inflection for A-TAM:future. Recall also, from §6.2.6, that A-TAM features are only realised on stems which do not end in the thematic, TH. Since lexical verb stems all end in TH, the lexical stem itself will never inflect directly for A-TAM (§6.4.8) — in (6.75), as a consequence, the verbs inflect only for TH-TAM.

Turning to a different scenario, the embedded VP in (6.76) functions as a relative clause in a direct object DP, which is the complement of V (the direct object DP in this case lacks a head N in its NP; see (6.77) below regarding the precise syntactic structure). Both the matrix and embedded A-TAM and TH-TAM values are the same as in (6.74), but this time every word in the embedded clause inflects for the matrix A-TAM value, A-TAM:future.

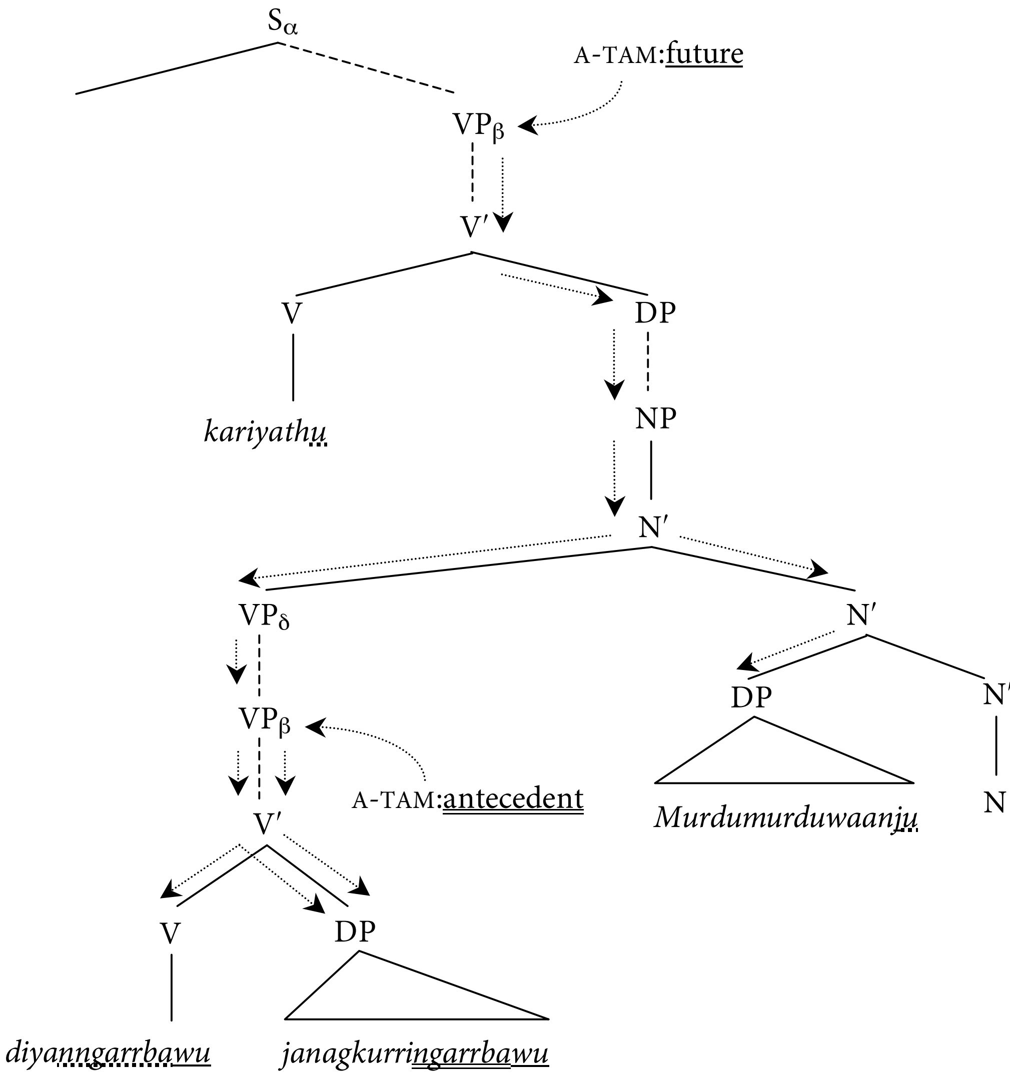
(6.76)	[*Kariya-th-u-*	*jingkar-maru-th-u-,*	[***diya--n-ngarrba-wu-***
	kaɻia-t̪-kuu-ø	ciŋkaɻ-maɻu-t̪-kuu-ø	ʈia-c-n-ŋarpa-kuu-ø
	conceal-TH-fPROP-T	scrub-fDAT-TH-fPROP-T	eat-TH-‹N-fCONS›-fPROP-T
	conceal-Ø-POT-Ø	scrub-DAT-Ø-POT-Ø	eat-Ø-‹ANTE›-FUT-Ø

janangkurri-ngarrba-wu- ANTE, ANTE]	*Murdumurdu-waan-ju-* FUT, POT]
canaŋkuri-ŋarpa-kuu-ø	muʈumuʈu-waːɲ-kuu-ø
goat-fCONS-fPROP-T	(place name)-fORIG-fPROP-T
goat-ANTE-FUT-Ø	(place name)-ORIG-FUT-Ø

‘He will conceal in the scrub (the ones) from Murdumurdu who have eaten the goat.’ [E1987-9-1]

The relevant non-surface syntactic structure in (6.76) is as shown in (6.77) (for simplicity, the word *jingkarmaruthu* is omitted). Due to its low position within the matrix clause, the embedded VP this time inherits the matrix feature A-TAM:future.

(6.77)



A word on the inflection of the verb in the embedded VP. As summarised just above, A-TAM features get realised on stems which do not end in the thematic TH. Meanwhile, TH-TAM features get realised only on stems ending in TH; and all lexical verb stems end in TH. Now, within an embedded clause, a nominal or a verbal stem will inflect first for the syntactically lower, local feature and only after that for the syntactically higher feature inherited from the matrix clause (cf §6.4.6). This means that an embedded verb stem, which lexically ends in TH (call it /X-TH/), will first inflect for the TH-TAM feature of the embedded clause. Next, since all TH-TAM suffixes ends in something other than TH, the TH-TAM-inflected verb has the form /X-TH-Y/ (and not /X-TH-Y-TH/), and so is now receptive to being inflected for an A-TAM feature, which is precisely what transpires if an A-TAM feature is inherited from the matrix clause. This is why the embedded verb *diyanngarrbawu* in (6.76/6.77) ends in a inflection for the matrix A-TAM feature, A-TAM:future.

A third embedded VP is shown in (6.78). This time the embedded VP is a motion purpose clause. Motion purpose clauses lie within a Pred daughter of VP_{α}, making them low enough to inherit any matrix A-TAM feature, and consequently in (6.78) each word of the embedded VP inflects for matrix A-TAM:future.

(6.78)	[*Balmbu-*	*nga-da*	*warra-j-u-*
	palmpuː-ø	ŋat̪-ta	wara-c-kuu-ø
	tomorrow.fPROP-T	1sg-T	go-TH-fPROP-T
	tomorrow.FUT-Ø	1sg-Ø	go-Ø-POT-Ø

[***bijarrba--ring-ku-***	***raa-j-i-ring-ku-*** $_{\text{DIR,DIR}}$] $_{\text{FUT, POT}}$]
picarpa-ki-ɻiŋ-kuu-	ɻaː-c-ki-ɻiŋ-kuu-
dugong-fLOC-fALL-fPROP-T	spear-TH-fLOC-fALL-fPROP-T
dugong-Ø-DIR-FUT-Ø	spear-Ø-Ø-DIR-FUT-Ø

‘Tomorrow I will go to spear dugong.’ [E474.ex.11-83]

So far the examples we have seen, although consistent with the ‘syntactic’ analysis of A-TAM inflection, are also more or less consistent with a ‘diacritic’ analysis. The only DPs inside embedded VPs which we have seen inflecting for matrix A-TAM features are direct objects, and direct objects always inflect for A-TAM anyway. Perhaps A-TAM inflection is just 'greedy': with the exception of DPs in subject second predicates, any DP which usually inflects for local A-TAM features will inflect for all A-TAM features. What would be surprising under such an account would be a DP type which never inflects for its local A-TAM value, but, when placed in an embedded VP, does inflect for a matrix A-TAM value. This is in fact what happens.

Consider DPs inflected for CASE:associative (which choose VP_{δ} as their mother node, see §6.5.4.2) and DPs inflected for CASE:ablative (which choose VP_{γ} or VP_{δ}).[43] As illustrated in (6.79) and (6.80), *ngukurnurru* 'water-ASSOC' and *dangkana* 'man-ABL' both escape inflection for A-TAM:instantiated, which attaches lower down, at VP_{α}.

(6.79)	[*Nguku-karran-jiy-a*	***nguku-rnurru-***	*diya-ja*	*wirdi-j* INS,ACT] .
	ŋuku-karaɲ-ki-a	ŋuku-ŋuru-a	ʈia-ca	wiʈi-ca
	water-fGEN-fLOC-T	water-fASSOC-T	eat-TH.T	stay-TH.T
	water-GEN-INS-Ø	water-ASSOC-Ø	eat-ACT	stay-ACT
	'They ate around the water, at the water.' [E1984-03-01]			

(6.80)	[*Bijarrba-*	*ra-yii-ja*	***dangka--na-*** INS,ACT].
	picarpa-ø	ɻaː-i-ca	ʈaŋka-ki-naa-ø
	dugong-T	spear-fMID-TH.T	man-fLOC-fABL-T
	dugong-Ø	spear-MID-ACT	man-Ø-ABL-Ø
	'The dugong is/was speared by the man.' [E2.ex.1-6]		

Now, in (6.81) and (6.82), directly comparable DPs occur within embedded VPs. In (6.81) the embedded VP is a second predicate on the object, so occurs within a Pred

[43] Importantly, at this point we need to consider DPs whose mother node is a VP node, and to ignore DPs embedded within other DPs — for why DPs embedded in DPs are different, see §6.8.5.3.

constituent under VP_{α}. In (6.82), the embedded VP is a direct object relative clause, so occurs within a DP which is complement of V. As is common, the DPs are in too high a position within their local clause to inflect for the local A-TAM value. However, because the embedded VP itself is low enough in the matrix clause, those same DPs inherit the matrix A-TAM feature, A-TAM:instantiated.[44]

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[44] Contrary to the evidence adduced in this section, Evans (1995a) claims at one point that DPs 'which escape modal case in main clauses ... also escape it in subordinate clauses despite the fact that the modal case originates in a higher clause' (1995a: 113). As evidence, the sentence reproduced in (a) is provided, the analysis being that the final word of the embedded clause, *rarungkuunth*, fails to inflect for matrix A-TAM:instantiated (if it did so, it would appear as *rarungkuruwurrk*) — this, even though the embedded verb does inflect for A-TAM:instantiated (showing that the embedded clause inherits A-TAM:instantiated). Evans' analysis is shown in (a), and a reanalysis in (b).

(a) Syntactic analysis after Evans (1995a: 113)

[*Nga-da*	*barruntha-y-a*	*kurri-ja*	*dangka-yarrng-ki-*
ŋat̪-ʈa	parun̪t̪a-ki-a	kuri-ca	ʈaŋka-kiarŋ-ki-a
1sg-T	yesterday-fLOC-T	see-TH.T	man-fDU-fLOC-T
1sg-Ø	yesterday-INS-Ø	see-ACT	man-DU-INS-Ø

[*warra-n-**ki**-*	***ra-rung-kuu-nth**-* CONT,PROG] INS,ACT]
wara-c-n-ki-a	ɻa-ɻuŋ-kuː-n̪t̪a-ø
go-TH-fN-fLOC-T	south-fALL-fPROP-fOBL-T
go-Ø-PROG-INS-Ø	south-C.ALL-PROP-**CONT**-Ø

'Yesterday I saw the two men going to the south.' [E113.ex.3-45]

In (b) the final word is reinterpreted as sitting in its own subordinate, complementised clause (i.e., S, not VP) — the fOBL morph realises not A-TAM:continuous but COMP:plain. Because embedded S never inherits A-TAM from a matrix clause (cf §6.5.2), there is no source for an A-TAM:instantiated feature on *rarungkuunth*, and that is why we fail to see it there.

(6.81) [*Nga-da* *kiyarrng-kiy-a* *wurkara-y-a* *kurri-j,*
ŋat̪-ta kiarŋ-ki-a wuɻkaɻa-ki-a kuri-ca
1sg-T two-fLOC-T boy-fLOC-T see-TH.T
1sg-Ø two-INS-Ø boy-INS-Ø see-ACT

[***jirrkara-rnurru-y-a*** ***jalji-rnurru-y-a*** *wirdi--n-ki-* CONT,PROG] INS,ACT]
cirkaɻa-ɳuru-ki-a calci-ɳuru-ki-a wiʈi-c-n-ki-a
north-ASSOC-INS-T shade-ASSOC-INS-T stay-TH-fN-fLOC-T
north-ASSOC-INS-Ø shade-ASSOC-INS-Ø stay-Ø-PROG-INS-Ø
'I see two boys staying in the shade in the north.' [W1960]

(b) Reanalysis of (a)
[*Nga-da* *barruntha-y-a* *kurri-j-a-* *dangka-yarrng-ki-*
1sg-Ø yesterday-INS-Ø see-Ø-ACT-Ø man-DU-INS-Ø

[*warra-n-ki-* CONT,PROG] **[*ra-rung-kuu-nth-*** FUT,POT, COMP] INS,ACT]
go-Ø-PROG-INS-Ø south-C.ALL-PROP-**COMP**-Ø
Lit: 'Yesterday I saw the two men walking, who were going to the south.'

(6.82)	[*Wulkatharri-*	*bath-in-ki-*	*durrwaa-ja*	*ngardarrji--*
	wulkat̪ari-a	pat̪-in-ki-a	ʈurwaː-ca	ŋaʈarci-ki-a
	(place name)-T	west-fFRM-fLOC-T	chase-TH.T	dugong-fLOC-T
	(place name)-Ø	west-ABL-INS-Ø	chase-ACT	dugong-INS-Ø

nga-k-in-da	*murrukurnang-k,*	*bath-in-ki-*
ŋa-ku-iɲ-ta	murukuɳaŋ-ka	pat̪-in-ki-a
1-2-fPOSS-T	your Fa my cross cousin-T	west-fFRM-fLOC-T
1-2-POSS-Ø	your Fa my cross cousin-Ø	west-ABL-INS-Ø

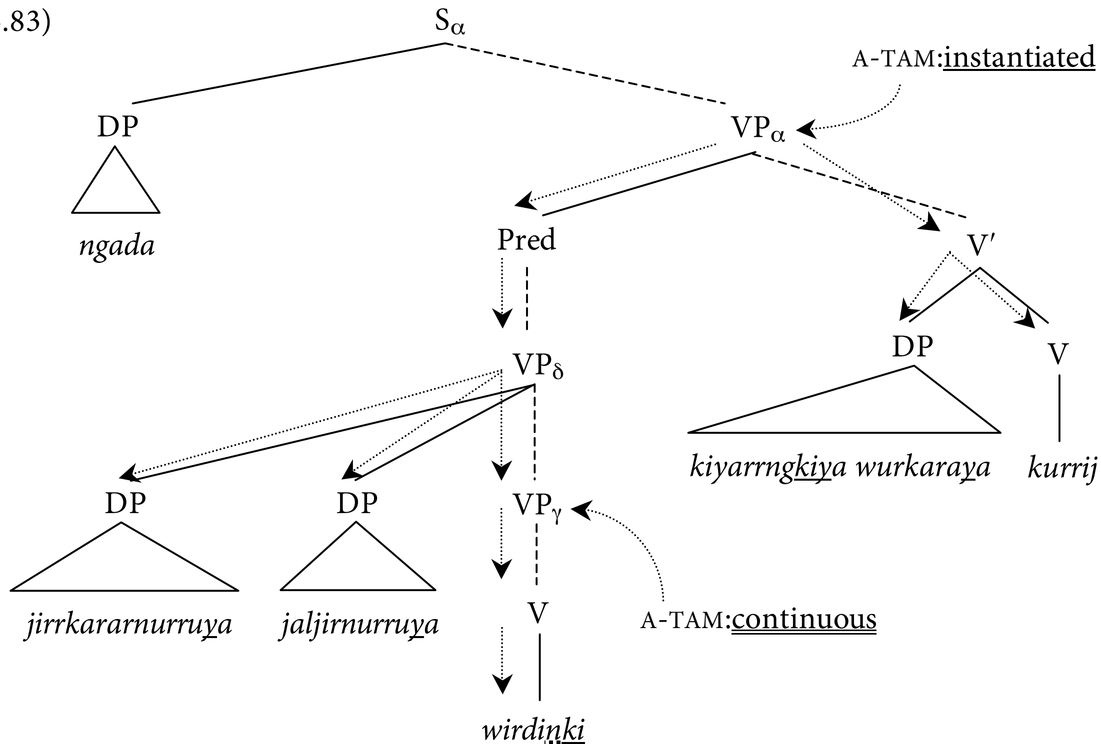
ba-lum-ban-ji-	[***ni-wan-jiyarrng-ki-naba-y-a***
pat̪-ɻuŋ-paɲ-ki-a	ŋi-paɲ-kiarŋ-ki-napa-ki-a
west-‹fALL-fPOSS›-fLOC-T	3sg-fPOSS-fDU-fLOC-fABL-fLOC-T
west-‹ORIG›-INS-Ø	3sg-POSS-DU-Ø-ABL-INS-Ø

jibarna-yarrng-ki-naba-y-a	*birdiru-th-irrin-ji-* Ø,RES] INS,ACT]
cipaɳa-kiarŋ-ki-napa-ki-a	piʈiɻu-t̪-iriɲ-ki-a
MoBr in law-fDU-fLOC-fABL-fLOC-T	miss-TH-fRES-fLOC-T
MoBr in law-DU-Ø-ABL-INS-Ø	miss-Ø-RES-INS-Ø

‘At Wulkatharri the one who was your father and my second cousin chased a pregnant dugong from the west, one from the west that had been missed by his two uncles-in-law.’ [E480.ex.11-64]

The relevant non-surface syntactic structure of (6.81) is shown in (6.83).

(6.83)



To summarise, we have seen cases in which the DPs within embedded VPs inflect for (i) local A-TAM only; (ii) local and matrix A-TAM; and (iii) matrix A-TAM only. The fourth possibility, inflection for neither local nor matrix A-TAM, can be found in example (6.88) in §6.5.4.5 below. All of these patterns follow regularly from the analysis of inflection based on non-surface syntactic structure proposed here.

6.5.4.5 A-TAM and predicate DPs in verbless clauses

The aim of this next section is to demonstrate that clauses without a verb, in which the main predicate is a DP or a Pred constituent (cf §6.4.9), still possesses a very similar non-surface syntactic structure to clauses with a verb. Like in clauses with an overt main verb, A-TAM features attach to their usual VP nodes and percolate down from there. Depending on the position of a main predicate DP or Pred within the non-surface syntactic structure, it will either inherit and inflect for A-TAM or not. The purpose here is not to provide a comprehensive description of predicate types, but to illustrate these basic facts. In keeping with those aims, it is useful to begin with locational DP predicates.

As shown by Evans (1995a: 315–16) and illustrated in (6.84) and (6.85), predicate DPs that specify the location of the subject can inflect for A-TAM.

(6.84)	*Marrbi-*	***dan-ku-***	***natha-wu*** .
	marpi-a	ʈan-kuu-ø	ŋa̪ta-kuu-ø
	maybe-T	this-fPROP-T	camp-fPROP-T
	maybe-ø	this-FUT-Ø	camp-FUT-Ø

‘Maybe (they’ll stay) in this camp.’[45] [E315.ex.9-10]

[45] Note that the temporal semantics conveyed by A-TAM relate as always to the event depicted by the clause, and not to the entity referred to by the predicate DP: that is, (6.84) means ‘Maybe they will stay in this camp’, and never ‘Maybe they are staying in this camp-to-be’.

(6.85)	*Dathina*	*yarbu-d,*	***marrwa--ri***	***minda--ri***
	ṯaṯina	jaɻpuṯ-ta	marwa-ki-ɻi	minta-ki-ɻi
	that.T	snake-T	nearby-fLOC-fALL.T	base-fLOC-fALL.T
	that	snake-Ø	nearby-Ø-DIR	base-Ø-DIR

kamarr-i-r.[46]	*Jaa--n-marii-j-i-r.*
kamar-ki-ɻi	caː-c-n-maɻu-i-ṯ-ki-ɻi
rock-fLOC-fALL.T	enter-TH-‹fN-DAT-fMID›-TH-fLOC-fALL.T
rock-Ø-DIR	enter-Ø-‹allow self›-Ø-Ø-DIR

'That snake is at the base of the rock. It has tucked itself under it (lit. is allowing itself to enter).' [W1960]

In (6.84) and (6.85), the N heads of NP in the predicate DP are normal nouns: 'camp' in (6.84) and 'rock' in (6.85), and the DPs inflect for A-TAM:future and A-TAM:directed, which attach to VP_{β} and VP_{α}, respectively. On the basis of this evidence, we can surmise that locational predicate DPs with plain nominal heads of NP take VP_{α} as their mother node.

When the head of NP in a locational predicate DP has an inherently locational meaning, the situation is different. Kayardild has several classes of inherently locational nominals, including relational types such as *marrwa-* 'nearby; near to', *walmu-* 'up high; on top of', and several paradigms based on terms for the four cardinal compass points (Ch.3, §3.10). When an inherently locational nominal heads the NP in a predicate DP, the DP does not inflect for A-TAM:instantiated (which attaches to VP_{α}), as shown in

[46] Evans (1995a: 316.ex.9-12) documents a similar DP predicate marked with fLOC-fALL, and interprets it as being inflected for CASE:allative. In (6.85) at least, the appearance in the very next sentence of TH-TAM:directed, which always co-occurs with A-TAM:directed (cf §6.1.3), suggests that fLOC-fALL marks not CASE:allative but A-TAM:directed.

(6.86), though it does inflect for A-TAM:present (which attaches to VP_{β}) as shown in (6.87). The conclusion based sentences such as these is that predicate DPs with an inherently locational N head of NP, select VP_{β} as their mother node.

(6.86)	*Niy-a*	***ba-lung-k**.*
	ŋ̪i-a	pat̪-ɻuŋ-ka
	3sg-T	west-fALL-T
	3sg-Ø	west-ALL-Ø
	'He's in the west.' [W1960]	

(6.87)	***Ba-lung-kurrka-***	*yarbuth-inja-*	*dirra-yarbuth-inj-.*
	pat̪-ɻuŋ-kurrka-ø	jaɭput̪-in̪t̪a-ø	t̪ira-jaɭput̪-in̪t̪a-ø
	west-fALL-fLOC.fOBL-Ø	animal-fOBL-T	‹rain-animal›-fOBL-T
	south-ALL-PRES.COMP-Ø	animal-COMP-Ø	‹cyclone›-COMP-Ø
	'The cyclone (lit. "rain-beast") is in the west.' [R2005-aug02a]		

Other DP and Pred predicates do not inflect for A-TAM (Evans 1995a: 313–20, esp.19). They will be assumed to be daughters of VP_{δ}, too high in the non-surface syntactic tree to inherit A-TAM.

To close this section, an interesting example is shown in (6.88), where a subordinate VP appears to be embedded in the Pred daughter of VP_{δ} in a clause with no overt main verb. The A-TAM value of the matrix, verbless clause is A-TAM:future, as revealed by the A-TAM:future marking that appears on the temporal DP *jangkawu darru* 'another time'. Nevertheless, the VP embedded in Pred is too high to inherit it.[47]

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[47] Evans (1995a: 473) analyses the sentence in (6.88) as mono-clausal, with the consequence (which he notes) that A-TAM:future appears to pair, very uncharacteristically, with TH-TAM:progressive in a single clause. Under an analysis that places the last two

(6.88) *Jangka-wu-* *darr-u-* [$_{\text{Pred}}$[$_{\text{VP}}$ *kamarr-karra* *balaa---n-d*]] [48]
caŋka-kuu-ø ʈar-kuu-ø kamar-kara pala-i-ṯ-n-ta
other-fPROP-T occasion-fPROP-T stone-fGEN.T hit-fMID-TH-fN-T
other-FUT-Ø occasion-FUT-T stone-GEN hit-MID-Ø-PROG-Ø
'Another time (your head)'ll get broken on a stone.' [E473.ex.11-31],
Lit. 'Another time (you will be) being hit by a stone.'

6.5.4.6 A-TAM and VP-internal topic DPs

This section argues that unlike the topic DPs of +COMP clauses (§6.5.1.2), topic DPs that appear in COMP:Ø clauses are VP-internal, specifically, they are daughters of VP_{β}, a fact which will explain their absence from clause types with particular A-TAM values.

The only DPs which ever undergo topicalisation in Kayardild are those which otherwise would be complements of V (see §6.5.5.1 below). In §6.5.1 topicalised DPs in complementised clauses were argued to be daughters of S_{γ}, based on the fact that they escape all inflection for COMP:empathy and COMP:plain. In uncomplementised clauses, the facts which need to be accounted for are somewhat different. They are: (i) that the topic DPs in uncomplementised clauses do not inflect for A-TAM, and (ii) that the topic DPs in uncomplementised clauses are only ever found when the A-TAM value of the clause is

words in an embedded clause, the sentence obeys the normal co-occurrence restrictions on TH-TAM and A-TAM values.

[48] In (6.88), the embedded VP within Pred is too high in the syntactic tree to inherit matrix A-TAM. In addition, the demoted inanimate subject of the passive embedded clause (*kamarrkarra*) is daughter of VP_{δ}, so is too high to receive its local A-TAM feature, A-TAM:continuous (which attaches to VP_{γ}). The DP *kamarrkarra* in (6.88) therefore represents an instance in which a DP in an embedded VP inflects neither for local nor for inherited A-TAM (cf discussion in §6.5.4.4).

either A-TAM:instantiated or A-TAM:directed. Evans (1995a: 110,532) documents topic DPs in {COMP:Ø, A-TAM:instantiated} clauses; the existence of topic DPs in {COMP:Ø, A-TAM:directed} clauses is a new observation. An example is provided in (6.89), where the topic DP appears in boldface (the corresponding untopicalised DP would be *miburiri ngijinjir*, inflected for A-TAM:directed).

(6.89)	***Miburl-da***	***ngij-in-d,***	*waduw-a*	*jaa-j-i-r.*
	mipuɭ-ta	ŋicu-iɲ-ta	watu-a	caː-c-ki-ɻi
	eye-T	1sg-fPOSS-T	smoke-T	enter-TH-fLOC-fALL.T
	eye-Ø	1sg-POSS-Ø	smoke-Ø	enter-Ø-Ø-DIR
	‘The smoke is getting in my eyes.’ [W1960]			

These facts will fall out as a matter of course if we assume that topic DPs in uncomplementised clauses are daughters of VP_{β}.

The feature values A-TAM:instantiated and A-TAM:directed both attach to VP_{α}, and so topic DP daughters of VP_{β} will escape inflection for them. All other A-TAM values attach either to VP_{β} or to VP_{γ}, meaning that the same topic DP daughters of VP_{β} would inflect for them. Now, if a topic DP in an uncomplementised clause did inflect for A-TAM, it would become indistinguishable from its untopicalised counterpart, a DP complement of V (given that complements of V are so low in the clause that they inflect for every A-TAM value). Consequently, the topicalised–untopicalised contrast is neutralised in uncomplementised clauses for A-TAM values other than A-TAM:instantiated or A-TAM:directed. When speakers wish to topicalise a DP in a clause with an A-TAM value other than instantiated or directed, the clause is switched to +COMP (Evans 1995a: 532), and the topic DP placed under S_{γ}.

6.5.4.7 Section summary

Section 6.5.4 focussed on the part of the non-surface clause built around the four VP nodes VP_α–VP_δ. The purpose was to introduce the structure of that part of the clause, to set out the kinds of data which motivate positing it, and to show how those data are accounted for in terms of it.

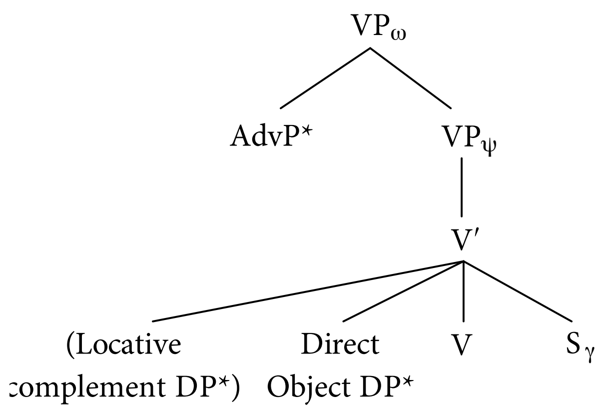
Depending on the specific value, A-TAM features attach to one of three VP nodes (VP_α, VP_β or VP_γ) and percolate down from there. Depending on the placement of DP and Pred constituents relative to these nodes, they will either inherit those A-TAM features or not. The placement of DPs depends by default on the semantic/grammatical role of the DP, though in certain cases it can be overridden and determined instead by the N head of NP. Pred constituents are daughters of VP_δ in the case of depictive second predicates on the subject and in the case of most nominal predicates in verbless clauses, or are daughters of VP_α in the case of depictive second predicates on the direct object, and of 'motion purpose' clauses. Within all these structures features percolate in a normal fashion, even into subordinate clauses, and the articulated VP structure of the non-surface clause is present even in verbless clauses. Arguments were given in §6.5.4.3 for why a syntactic analysis of these facts is superior to a conceivable alternative, the 'diacritic' analysis.

Throughout remainder of the chapter, reference will regularly be made to distributions of A-TAM features and the structure of the clause, built around VP_α–VP_δ, which regulates them.

6.5.5 The clause below VP_ω

The lowest part of the clause, below VP_ω, contains the head verb, its complements, and adverb phrases, as shown in (6.90).

(6.90)



This area of the clause lies below all of the nodes to which COMP, TH-TAM, NEGATION and A-TAM attach, and as such, the head verb and adverbs in the clause will always inflect for TH-TAM and NEGATION and the complements of V always for A-TAM, and all of these for COMP.

The V head can take one, or perhaps two DP complements, which are discussed in §6.5.5.1. On clausal, S complements of V see §6.5.2 above.

Adverbs come in several semantic types (Evans 1995a: 302–12), such as manner adverbs (eg. *kurulu-th-* 'do intensely'), aspectual adverbs (eg. *karrngi-j-* 'keep doing') and the quantificational adverb *bakii-j-* 'all do; do to all'. It will be assumed here that an Adv head projects an AdvP which it occupies on its own. There are no morphosyntactic features that attach to AdvP nodes, rather AdvPs inherit all of their features via feature percolation. In addition to AdvPs more generally, there is one syntactically distinctive type which will be referred to as **motion adverbs**. These are equivalent to Evans' *motion verbs* (1995a: 308–11) and are discussed in §6.5.5.2.

6.5.5.1 Complements of V

There is evidence in Kayardild for the existence of two syntactically privileged types of DP, both of which could be analysed as complements of V (though I will not draw any firm conclusions here). As one would expected, one of these types is direct objects. The other, somewhat surprisingly, is a class of DPs with locative CASE. Below I examine evidence from passivisation, focalisation, topicalisation and the interaction of CASE with A-TAM.

As Evans (1995a:348–52) documents, both direct objects and locations can be promoted to subject when their clause is passivised. An example of the latter is shown in (6.91).

(6.91)	*Jatha-y-a*	*dulk-i-*	*kamburi-j,*
	cat̪a-ki-a	ƫulk-ki-a	kampuɻi-ca
	other-fLOC-T	place-fLOC-T	talk-TH.T
	other-INS-Ø	place-INS-Ø	talk-ACT

kamburii---nang-ku-	***dathina***	***dulk*-.**
kampuɻi-i-c-naŋ-kuu-ø	ƫat̪ina	ƫulk-a
talk-fMID-TH-fNEG-fPROP-T	that.T	place-T
talk-MID-Ø-NEG-POT-Ø	that	place-Ø

'(They) spoke in another place. That place mustn't be spoken in.'
[E352.ex.9-147]

Passivisation is therefore the first area in which we find direct objects and locations patterning alike.

Moving to topicalisation, recall from §6.5.1.2 that three DP types can appear as topics. The first two are direct objects and location DPs (the latter in CASE:locative). The third is 'instruments' — or put another way, non-human demoted subjects — in passive clauses. One may ask why, of all DP types, non-human demoted subjects can be topicalised, when many other DP types cannot. The answer appears to be that non-human demoted subjects can be treated as locations, as follows.

Evans (1995a:351) documents both animate and inanimate non-human demoted subjects inflecting like locations. The examples provided by Evans are directly comparable with locations encoded as CASE:locative DPs below VP_{α} (on which see Appendix B, §B.1.2), the key fact being that they inflect for any A-TAM value. Moreover, location DPs in general can also appear as CASE:Ø daughters of VP_{β} (on which see Appendix B, §B.4.1) — in such cases, they avoid inflection for A-TAM values that attach to VP_{α} and show no inflection for CASE. In (6.92), we find a demoted inanimate subject in precisely the same inflection structure: *narraa* 'knife' appears as a CASE:Ø daughter of VP_{β}, inflected neither for A-TAM:instantiated (which attaches to VP_{α}) nor CASE.

(6.92)	*Bana*	*junkuw-a*	*kalaa--j,*	***narra-a.***
	pana	cunku-a	kala-i-ṯa	ŋara-a
	and	straight-T	cut-fMID-TH.T	knife-T
	and	straight-Ø	cut-MID-ACT	knife-Ø

'And (the umbilical cord) is cut straight through by the knife.' [R2005-jul08]

To be clear, the fact that non-human demoted subjects are susceptible to topicalisation appears to be entirely divorced from their semantic role: human demoted subjects cannot be topicalised.[49] The topicalisation of non-human demoted subjects appears to depend instead on the fact that at some level of representation, they are treated like locational DPs. If we assume that this is the case, then topicalisation is just like promotion to subject in passive clauses, operating on direct objects and on CASE:locative locational DPs.

Turning finally to focalisation, as documented in §6.5.1.3 the only non-subject DPs attested as undergoing focalisation are, once again, direct objects and location-denoting DPs (I currently do not have any examples of focalised DPs in passive clauses).

These data can be interpreted as follows. Perhaps there is just one true (direct object) complement of V which can be passivised, focalised and topicalised, but it is also the case that certain location DPs (including non-human demoted subjects which are treated as locations) can be 'promoted' to complement status and hence feed into those alternations; or perhaps there are two complement positions, one associated with CASE:Ø and one with CASE:locative. While I can find no evidence which decisively favours one or the other of these interpretations, there are two observations regarding CASE and A-TAM which may be relevant.

Firstly, as will be discussed further in §6.6.7 below, pronominal direct objects can inflect either for CASE:Ø or for CASE:locative in apparent free variation, and this could be taken to reflect their ability to occupy either of the two 'complement' positions. Second,

[49] Human demoted subjects inflect for CASE:ablative or CASE:oblique, CASE values which location DPs do not take.

location DPs in the locative CASE sit below VP_{α} in the non-surface syntactic tree (see Appendix B, §B.1.1), an observation which at the least is compatible with their occupying a V complement position.

6.5.5.2 *TH-TAM inflection of motion adverbs is not special*

While other adverbs are free to appear in the surface syntax either before or after the main verb, and need not be adjacent to it, motion adverbs always appear in immediate post-verbal position (for more on this fact, see §6.9.3.2 below). Motion adverbs have also been claimed to inflect for TH-TAM and NEGATION according to principles that differ from those which are responsible for the inflection of other constituents in the clause (Evans 2003), a claim which is contested in this section.

The set of motion adverbs is enumerated in (6.93), together with their meanings and the meanings taken by the same forms when used as a main verb, following Evans (1995a: 308–11).

(6.93)

Stem form	Meaning: as adverb	as main verb
thaa-th-	'go and V, expecting to return'	'return'
warra-j-	'go/come along while V-ing'	'go/come'
dana-th-	'V as SUBJ moves away from OBJ', or 'V before SUBJ moves away'	'leave'
wara-th-	'V OBJ as OBJ moves away' or 'V OBJ before OBJ moves away'[50]	'send'
wurdiyalaa-j-	'walk about, V-ing (everywhere)'	'walk about'
wanjii-j-	'go/come up to V'	'go/come up'

Motion adverbs are analysed here as acquiring their inflectional features in the same way as any other word, via feature percolation. Contrary to this view, Evans (2003) argues that the inflection of motion adverbs is not comparable to that of the other constituents, stating that unlike in other cases, 'one cannot derive the choice of [TH-TAM and NEGATION] inflection [on motion adverbs] directly from the clausal semantics: the only plausible source is direct agreement with the head verb' (Evans 2003:223). The argument hinges on a semantic analysis of sentences like (6.94).

(6.94)	*Niy-a*	*kuujuu-j-arra-*	*thaa-th-arr.*
	ŋi-a	kuːcuː-c-ŋara-ø	t̪aa-t̪-ŋara-ø
	3sg-T	swim-TH-fCONS-T	"return"-TH-fCONS-T
	3sg-Ø	swim-Ø-PST-Ø	"return"-Ø-PST-Ø

'He went off for a swim.' (Evans 2003: 223.ex.10)

Evans observes that in a sentence like (6.94), 'the swimming is clearly located in the past,

[50] The second meaning here is not listed by Evans (1995a), but it is found for example in *baaja waratha* 'kiss OBJ goodbye, before OBJ leaves' (cf *baa-j-* 'kiss').

but the “returning” need not be (a narrator could go on, for example, to say that the subject had, unexpectedly, yet to return)’ (2003:223). From this observation, the conclusion is drawn that *thaatharr* is not (or not necessarily) a semantically ‘past tense’ adverb, and consequently that its morphosyntactic past TH-TAM inflection merely repeats the TH-TAM:past feature associated with the head verb. If I understand Evans correctly, the crucial comparison is with a conceivable alternative, in pseudo-Kayardild, where the ‘future’ meaning of *thaa-th-* is reflected faithfully in its TH-TAM inflection, so that *thaa-th-* would inflect not for TH-TAM:past but for TH-TAM:potential.

Two points can be raised in response to this. Firstly, even if the premise regarding the meaning of *thaatharr* is correct and it is potentially a ‘future’ adverb, it does necessarily follow that *thaatharr* fails to acquire its TH-TAM:past feature on the basis of clause-level semantics — for the argument to go through, one would need to prove that the compositional semantics of Kayardild yields something other than a past tense clause when confronted with a past tense head verb and a semantically ‘future tense’ adverb.[51] Second, and more importantly, there is a compelling reason to believe that *thaatharr* is not a ‘future tense’ adverb at all, but past tense adverb. As Evans documents in his Grammar (1995a: 308), the stem form *thaa-th-* when used as an adverb does not mean ‘return’, but rather ‘go and V, expecting to return’. Just as the meanings of English main verb *have* and auxiliary *have* are different, so too are the meanings of Kayardild main verb *thaa-th-* and motion-adverbial *thaa-th-*. In (6.94), where *thaa-th-* is an adverb, it is true that in the past, the subject ‘went and V-ed, expecting to return’, and consequently there

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[51] An equivalent observation is made by Corbett (2006:140).

is no reason to believe that there is anything anomalous or special about the past TH-TAM value of *thaa-th-* in (6.94), or more generally, that motion adverbs inflect according to principles any different from those in operation elsewhere in the clause.

6.6 The DP

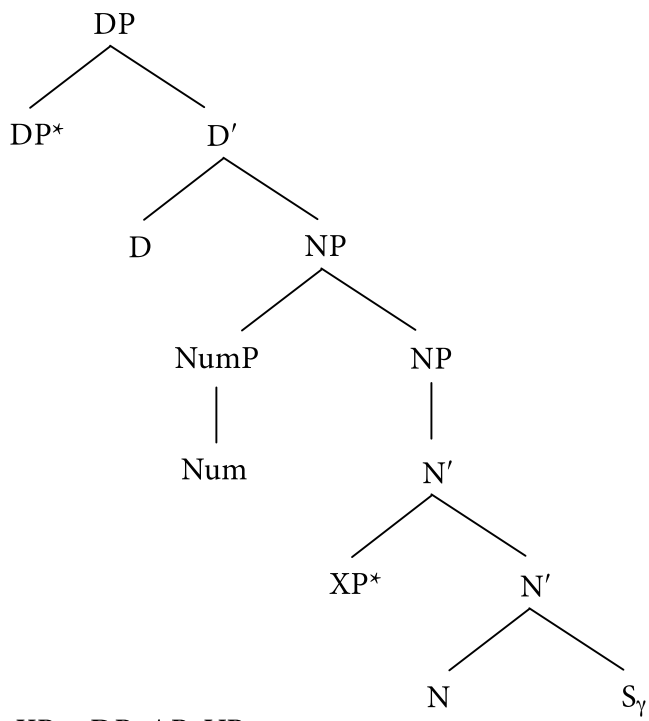
The Kayardild determiner phrase is contiguous, and word order within it is rigid. The analysis of the DP adopted here is comparable to Evans' (1995a) analysis of the 'NP', shown in (6.95), though it does not include the final 'modifier' position.

(6.95) The Kayardild NP, after Evans (1995a).

$\underbrace{\text{Determiner Number Qualifiers}}_{\text{Modifiers}}$ Head Modifier

The DP structure recognised here is shown in (6.96). Both the D head and the DP in [Spec DP] correspond to Evans' determiner position. The Num head of the NumP adjunct of NP corresponds to Evans' number position, and the XP modifiers of NP corresponds to Evans' qualifier positions. The N head of NP corresponds to Evans' head position. On S complements of N, see §6.5.2 above.

(6.96)



XP = DP, AP, VP

This section on the DP is organised as follows: §6.6.1 presents arguments for the existence of the DP constituent; §6.6.2 and §6.6.3 examine filled and unfilled structural positions within DP; §6.6.4 discusses the status of pronouns; §6.6.5 examines the concord of CASE within DP; §6.6.6 examines the concord of NUMBER within DP and within NP; and §6.6.7 reviews some complications regarding CASE:locative and its realisation.

6.6.1 Arguments for the existence of DP

Many Australian languages freely permit the apposition of multiple, co-referential, nominal constituents within the same clause (Blake 1987:92,106; Sadler & Nordlinger 2006a) and this is also true of Kayardild (see Evans (1995a:250–51); §6.8). Given that such multiple, co-referential nominal constituents can be adjacent to one another, one might question the need to posit a DP constituent at all. While the argument that there is no evidence for DP (or NP) can be upheld for some Australian languages (e.g. Kalkutungu, Blake 1979; 1983; Warlpiri, Hale 1981; Jiwarli, Austin 2001), this is not the case for Kayardild, in which clear evidence can be found for DP, from the fixed interpretation of nominal words based upon their position within the phrase (Evans 1995a:233–35; see also similar arguments with respect to Gooniyandi in McGregor 1990; and Martuthunira in Dench 1995). Consider the two syntactic collocations in (6.97a,b), which are reliably interpreted along the lines indicated. (Crucially here, possessive pronouns like *niwanda* are among the set of polyfunctional nominal stems whose existence was mentioned in §6.4.8.)

(6.97)	a.	*ni-wan-da*	*kiyarrng-ka*		*thabuju-*
		ŋi-paɲ-ta	kiarŋ-ka		t̪apucu-a
		3sg-fPOSS-T	two-T		e.Br-T
		3sg-POSS-Ø	two-Ø		e.Br-Ø
		‘his two elder brothers’ [E236]			
	b.		*kiyarrng-ka*	*ni-wan-da*	*thabuju-*
			kiarŋ-ka	ŋi-paɲ-ta	t̪apucu-a
			two-T	3sg-fPOSS-T	e.Br-T
			two-Ø	3sg-POSS-Ø	e.Br-Ø
		‘two of his elder brothers’ [E236]			

The reliability of the interpretations of (6.97a,b) stem from the fact that within a DP, numbers follow determiners but precede modifiers. The possessive pronoun *niwanda* is a determiner in (6.97a), but a modifier in (6.97b). Likewise, the reliable interpretations of (6.98a,b) stem from the fact that modifiers precede a head.

(6.98)	a.	*ngij-in-da*	*ni-da*	*wuran-d*	b.	*ngij-in-da*	*wuran-da*	*ni-d*
		ŋicu-iɲ-ta	ɲit̪-ta	wuɻan-ta		ŋicu-iɲ-ta	wuɻan-ta	ɲit̪-ta
		1sg-fPOSS-T	name-T	animal-T		1sg-fPOSS-T	animal-T	name-T
		1sg-POSS-Ø	name-Ø	animal-Ø		1sg-POSS-Ø	animal-Ø	name-Ø
		'my totem animal' [E236]				'my totem name' [E236]		

Data such as (6.97) and (6.98) support the conclusion that nominal words appear within contiguous units, inside of which function is restricted according to relative linear order. In other words, a structural unit exists, within which nominal words are organised. That structural unit is referred to here as the DP. Presumably too, although the language permits the occurrence of adjacent, co-referential DPs, the default interpretation of a string of adjacent nominal words in Kayardild is that they comprise a single DP, if their functions admit of that analysis.

Let us next condiser the reason for omitting Evans' post-head *modifier* position from the DP. The constituent which occupies this putative postion may be a determiner, number or a qualifier;[52] although it cannot be a 'head' this only results from the *a priori* assumption that a phrase is only permitted one head. As such, the putative, post-head *modifier* position fails in any way to restrict the function of the nominal word which fills it, and hence the constituent in that position could equally be analysed as occupying an

[52] Kayardild thus differs from languages like Gooniyandi (McGregor 1990) and Martuthunira (Dench 1995) in which a single, post-head position in a NP is functionally distinct from other positions, and so can be argued to be part of the NP.

adjacent, co-referential, apposed DP — the assumption adopted here. (On DP apposition generally, see §6.8.)

6.6.2 Filled structural positions in DP

DPs regularly contain overt D, Num and N heads. This section exemplifies DPs whose other positions are filled: (i) by DPs in [Spec, DP] position; (ii) by APs, DPs and VPs in the NP-internal, pre-head, modifier position.

The [Spec, DP] position can be filled by DPs which take the genitive CASE, as shown in (6.99), or the ablative, as in (6.100).[53,54] In examples, the words of constituents of interest appear in bold type, while relevant constituent structure is shown via brackets and subscripted labels (at the left edge).

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[53] On the semantic difference between genitive and ablative possession, see Evans (1995a: 143–44,51–52).

[54] Evans (1995a: 210) reports that certain CASE:origin DPs can function as determiners (i.e., in present terms, as [Spec DP]), but no examples are given and I have not been able to find any in my corpus. Given that a DP without an overt determiner can be interpreted as definite, it is possible that the kind of DP which Evans refers to contain a DP modifier (i.e., sister of N′) inflected for CASE:origin, within a matrix DP which is interpreted as definite.

(6.99) Embedded genitive DP as [Spec, DP]

[$_{DP}$[$_{DP}$ ***thabuju-karra***] [$_{D'}$[$_{NP}$[$_{NumP}$ *kiyarrng-ka*] [$_{NP}$ *maku-*]]]]

ṯapucu-kara kiarŋ-ka maku-a

e.Br-fGEN.T two-T wife-T

e.Br-GEN two-Ø wife-Ø

'elder brother's two wives' [E240]

(6.100) Embedded ablative DP as [Spec, DP]

[$_{DP}$[$_{DP}$ ***warngiij-i-na-*** ***dangka--na-***] [$_{D'}$[$_{NP}$ *dulk-*]]]

waɻŋi:c-ki-naa-ø ṯaŋka-ki-naa-ø ṯulk-ka

one-fLOC-fABL-T person-fLOC-fABL-T country-T

one-Ø-ABL-Ø person-Ø-ABL-Ø country-Ø

'one people's country' [R2005-aug08]

A pre-head, modifier AP within NP is shown in (6.101). Example (6.102) contains three such APs in a DP inflected for A-TAM:instantiated.

(6.101) Embedded AP as NP-internal, pre-head modifier

[$_{DP}$[$_{NP}$[$_{NumP}$ *kiyarrng-ka*] [$_{NP}$[$_{N'}$[$_{AP}$ ***kunya-a***] [$_{N'}$[$_{N}$ *kuna~wun-*]]]]]]

kiarŋ-ka kuɲa-a kuna-kuna-ø

two-T small-T ‹child$_{NL}$-child$_{NL}$›-T

two-Ø small-Ø ‹child›-Ø

'two small children' [E1984-05-01]

(6.102) Three embedded APs as NP-internal, pre-head modifiers

[$_{DP}$[$_{NP}$[$_{N'}$[$_{AP}$ ***mudin-kiy-a***] [$_{AP}$ ***jungarrba-y-a***] [$_{AP}$ ***bardangu-y-a***]
mutin-ki-a cuŋarpa-ki-a paʈaŋu-ki-a
tied together-fLOC-T big-fLOC-T large-fLOC-T
tied together-INS-Ø big-INS-Ø large-INS-Ø

[$_{N'}$[$_{N}$ *kurda-y-*]]]]]].
kuʈa-ki-a
coolamon-fLOC-T
coolamon-INS-Ø
'in the great big, bound coolamon' [R2005-aug02a]

Example (6.103) illustrates a DP as modifier in NP, while (6.104) shows a DP and a VP modifier of NP, within a DP inflected for A-TAM:future.

(6.103) Embedded DP as NP-internal, pre-head modifier

[$_{DP}$[$_{NP}$[$_{NumP}$ *kiyarrng-ka*] [$_{NP}$[$_{N'}$[$_{DP}$ ***mala-waan-da***] [$_{N'}$[$_{N}$ *yakuriy-a*]]]]]]
kiarŋ-ka mala-waːɲ-ta jakuɻi-a
two-T sea-fORIG-T fish-T
two-Ø sea-ORIG-Ø fish-Ø
'two marine fish' [E244]

(6.104) Embedded VP as NP-internal, pre-head modifier

[$_{DP}$[$_{NP}$[$_{N'}$[$_{DP}$	***bath-u-***][55]	[$_{VP}$ ***barji--n-ku-***]	[$_{N'}$[$_{N}$ *warrku-uru-*]]]]]
	paṯ-kuu-ø	paɻci-c-n-kuu-ø	warku-kuɻu-ø
	west-fPROP-T	set-TH-fN-fPROP-T	sun-fPROP-T
	west-FUT-Ø	set-Ø-PROG-FUT-Ø	sun-FUT-Ø

'(with) the setting sun in the west'

6.6.3 Unfilled structural positions in DP

The next set of examples illustrates cases where the head positions D, Num and N in DP fail to be overtly filled.

Examples like (6.105), where neither the D nor the Num position is filled, are common.

(6.105) No overt D or Num

[$_{DP}$[$_{NP}$[$_{N'}$[$_{AP}$	***Mirra-a***]	***dulk-a***]]]	*nga-la-wa-*	*dana-th-urrk-.*
	mira-a	ʈulk-ka	ŋa-la-pa-ø	ʈana-ṯ-kurka-ø
	good-T	country-T	1-pl-COMP-T	leave-TH-fLOC.fOBL-T
	good-Ø	country-Ø	1-pl-COMP-ø	leave-Ø-IMMED.COMP-Ø

'We left the good country.' [R2005-aug03]

When we turn to the N head of NP, the situation is not entirely parallel. For most positions in DP, if the position goes unfilled, the interpretation is simply that the speaker has chosen not to convey any meaning associated with that position. However, when the

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[55] Although compass locational nominals like *bath-* can also be used as determiners (Evans 1995a: 209–10,39), the DP *bathu* here is a modifier, describing the sun rather than picking out one among several possible 'sun' referents. (It is not part of the embedded VP; if it were, it would inflect for an A-TAM:continuous feature associated with the embedded clause as well as the A-TAM:future feature of the matrix clause.)

N head of NP is not overtly filled, the assumption is that the meaning associated with its position is recoverable from context (cf arguments by McGregor (1990:254–55) with respect to Gooniyandi; for the importance of this fact in DP apposition, cf §6.8). As Evans states, DPs lacking a filled N head of NP only occur when ‘extralinguistic or discourse context makes reference clear’ (Evans 1995a: 236). The highlighted DPs in (6.106) entirely lack an overt NP, while in (6.107)–(6.109) the NP position is represented only by an adjunct or modifier.

(6.106) No overt NP; D only

Jatha-a	*kamarr-,*	*bana*	[$_{DP}$ ***jatha-a***],	*bana*	[$_{DP}$ ***jatha-a***].
caṯa-a	kamar-a	pana	caṯa-a	pana	caṯa-a
other-T	rock-T	and.T	other-T	and.T	other-T
other-Ø	rock-ø	and	other-Ø	and	other-Ø

‘Another rock, and another, and another.’ [R2005-jun29]

(6.107) NP contains just a NumP adjunct; D also present

[$_{DP}$ ***Dan-da***	[$_{NP}$[$_{NumP}$ ***kiyarrng-k***]]],	*burldamurr-a*	*kuna~wun-*
ṯan-ta	kiarŋ-ka	puɻɻamur-a	kuna-kuna-ø
this-T	two-T	four-T	‹child$_{NL}$-child$_{NL}$›-T
this-Ø	two-Ø	four-Ø	‹child›-Ø

‘These two (people) had four children.’ [R2005-jul05b]

(6.108) NP (and DP) contains just a NumP adjunct

Nga-da	*diya-j-u-*	[$_{DP}$[$_{NP}$[$_{NumP}$ ***warngij-u-***]]].
ŋaṯ-ta	ṯia-c-kuu-ø	waɻŋic-kuu-ø
1sg-T	eat-TH-fPROP-T	one-fPROP-T
1sg-Ø	eat-Ø-POT-Ø	one-FUT-Ø

‘I’ll drink one (can)’ [E236.ex.6-8]

(6.109) NP (and DP) contains just a modifier

Nying-ka	[$_{DP}$[$_{NP}$[$_{N'}$[$_{AP}$ ***jungarrba***-]]]]	*kurrka-th !*
ɲiŋ-ka	cuɲarpa-ø	kurka-t̪a
2sg-T	big-T	take-TH.T
2sg-∅	big-∅	take-IMP

'You take a big one (a sheaf of grass)!' [R2007-may29]

A point to note in passing is that DPs lacking N heads are fully interpretable by the grammatical system as a whole. Not only is their reference resolved by recourse to context — making them referential just like other, comparable DPs with overt N heads, but they also have a semantic/grammatical role. This in turn means that they can be fit into the non-surface syntax just like any other DP — they assume the default syntactic position that corresponds to their semantic/grammatical role (cf §6.5.4.2). Thus, the DPs without N heads in (6.106) and (6.107) are subjects, and consequently they are daughters of S_{α} and so escape inflection for A-TAM; the DPs without N heads in (6.108) and (6.109) are direct objects, and consequently they are complements of V. In (6.108), where the clause is associated with the A-TAM:future value, the direct object DP inherits it and inflects for A-TAM:future; in (6.109) where the TH-TAM:imperative clause associates with no A-TAM value, the direct object DP remains uninflected for A-TAM.

6.6.4 Personal pronouns

Personal pronouns are analysed here as nominal words which can function as D, N or A heads. As a D head, a possessive or a plain personal pronoun functions as a determiner, as illustrated in (6.110a,b).

(6.110) Possessive pronoun as D

a.	[DP[D′ ***ni-wan-da***	[NP *dulk-*]]]	b.	[DP[D′ ***niy-a***	[NP *dangka-a*]]]
	ŋi-paɲ-ta	ʈulk-ka		ŋi-a	ʈaŋka-a
	3sg-fPOSS-T	country-T		3sg-T	man-T
	3sg-POSS-Ø	country-Ø		3sg- Ø	man-Ø
	'his/her country'			'that man'	

As an A head, a possessive pronoun projects an AP which functions as a modifier of N, as in (6.97b) above.

Personal pronouns are arranged into paradigms distinguishing person, number, and possession and one might at first suppose that these are each morphosyntactic features. However these pronominal features play no role in the syntax: there are no syntactic constructions that subcategorise for pronouns with certain features, and nothing external to the pronoun agrees with those features.[56] On the analysis advocated here, pronominal paradigms are paradigms of stems, not of inflected forms. For further discussion of pronominal stems, see Ch.3 §3.6.4.

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[56] Evans (2003: 221) suggests that the selection of COMP features in complementised clauses could be viewed as 'agreement in person' between the clause as a whole and its subject. Recall from §6.5.1 that in (in)subordinated clauses, COMP:empathy is used if the subject of a clause is first person inclusive, or if it is second person and 'the speaker wants to group him/herself with the addressee' (Evans 1995a: 494); COMP:plain is used otherwise. I would argue against this being person agreement particularly given that the 'agreement' is indeterminate in the case of second person. Rather, the determining factor is a semantically defined feature, call it 'empathy', which correlates fairly well, but not perfectly with person values.

Pronouns of course do inflect for true morphosyntactic features. In (6.111) for example the third singular possessive pronoun inflects for NUMBER:dual, CASE:ablative and A-TAM:instantiated.

(6.111)	*ni-wan-jiyarrng-ki-naba-y-a*	*jibarna-yarrng-ki-naba-y-a*
	ŋi-paɲ-kiarŋ-ki-napa-ki-a	cipaɳa-kiarŋ-ki-napa-ki-a
	3sg-fPOSS-fDU-fLOC-fABL-fLOC-T	MoBr in law-fDU-fLOC-fABL-fLOC-T
	3sg-POSS-DU-Ø-ABL-INS-Ø	MoBr in law-DU-Ø-ABL-INS-Ø
	'by his two uncles' [E480.ex.11-64]	

6.6.5 Concord of CASE in DP

CASE always exhibits concord within DP, and accordingly CASE features are analysed as attaching in the non-surface syntax to the DP node. A *prima facie,* possible exception to this relates to sets of identically CASE-marked, juxtaposed DPs (including appositive DPs, conjoined DPs and so forth). In §6.8.4 the hypothesis will be considered but rejected, that CASE might sometimes attach not to DPs but to something like a 'juxtapositional phrase' that dominates multiple, juxtaposed DPs in the non-surface syntax.

6.6.6 Concord of NUMBER in either DP or NP

Empirical motivation for the NP node inside DP comes from NUMBER inflection. The two NUMBER values, NUM:dual and NUM:plural, exhibit complete concord either within DP, as shown in (6.112)–(6.113) or within NP, as shown in (6.114)–(6.115).

(6.112) Concord of NUMBER:dual in DP

Dan-da	*ra-yin-d,*	[DP ***ngij-in-jiyarrng-ka***	[NP ***thabuju-yarrng-k***]]] .
ṯan-ta	ɹa-in-ta	ŋicu-iɲ-kiarŋ-ka	ṯapucu-kiarŋ-ka
here-T	south-fFRM-T	1sg-fPOSS-fDU-T	e.Br-fDU-T
here-Ø	south-ABL-Ø	1sg-POSS-DU-Ø	e.Br-DU-Ø

‘Here from the south (come) my two elder brothers.’ [W1960]

(6.113) Concord of NUMBER:plural in DP

Jina-a	[DP ***ngum-ban-bala***	[NP ***karndi-wala***]]] *?*
cina-a	ŋuŋ-paṉ-pala	kaɳṯi-pala
where-T	2sg-fPOSS-fPL.T	wife-fPL.T
where-Ø	2sg-POSS-PL	wife-PL

‘Where are your wives?’ [E184.ex.1-163]

(6.114) Concord of NUMBER:dual in NP only

[DP *Nga-rr-wan-da*	[NP ***kuna~wuna-yarrng-ka***]]]	*kurrkaa--j.*
ŋa-r-paɲ-ta	kuna-kuna-kiarŋ-ka	kurka-i-ṯa
1-du-fPOSS-T	‹child$_{\text{NL}}$-child$_{\text{NL}}$›-fDU-T	take-fMID-TH.T
1-du-POSS-Ø	‹child›-DU-Ø	take-MID-ACT

‘Our two children were taken.’ [R2005-jul15a]

(6.115) Concord of NUMBER:plural in NP only

[DP *Dathina*	[NP ***ngambu-wala***]]]	*dulma~dulmarr-a*
ṯaṯina	ŋampu-pala	ṯulmar-ṯulmar-a
that.T	well-fPL.T	‹boss-boss›-T
that	well-PL	‹bosses›-Ø

ngambura-tha	*muri-nguni-y-.*
ŋampuɹa-ṯa	muɻi-ŋuni-ki-a
dig well-TH.T	shell-fINST-fLOC-T
dig well-ACT	shell-INST-INS-Ø

‘The bosses of country dug those wells with baler shells.’ [R2005-jul19a]

In DPs which contain a NumP adjunct to NP, NUMBER is only ever attested within NP, as illustrated in (6.116)–(6.117). The Num head itself will not inflect for NUMBER.[57,58]

(6.116) Concord of NUMBER:dual in NP only, in the presence of NumP

[$_{DP}$[$_{NP}$[$_{NumP}$	*Kiyarrng-ka*]	[$_{NP}$ ***maku-yarrng-k***]]] .
	kiarŋ-ka	maku-kiarŋ-ka
	two-T	female-fDU-T
	two-Ø	female-DU-Ø

‘There were two girls.’ [R2005-jun29]

(6.117) Concord of NUMBER:plural in NP only, in the presence of NumP

[$_{DP}$[$_{NP}$[$_{NumP}$	*Mutha-a*]	[$_{NP}$ ***wakatha-wala***]]]	*ki-rr-wan-ju-*
	muṯa-a	wakaṯa-pala	ki-r-paɲ-kuu-ø
	many-T	sister-fPL.T	2-du-fPOSS-fPROP-T
	many-Ø	sister-PL	2-du-Ø-FUT-Ø

marmirrayi-j-u-.
maɻmirai-c-kuu-ø
look after-TH-fPROP-T
look after-Ø-POT-Ø
‘Many sisters will look after you.’ [R2005-jul15a]

Since these facts do not appear to derive from any general principles of Kayardild inflection, a specific analysis of them is proposed as follows. NUMBER features attach initially to the lowest NP node within the NP complement of D. Then, before percolation

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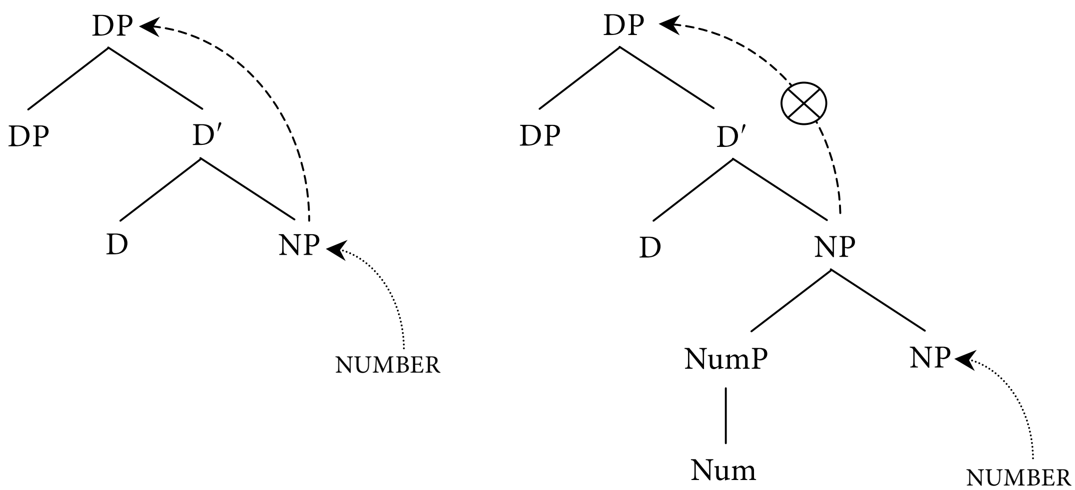
[57] Evans (1995a: 183) makes this observation for NUMBER:plural in combination with the Num head *mutha-* ‘many’, but not for NUMBER in general.

[58] I do not have any examples of NUMBER-inflected NPs within DPs that contain both a Num head and a determiner (eg ‘my two girls-DU’).

takes place, any NUMBER feature attached to the sister node of D (i.e., its complement) is optionally copied to the DP node. The results of this are illustrated in (6.118).

(6.118) No NumP adjunct present, optional copying can occur — NumP adjunct is present, copying cannot occur



If no NumP adjunct is present then the NP node bearing the NUMBER feature is sister of D and the feature is available to be optionally copied to DP. However, if the NumP adjunct is present, then the NP node bearing the NUMBER feature is too low for copying to occur.

6.6.7 DPs with locative CASE

It can be difficult to distinguish in Kayardild between DPs which inflect for CASE:locative and those which are unspecified for CASE, the main reason being that CASE:locative is realised by the formal locative (fLOC), whose own possibilities for overt realisation are tightly restricted. To recap what was outlined in §6.2.8 and §6.2.9, every inflectional fABL or fALL suffix must be preceded by a ligative fLOC suffix — these fLOC suffixes do not realise CASE:locative. Besides that, any non-ligative fLOC suffix must appear last in the word (apart from the termination, T, which will follow it). This means that fLOC appears either (i) as a ligative suffix before fABL or fALL; (ii) last in the word, as the realisation of a morphosyntactic feature, with the underlying form of /ki/; or (iii) last in the word, as the realisation of a morphosyntactic feature, in the cumulative fLOC.fOBL morph /kurka/. There are no other circumstances under which fLOC can surface. Since CASE suffixes are often followed by other suffixes (particularly A-TAM), meaning that they are not last in the word, the fLOC suffix which might otherwise realise CASE:locative simply fails to surface in most instances.

The aim of this section is to present two basic observations. The first, set out in §6.6.7.1 is that CASE:locative DPs, hard as they are to find, do actually exist, albeit with the complication that CASE:locative often alternates freely with CASE:Ø. The second, in §6.6.7.2, is that in addition to the purely formal restrictions on the surfacing of fLOC, there exists another layer of restrictions inhibiting the overt realisation of CASE:locative, even in situations where on formal grounds alone, it would be expected to surface.

6.6.7.1 Confirmed CASE:locative DPs

Confirmed instances of CASE:locative DPs are rare,[59] but they do occur. An appropriate place to search for CASE:locative DPs is in clauses which contain no A-TAM or COMP

[59] There are several DP types reported by Evans (1995a: 334–38) as taking CASE:locative, for which I have been unable to locate any evidence that they do not merely take CASE:Ø.

features, of which there are two types: clauses associated with with TH-TAM:imperative and with TH-TAM:resultative (cf §6.1.3).[60] When we do find CASE:locative DP types in these environments, several of them alternate freely between CASE:locative and CASE:Ø. The first such type is pronominal direct object pronouns, which can appear with CASE:locative, or with CASE:Ø (Evans 1995a: 109). An example is shown in (6.119).

(6.119)	*Dana-tha*	***ngij-in-ji-***	/	***nga-d !***
	ṯana-ṯ-a-	ŋicu-iɲ-ki-a		ŋaṯ-ta
	leave-TH.T	1sg-fPOSS-fLOC-T		1sg-T
	see-IMP	1sg-Ø-LOC-Ø		1sg-Ø
	'Leave me!' [E109.ex.3-35]			

Likewise, DPs denoting locations can take CASE:locative, (6.120)–(6.121), or CASE:Ø, (6.122).[61]

These are: (i) 'locative of time' DPs (1995a:140), cf the more complex situation summarised in §6.5.4.2; (ii) 'ambient cause' DPs (1995a:140, where the semantics of ex.4-22 suggests fLOC be analysed as COMP:empathy on a focus DP); (iii) 'manner' DPs (1995a:141); (iv) contrastive DPs (1995a:141); (v) DPs of 'adversely affected' arguments (1995a:141); (vi) non-human demoted subjects in passive clauses (1995a:350), though see also the discussion in §6.5.5.1.

[60] Embedded resultative clauses can inherit A-TAM from a matrix clause but do not associate with an A-TAM feature of their own.

[61] CASE:Ø location DPs are daughters of VP_β (cf Appendix B, §B.4.1); the CASE:locative DPs must be below VP_α (Appendix B, §B.1).

(6.120)	*Narrkiri-j-a*	*mala-a*	***ngarn-ki-*** *!*		
	ŋarkiɻi-ca	mala-a	ŋaɳ-ki-a		
	bury-TH.T	beer-T	beach-fLOC-T		
	bury-IMP	beer-Ø	beach-LOC-Ø		

‘Bury the beer on the beach!’ [E744]

(6.121)	***Mutha-y-a***	***ngambirr-i-***	*wirdi-jirrin-d.*		
	mut̪a-ki-a	ŋampir-ki-a	wiʈi-c-iriɲ-ta		
	many-fLOC-T	house-fLOC-T	stay-TH-fRES-T		
	many-LOC-Ø	house-LOC-Ø	stay-Ø-RES-Ø		

‘They have stayed in many houses.’ [E476.ex-11-49]

(6.122)	*Ki-l-da*	*warra--na*	*jirrkurii--na*	***wambal-da***	*wanjii--n!*
	ki-l-ta	wara-c-na	cirkuɻiː-c-na	wampal-ta	waɲciː-c-na
	2-pl-T	go-TH-fNEG.T	go north-TH-fNEG.T	bush-T	ascend-TH-fNEG.T
	2-pl-Ø	go-Ø-NEG.IMP	go north-Ø-NEG.IMP	bush-Ø	ascend-Ø-NEG.IMP

‘Don’t you (all) go up north into the bush!’ [W1960]

The only DPs which obligatorily take CASE:locative are certain arguments of three-place predicates. Three-place predicates in Kayardild select from six possible case frames (Evans 1995a: 334–38), of which case frames 1 and 6 contain a CASE:locative argument. The boldface ‘destination’ DPs in (6.123)–(6.124) occur in Evans’ case frame 1,[62] the ‘theme’ DP in (6.125) is in case frame 6.

[62] At first glance it is tempting to analyse *wuu-j-* ‘put’ in (6.123)–(6.124) as a simple transitive verb, glossed as ‘transfer’, which takes a locative adjunct like those illustrated in (6.120)–(6.122), but this would fail to explain why the DPs in (6.123)–(6.124) take CASE:locative obligatorily, compared those in (6.120)–(6.122) for which CASE:locative is optional.

(6.123)

Kaburrba-y-a	*wuu-ja*	*wuran-da*	*karna-j!*
kapurpa-ki-ø	wuː-ca	wuɻan-ta	kaɳa-ca
coals-fLOC-T	put-TH.T	food-T	cook-TH.T
coals-LOC-Ø	put-IMP	food-Ø	cook-IMP

'Put the food on the coals, cook it!' [E335.ex.9-87]

(6.124)

Yakuri-	*wuu-j-irrin-da*	***kaburrba-y-***
jakuɻi-ø	wuː-c-iriɲ-ta	kapurpa-ki-ø
fish-T	put-TH-fRES-T	coals-fLOC-T
fish-Ø	put-Ø-RES-Ø	coals-LOC-Ø

'The fish is/was put on the ashes.' [E476.ex.11-47]

(6.125)

Marraa-ja	*dangka-a*	***kurumbu-y-*** *!*
maraː-ca	ʈaŋka-a	kuɻumpu-ki-a
show-TH.T	man-T	spear-fLOC-T
show-IMP	man-Ø	spear-LOC-Ø

'Show the man the spear!' [E338.ex.9-101]

In sum, although they occur under restricted conditions only, the existence of true, CASE:locative DPs in Kayardild is confirmed.

6.6.7.2 Interactions of CASE:locative and A-TAM

When we turn to CASE:locative DPs which are inflected for A-TAM or COMP, complications arise which repeatedly serve to neutralise the formal contrast between CASE:locative DPs and CASE:Ø DPs. We can take COMP and A-TAM in turn.

There are two positive values taken by the feature COMP — COMP:empathy and COMP:plain. The COMP:empathy value is realised by fLOC. However, any DP which carries the features {CASE:locative, COMP:empathy} will be inflected with just one copy of the fLOC suffix, since a sequence fLOC-fLOC would violate the requirement that every fLOC suffix be last in the word if it realises a feature value. As such, the inflected {CASE:locative, COMP:empathy} DP will have exactly the same form (with just one fLOC suffix) as a {CASE:Ø, COMP:empathy} DP.

Notionally, a {CASE:locative, COMP:plain} DP would be distinct from a {CASE:Ø, COMP:plain} DP. COMP:plain is realised by fOBL, and we would expect a {CASE:locative, COMP:plain} DP to inflect with fLOC.fOBL /kurka/. However, the recall that DPs which inflect for COMP:plain will be either subjects or VP-internal DPs (and not topic or focus DPs). Subjects do not inflect for CASE:locative, and VP-internal DPs in a +COMP clause always inflect for A-TAM. As a result, there are no {CASE:locative, COMP:plain, A-TAM:Ø} DPs, only {CASE:locative, COMP:plain, A-TAM:*x*} DPs for some positive A-TAM value *x*. As we will see next, the presence of A-TAM will generally suppress the realisation of CASE:locative.

Moving along to A-TAM, for reasons which will be discussed further in §6.7 below, the presence of an A-TAM feature typically suppresses the overt realisation of CASE:locative, even when we would expect fLOC to be realised. In (6.126), emotive A-TAM is realised by fOBL, so all else equal, we would expect a CASE:locative DP to inflect with fLOC.fOBL /kurka/, but this is not the case: it inflects with fOBL only.

(6.126)	*Kurthurr-a*	*daraa--ny-arra-*	***ngambu-nth-***	(not ****ngambu-wurrk***).
	kuɻ̣tur-a	ṯaɻa-i-ṯ-ɲara-ø	ŋampu-in̪ṯa-ø	ŋampu-kurka-ø
	shin-T	break-fMID-TH-fAPPR-T	well-fOBL-T	well-fLOC.fOBL-T
	shin-Ø	break-MID-Ø-APPR-Ø	well-EMO-Ø	well-LOC.EMO-Ø

‘You might break your leg in the well.’ [W1960]

In general, the CASE:locative feature value will receive no overt realisation if the DP in question is a daughter of a VP or V′ node. Curiously, if the CASE:locative DP is the daughter of some other node — as it will be when it is embedded in another DP — then an overt realisation of CASE:locative does appear (if it obeys the restrictions on fLOC). An example is shown in (6.127).

(6.127)	*Kuna~wuna-*	*bilarri--nyarra-*	*nguku-ntha-*	[$_{\text{DP}}$[$_{\text{DP}}$ ***wuruman-kurrk***-]]
	kuna-kuna-ø	pilari-c-ɲara-ø	ŋuku-in̪t̪a-ø	wuɻuman-kurka-ø
	‹child$_{\text{NL}}$-child$_{\text{NL}}$›-T	spill-TH-fAPPR-T	water-fOBL-T	billy-fLOC.fOBL-T
	‹child›-Ø	spill-Ø-APPR-Ø	water-EMO-Ø	billy-LOC.EMO-Ø

‘The kid might spill the water (that is) in the billy.’ [E139.ex.4-18]

In (6.127) the DP *wurumankurrk* ‘in the billy’ is juxtaposed with *ngukuntha* ‘water’ and has the somewhat complex structure of a CASE:locative DP embedded inside another DP — this kind of structure is not uncommon in juxtapositional constructions, as will be discussed at some length in §6.8.5 below. What is important here, is that the CASE:locative DP itself is not a daughter of VP or V′. This may seem something of an abstruse condition on an equally abstruse pattern of (blocking of) morphological realisation, but as we will see in §6.7 next and in Ch.7 §7.2.3, there are certain ways in which the interaction between CASE:locative and A-TAM features mirrors the interactions that occur between A-TAM features, and TH-TAM and NEG.

6.7 Feature percolation

This section sets out in more detail than was previously provided, the nature of feature percolation, the mechanism proposed in §6.4.4 to regulate the transfer of morphosyntactic features from the non-surface syntactic nodes to which they first attach, down to the terminal nodes of the non-surface syntactic tree, which correspond to individual words. We begin with a review of some issues pertinent to Kayardild's realisational morphology, which is the component of the grammar that will have to interpret the feature structures which percolation generates.

6.7.1 Considerations from the realisational morphology

A question which must be addressed by any theory which relates the syntax of a language to its realisational morphology, is how much if any of the linear ordering that appears in the latter ought to be derived from the former, and how much ought to be a matter for the morphology alone. Without doubt, some languages exist in which morphological order corresponds in a non-trivial manner to syntactic structure, and Kayardild is among them. The basic empirical observation, that a parallel can often be found between the linear order of features' morphological realisations (from the lexical stem outwards) and the relative embedding of the syntactic objects with which the features are associated (from the root node of the syntactic tree downwards) is the core of Baker's (1985) Mirror Principle, Saddock's (1991) Linearity Constraints and Evans' (1995a:107) Concentric Scoping Principle which applies to Kayardild; it also figures in Anderson's (1992:94ff) Layering Principle, and falls out by default in Nordlinger's (1998) Constructive Case theory. On the other hand, there is no shortage of languages in which the relationship between the order of inflectional morphs and syntax is tenuous at best, and theories such as Paradigm Function Morphology (Stump 2001) do not assume any ordering to be supplied by the syntax. Although many languages' realisational morphology *could* be described in such a way as to relate morphological order to syntactic structure, few of them *must* be — though see Anderson (1992:94ff) for arguments why such analyses might be desirable even if not necessary. In the case of Kayardild though, there is no question: syntax will have to provide at least some information about ordering to the realisational morphology (a point also made by Sadler & Nordlinger 2006b).[63] The argument runs as follows.

In most cases, the relative order of the realisation of two feature values in Kayardild cannot be predicted on the basis of the identity of those values alone. The two words in (6.128a,b) are inflected for exactly the same feature values, yet the order is contrastive; the reason is that the word forms in (6.128a,b) correspond to different syntactic structures, summarised diagrammatically in (6.129a,b).

(6.128)	a.	*karndi-rnurru-walad*	b.	*karndi-wala-nurru-*
		kaɳʈi-ɳuru-palat̪-ta		kaɳʈi-palat̪-ɳuru-a
		wife-fASSOC-fPL-T		wife-fPL-fASSOC-T
		wife-ASSOC-PL-Ø		wife-PL-ASSOC-Ø
		'many (men) with wives'		'(man) with many wives' (E106.ex.3-23a,b)

[63] On Sadler & Nordlinger (2006b), see also §6.11 below.

(6.129) a. DP–D′–NP–N′–DP–D′–NP–N′–N *karndirnurruwalad*

NUM:pl CASE:assoc

b. DP–D′–NP–N′–N *karndiwalanurru*

{CASE:assoc, NUM:pl}

Diagrams in (6.129) display syntactic nodes that are superordinate to the terminal node (which corresponds to the word itself), from highest on the left to lowest on the right, and show the attachment of morphosyntactic feature values to those nodes.[64]

Examples such as (6.128a,b) show that morphological order is contrastive, but it does not yet prove that syntax absolutely must pass an ordered set of features to the morphology. It might be proposed (unsuccessfully as we will soon see) that the apparent ordering features is transmitted to the morphology by way of a 'diacritic' system. Suppose that Kayardild possesses not one but two CASE features, CASE_1 and CASE_2, and not one but two NUMBER features, NUM_1 and NUM_2, and likewise with all features that can be contrastively ordered. The contrast in (6.128a,b) would be between the feature set {CASE_1:assoc, NUM_2:pl} and {CASE_1:assoc, NUM_1:pl}. In the syntax we can say that '2' features are higher than '1' features, and in the realisational morphology we can say that the linear order of features' realisation must be NUM_1>CASE_1>NUM_2>CASE_2. Such an approach ought technically to succeed provided that the features it requires constitute a closed class. In fact though, the nature of recursive inflection in Kayardild, discussed in

[64] For further discussion of the embedded DP structure instantiated in (6.129a), see §6.8.5 below.

§6.10 below, suggests that the set of features required is, in principle at least, not a closed class. Although there may be upper bounds on the attested morphological complexity of Kayardild words, those bounds do not follow from restrictions on embedding and ordering; if all attested embedding and ordering patterns co-occurred in one structure, the resulting words would be tremendously complex (cf §6.10.2), and a very large number of features would be needed. Indeed, stepping back from the technical issues related to a diacritic analysis of morphosyntactic features, we can observe that such an analysis, even if it could be implemented, still seems fundamentally pointed in the wrong direction, for the same reasons that were cited in relation to the diacritic analysis of Kayardild non-surface syntax in §6.5.4.3: Kayardild inflection is fundamentally related to its syntactic structures, and its syntactic structures are recursive.

Let us suppose then that the syntax does communicate information about features' order in direct terms, by ordering them. Let us also suppose that in the default case, it communicates *all* of the ordering of feature values that follows from the hierarchical position of nodes to which features attach. In some cases, multiple features attach to a single node. CASE and NUMBER (after copying; cf §6.6.6) both attach to DP, and NEG and TH-TAM both attach to VP_{δ}. Should these be ordered by the syntax? To answer that question, let us consider a few more facts regarding morphological realisation.

The realisational morphology will need to deal with two basic issues when it comes to any pair of features: (i) what order those features are realised in if they are both realised in the same word form, but also (ii) whether or not they can actually both be realised in the same word form. Some pairs of features are antagonistic. We know from §6.6.7.2 that a CASE:locative feature attached to a DP node will not be realised along with an A-TAM feature attached to any VP node which dominates that DP via a chain of VP or V′ nodes. We also know that TH-TAM and NEG feature values are not realised together with an A-TAM value associated with the same clause — i.e., if the nodes to which they attach are separated by a chain of VP nodes. The analysis to be implemented here and in Ch.7 will make use of the notion of ordering to capture these facts: in the morphosyntactic feature structure generated by feature percolation, any two A-TAM, TH-TAM, NEG or CASE:locative feature values will be unordered if the nodes to which they attach are separated only by a chain of VP or V′ nodes, and in the realisational morphology, any two unordered features will be potentially antagonistic, such that the realisation of one suppresses the realisation of the other. Finally, since CASE and NUMBER features are never antagonistic in this fashion, it will be assumed here that even when they attach to the same DP node in the non-surface syntax, they are arranged within morphosyntactic feature structures as an ordered pair, NUM>CASE.

6.7.2 Feature percolation, precisely

Feature percolation will be construed here as process which calculates feature structures, F_i, which are associated with syntactic nodes, $\mathbf{n}_i$. These structures are distinct from the sets of features A_i which have attached (or in the case of NUMBER, been copied) to a node $\mathbf{n}_i$. The calculations themselves are defined in an iterative fashion, so that F_i depends not only on A_i but also on F_{i-1} — where F_{i-1} is the feature structure of associated with $\mathbf{n}_{i-1}$ and $\mathbf{n}_{i-1}$ is the node immediately superordinate to node $\mathbf{n}_i$. In this way, information will flow down the syntactic tree, from the root node to the terminals.

The calculation of F_i for any node $\mathbf{n}_i$ is sensitive to three factors: (i) whether or not $\mathbf{n}_i$ is an S node; (ii) whether or not $\mathbf{n}_{i-1}$ is a category V node (i.e., VP or V′); and (iii) the features attached to $\mathbf{n}_i$. Feature structures F_i will themselves consist of a partially ordered set of feature values, e.g. {CASE:assoc > A-TAM:fut, TH-TAM:pot > COMP:plain}. Their contextually sensitive calculations are given in (6.130), and examples follow.

(6.130) Calculation of F_i

	Context	Calculation of F_i, where $F_{i-1} = \{a>b...\}$
a.	$\mathbf{n}_i$ = S	if A_i contains a COMP feature then $F_i = A_i$, otherwise F_i is empty, except for any COMP value contained in F_{i-1}.
b.	else, if $\mathbf{n}_{i-1}$ = VP or V′	A-TAM, TH-TAM, NEG & CASE:locative features in A_i are added to F_{i-1}, ordered before *b* but unordered with respect to *a*
		NUM & all other CASE features in A_i are added to F_{i-1}, ordered before *a*, with NUM before CASE
c.	else	all features in A_i are added to F_{i-1}, ordered before *a*, with NUM before CASE

6.7.3 Example derivations

The examples below which will illustrate the application of feature percolation are each arranged into two sections. The upper section displays a list of nodes, from the highest at the left to the terminal at the right; and beneath them the features A_i which attach to them. The lower section displays a list, containing just those nodes $\mathbf{n}_i$ at which $F_i \neq F_{i-1}$; below them is given an indication of which calculation process (a., b., or c. in (6.130)) applies at $\mathbf{n}_i$; and below that, F_i itself is shown.

Examples (6.131) and (6.132) show the application of feature percolation to the words *karndiwalanurru* and *karndirnurruwalada* from (6.128) above. Example (6.131) shows the default ordering of NUM>CASE for features attached to the same DP node, while (6.132) shows the linear order, mimicking hierarchical order, that results from the percolation of features attached to different DP nodes.

(6.131) Feature percolation for:
karndiwalanurru {NUM:pl > CASE:assoc} in (6.128a)

All nodes	
n$_i$:	DP–D′–NP–N′–N
A$_i$:	{CASE:assoc, NUM:pl}
Nodes at which $F_i \neq F_{i-1}$	
n$_i$:	DP
	c.
F_i:	{NUM:pl > CASE:assoc}

(6.132) Feature percolation for:
karndirnurruwalad {CASE:assoc > NUM:pl} in (6.128b)

All nodes			
n$_i$:	DP_1–D′–NP–N′–DP_2–D′–NP–N′–N		
A$_i$:	NUM:pl		CASE:assoc
Nodes at which $F_i \neq F_{i-1}$			
n$_i$:	DP_1	…	DP_2
	c.		c.
F_i:	{NUM:pl}		{CASE:assoc > NUM:pl}

Examples (6.134) and (6.135) show the lack of ordering between TH-TAM, NEG and A-TAM features which attach to VP nodes in the same clause. The words illustrated are *kurrinangku* and *bijarrbawu* in (6.133).

(6.133) *Yurdanjiy-a* *makuw-a* ***kurri--nang-ku-*** ***bijarrba-wu-.***
jutaɲci-a maku-a kuri-c-naŋ-kuu-ø picarpa-kuu-ø
pregnant-T woman-T see-TH-fNEG-fPROP-T dugong-fPROP-T›
pregnant -Ø woman-Ø see-Ø-NEG-POT-Ø dugong-FUT-Ø
'Pregnant women mustn't look at the dugong.' [R2005-jun29]

(6.134) Feature percolation for:
kurrinangku {A-TAM:fut, TH-TAM:pot, +NEG}

All nodes		
n$_i$:	S_γ–S_β–S_α–VP_δ–VP_γ–VP_β–VP_α–VP_ω–VP_ψ–V′–V	
	|	|
A$_i$:	{TH-TAM:pot,+NEG}	{A-TAM:future}
Nodes at which $F_i \neq F_{i-1}$		
n$_i$:	VP_δ ...	VP_β
	c.	b.
F$_i$:	{TH-TAM:pot, +NEG}	{A-TAM:fut, TH-TAM:pot, +NEG}

(6.135) Feature percolation for: *bijarrbawu* {A-TAM:fut, TH-TAM:pot, +NEG}

All nodes		
n$_i$:	S_γ–S_β–S_α–VP_δ–VP_γ–VP_β–VP_α–VP_ω–VP_ψ–V′–DP–D′–NP–N′–N	
	|	|
A$_i$:	{TH-TAM:pot,+NEG}	{A-TAM:future}
Nodes at which $F_i \neq F_{i-1}$		
n$_i$:	VP_δ ...	VP_β
	c.	b.
F$_i$:	{TH-TAM:pot, +NEG}	{A-TAM:fut, TH-TAM:pot, +NEG}

Example (6.137) shows the linear order, mimicking hierarchical order, that results between TH-TAM and A-TAM features associated with different clauses. The word illustrated is *diyanngarrbawu* in (6.76) above, repeated here as (6.136).

(6.136)

Kariya-th-u-	*jingkar-maru-th-u-,*	***diya--n-ngarrba-wu-***
kaɻia-t̪-kuu-ø	ciŋkaɻ-maɻu-t̪-kuu-ø	t̪ia-c-n-ŋarpa-kuu-ø
conceal-TH-fPROP-T	scrub-fDAT-TH-fPROP-T	eat-TH-‹N-fCONS›-fPROP-T
conceal-Ø-POT-Ø	scrub-DAT-Ø-POT-Ø	eat-Ø-‹ANTE›-FUT-Ø

janangkurri-ngarrba-wu-	*Murdumurdu-waan-ju-*
canaŋkuri-ŋarpa-kuu-ø	mut̪umut̪u-waːɲ-kuu-ø
goat-fCONS-fPROP-T	(place name)-fORIG-fPROP-T
goat-ANTE-FUT-Ø	(place name)-ORIG-FUT-Ø

'He will conceal in the scrub (the ones) from Murdumurdu who have eaten the goat.' [E1987-9-1]

(6.137) Feature percolation for:
diyanngarrbawu {A-TAM:ante, TH-TAM:ante > A-TAM:fut, TH-TAM:pot}

All nodes	
n*i*:	S$_\gamma$–S$_\beta$–S$_\alpha$–VP$_{\delta1}$–VP$_\gamma$–VP$_{\beta1}$–VP$_\alpha$–VP$_\omega$–VP$_\psi$–V′–DP–D′–NP–N′–...
	| |
A*i*:	{TH-TAM:pot} {A-TAM:future}
n*i*:	... VP$_{\delta2}$–VP$_\gamma$–VP$_{\beta2}$–VP$_\alpha$–VP$_\omega$–VP$_\psi$–V′–V
	| |
A*i*:	{TH-TAM:ante} {A-TAM:ante}

Nodes at which F$_i$ ≠ F$_{i-1}$							
n*i*:	VP$_{\delta1}$	...	VP$_{\beta1}$	...	VP$_{\delta2}$	...	VP$_{\beta2}$
	c.		b.		c.		b.
F*i*:	{TH-TAM:pot}		{A-TAM:fut, TH-TAM:pot}		{TH-TAM:ante > A-TAM:fut, TH-TAM:pot}		{ A-TAM:ante, TH-TAM:ante > A-TAM:fut, TH-TAM:pot}

Example (6.139) shows the lack of ordering between TH-TAM, A-TAM and CASE:locative features in the same clause, when the DP node to which CASE:locative attaches is the daughter of a V′ node. In the realisational morphology (Ch.7, §7.2.3.3), this lack of ordering will cause the realisation of CASE:loc to be suppressed. The word illustrated is *ngambunth* in (6.126) above, repeated here as (6.138).

(6.138)	*Kurthurr-a*	*daraa--ny-arra-*	***ngambu-nth-*** .
	kuɻtur-a	ʈaɻa-i-t̪-ɲara-ø	ŋampu-in̪t̪a-ø
	shin-T	break-fMID-TH-fAPPR-T	well-fOBL-T
	shin-Ø	break-MID-Ø-APPR-Ø	well-EMO-Ø
	'You might break your leg in the well.' [W1960]		

(6.139) Feature percolation for: *ngambunth* {CASE:loc, A-TAM:emo, TH-TAM:appr}

All nodes			
n$_i$:	S$_\gamma$–S$_\beta$–S$_\alpha$–VP$_\delta$–VP$_\gamma$–VP$_\beta$–VP$_\alpha$–VP$_\omega$–VP$_\psi$–V′–DP–D′–NP–N′–N		
A$_i$:	{TH-TAM:appr}	{A-TAM:emo}	{CASE:loc}
Nodes at which F$_i$ ≠ F$_{i-1}$			
n$_i$:	VP$_\delta$ ...	VP$_\beta$ ...	DP
	c.	b.	b.
F$_i$:	{TH-TAM:appr}	{A-TAM:emo, TH-TAM:appr}	{CASE:loc, A-TAM:emo, TH-TAM:appr}

In contrast to (6.139), example (6.141) shows the ordering between CASE:locative and TH-TAM/A-TAM which results when the DP node to which CASE:locative attaches is the daughter of an N′ node. In the realisational morphology, this will allow CASE:loc to be realised. The word illustrated is *wurumankurrk* in (6.127) above, repeated here as (6.140).

(6.140) *Kuna~wuna-* *bilarri--nyarra-* *nguku-ntha-* ***wuruman-kurrk***-.
kuna-kuna-ø pilari-c-ɲara-ø ŋuku-in̪t̪a-ø wuɻuman-kurka-ø
‹child$_{NL}$-child$_{NL}$›-T spill-TH-fAPPR-T water-fOBL-T billy-fLOC.fOBL-T
‹child›-Ø spill-Ø-APPR-Ø water-EMO-Ø billy-LOC.EMO-Ø
'The kid might spill the water (that is) in the billy.' [E139.ex.4-18]

(6.141) Feature percolation for: *wurumankurrk* {CASE:loc > A-TAM:emo, TH-TAM:appr}

All nodes	
n$_i$:	S_γ-S_β-S_α-VP_δ-VP_γ-VP_β-VP_α-VP_ω-VP_ψ-V′-DP-D′-NP-N′-DP-D′-NP-N′-N
A$_i$:	{TH-TAM:appr} (at VP_δ) {A-TAM:emo} (at VP_β) {CASE:loc} (at DP)

Nodes at which $F_i \neq F_{i-1}$					
n$_i$:	VP_δ	...	VP_β	...	DP
	c.		b.		c.
F$_i$:	{TH-TAM:appr}		{A-TAM:emo, TH-TAM:appr}		{CASE:loc > A-TAM:emo, TH-TAM:appr}

Finally, example (6.143) illustrates the percolation of features attached to S nodes. The word illustrated is *ngijuwa* in (6.58) above, repeated here as (6.142).

(6.142) *Dan-kiy-a* *kuna~wuna-y-a* *rika-walath-ij-iy-a*
ʈan-ki-a kuna-kuna-ki-a ɻika-palat̪-ic-ki-a
this-fLOC-T ‹child$_{NL}$-child$_{NL}$›-fLOC-T cold-‹fPL-fSAME›-fLOC-T
this-EMP-Ø ‹child›-EMP-Ø cold-‹EVERY›-EMP-Ø

ngiju-wa- *kari-j-uu-nth-!*
ŋicu-pa-ø kaɻi-c-kuu-in̪t̪a-ø
1sg-fCOMP-T cover-TH-fPROP-fOBL-Ø
1sg-COMP-Ø cover-Ø-POT-COMP-Ø
'I'll cover up *these children who are all cold*!' [R2005-jul19a]

(6.143)

Feature percolation for: *ngijuwa* {COMP:plain}			
All nodes			
n$_i$:	S_γ–S_β–S_α–DP–D′–NP–N′–N		
A$_i$:	{COMP:emp}	{COMP:plain}	
Nodes at which $F_i \neq F_{i-1}$			
n$_i$:	S_β	…	S_α
	a.		a.
F$_i$:	{COMP:emp}		{COMP:plain}

6.8 DP juxtaposition

This section examines the empirical nature of DP juxtaposition in Kayardild, and provides an analysis of it within the formal account of morphosyntax developed in this chapter. We can begin with a rough working definition of juxtaposition as in (6.144).

(6.144) Juxtaposition (initial definition)

> The co-occurrence within the clause of multiple DPs which share the same inflectional features, and some commonality in their semantic/grammatical role.

An initial example of juxtaposition is given in (6.145), in which the juxtaposed DPs are shown in boldface type (the polylexemic DP is also bracketed). The two DPs share the same morphosyntactic features, they are co-referential, and are both direct object DPs.

(6.145)	[$_{DP}$ ***Mutha-y-a***	***wuran-ki-***]	*bi-l-da*	*dalwani-ja*	***barrngka-y-*** .
	mut̪a-ki-a	wuɻan-ki-a	pi-l-ta	t̪alwai-ca	parŋka-ki-a
	much-fLOC-T	food-fLOC-T	3-pl-T	dig up-TH.T	lily-fLOC-T
	much-INS-Ø	foot-INS-Ø	3-pl-Ø	dig up-ACT	lily-INS-Ø
	'They dug up a lot of food, lily roots.' [E251.ex.6-36]				

The section is structured as follows. An overview of the functions of juxtaposition is presented in §6.8.1, leading to the first revision of the working definition in (6.144). In §6.8.2 following a consideration of the relationship of juxtaposition to NUMBER, a second revision is made. The relationship of juxtaposition to passivisation, topicalisation and focalisation is discussed in §6.8.3, and then in §6.8.4 the question is posed, whether the sharing of features across juxtaposed DPs might be due to something like a single 'juxtapositional phrase' in the non-surface syntax, to which the answer turns out to be negative. The topic of juxtaposed DPs without N heads of NP is addressed in §6.8.5, and in §6.8.6 the findings of the foregoing sections are applied to the analysis of CASE:privative as it is used to mark narrow scope negation. Finally, juxtaposition is compared in §6.8.7 with secondary predication and in §6.8.8 with the formal notions of 'referential case' and 'case linkage'.

6.8.1 Functions of DP juxtaposition

Juxtaposition is used to several functional ends in Kayardild, most of which will be introduced in this section; a small, additional set is discussed in §§6.8.5–6.8.6. As an organisational device, the examples below are grouped according to the degree of overlap in the reference of the juxtaposed DPs. Captions to the examples indicate the function of juxtaposition being illustrated and provide references, where appropriate to discussion in Evans (1995a).

In (6.146)–(6.147) the juxtaposed DPs each have separate, though coordinated, referents.

(6.146) Conjunction (Evans 1995a: 250)

Wumburu-rnurru,	***wangal-nurruw-a***	*bi-l-d.*
wumpuɻuŋ-ɳuru-a	waŋalk-ɳuru-a	pi-l-ta
spear-fASSOC-T	boomerang-fASSOC-T	3-pl-T
spear-ASSOC-Ø	boomerang-ASSOC-Ø	3-pl-Ø

'They have spears and boomerangs with them.' [W1960; E250.ex.6-34]

(6.147) Disjunction

Nguku-maru-tha	*darrbuu-ja*	***mala-maru-th.***
ŋuku-maɻu-t̪a	ʈarpuː-ca	mala-maɻu-t̪a
freshwater-fDAT-TH.T	drag-TH.T	sea-fDAT-TH.T
freshwater-DAT-ACT	drag-ACT	sea-DAT-ACT

'(People) drag (boats) into freshwater or into the sea.' [R2005-jul19b]

In (6.148)–(6.153) there is a partial or full overlap in the reference of the two DPs, by virtue of one being a sub-part of, or the constituent substance of, the other. As in all cases in Kayardild juxtaposition, there is no absolute constraint on the order of juxtaposed DPs, even when the semantic relationship between them is asymmetrical (as in 'A is a part of B').[65]

[65] This does not rule out the possibility that tendencies towards some word orders and away from others could exist. The issue of surface word order is touched upon in §6.9.3.

(6.148) Part–whole: literal part–whole (Evans 1995a: 248)

Dathina	*kuna~wun,*	*wanjii-j-i-ri*	***dabarr-i-r***
ṯaṯina	kuna-kuna-ø	waɲci:-c-ki-ɻi	ṯapar-ki-ɻi
that.T	‹child$_{\text{NL}}$-child$_{\text{NL}}$›-T	ascend-TH-fLOC-fALL.T	tree-fLOC-fALL.T
that	‹child›-Ø	ascend-Ø-Ø-DIR	tree-Ø-DIR

[$_{\text{DP}}$ ***kunya--ri***	***wanka--r***]
kuɲa-ki-ɻi	wanka-ki-ɻi
small-fLOC-fALL.T	branch-fLOC-fALL.T
small-Ø-DIR	branch-Ø-DIR

‘That child is climbing a small branch of the tree’ [W1960]

(6.149) Part-whole: ‘inclusory construction’[66] (Evans 1995a: 249)

Kaja~kaja-	***nga-rr-a***	*wuu-j-u-.*
kaca-kaca-ø	ŋa-r-ta	wu:-c-kuu-ø
‹father$_{\text{NL}}$-father$_{\text{NL}}$›-T	1-du-T	give-TH-fPROP-T
‹father›-Ø	1-du-Ø	give-Ø-POT-Ø

‘Your father and I will give you (in marriage).’ [R2005-jul08]
Lit. ‘(Including) father, we two will give you.’

(6.150) Part-whole: type of individual within a group, bundle, etc. (Evans 1995a: 249)

Nga-da	*kurri-ja*	***kawuka-y-a***	***jardiyali-y-a***
ŋaṯ-ta	kuri-ca	kawuka-ki-a	caṯiali-ki-a
1sg-T	see-TH.T	bundle-fLOC-T	fighting stick-fLOC-T
1sg -Ø	see-ACT	bundle-INS-Ø	fighting stick-INS-Ø

‘I saw a bundle of fighting sticks’ [E248.fn.6]

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[66] The ‘inclusory construction’ in which a subset-denoting DP in apposed to a superset-denoting pronoun is common in Australian languages (Singer 2001).

(6.151) Part–whole: component substance[67] (Evans 1995a: 249)

Ki-l-da	***malba-a***	*burldi-ja*	***birrk-** !*
ki-l-ta	malpa-a	puɻʈi-ca	pirk-a
2-pl-T	grass-T	roll-TH.T	string-T
2-pl-Ø	grass-Ø	roll-IMP	string-Ø

'You all roll some grass string!' [W1960]

Examples (6.152)–(6.153) illustrate extensions of the part–whole use of juxtaposition, to 'parts' which are emissions from, or produced by, the whole.

(6.152) Part–whole: eggs, excretions (Evans 1995a: 248)

[$_{DP}$ ***Kurraji~wurraji-,***	***kuru-***],	***banga-a.***
kuraci-kuraci-a	kuɻu-a	paŋa-a
‹few$_{NL}$-few$_{NL}$›-T	egg-T	turtle-T
‹few›-Ø	egg-Ø	turtle-Ø

'There are few turtle eggs.' [W1960]

(6.153) Part–whole: tracks, produced sound, words, voice quality, language, spirit (Evans 1995a: 248)

Nga-da	*kurri-ja*	***banga-y-a***	***bartha-y-a***
ŋa̪t-ta	kuri-ca	paŋa-ki-a	paɻʈa-ki-a
1sg-T	see-TH.T	turtle-fLOC-T	track-fLOC-T
1sg-Ø	see-ACT	turtle-INS-Ø	track-INS-Ø

'I saw a turtle track' [E248.fn.6]

[67] I have only been able to locate actual juxtapositions of *malbaa birrka* in combination with the verb *burldi-j-* 'make by rolling', so example (6.153) might be better translated as 'You all roll some grass into string', in which case the juxtaposition is one of raw material and product. To exemplify the 'component substance' type, Evans (1995a: 249) also cites *kamarra dangkaa* (lit. 'stone man') referring to the mythological 'stone man' figure *Kajurku*.

In (6.154)–(6.156) the referents of the two DPs are now identical, though the referent is described differently in each DP.

(6.154) Elaboration (one DP contains all constituents of another DP, plus more)

Kurda-y-a	*wirdi-ja*	[$_{DP}$ ***mudin-kiy-a***	***jungarrba-y-a***
kuʈa-ki-a	wiʈi-ca	mutin-ki-a	cuŋarpa-ki-a
coolamon-fLOC-T	stay-TH.T	tied together-fLOC-T	big-fLOC-T
coolamon-INS-Ø	stay-ACT	tied together-INS-Ø	big-INS-Ø

bardangu-y-a	***kurda-y***-].
paʈaŋu-ki-a	kuʈa-ki-a
large-fLOC-T	coolamon-fLOC-T
large-INS-Ø	coolamon-INS-Ø

‘(They) stay in the coolamon, in the great big, bound coolamon.’
[R2005-aug02a]

(6.155) Alternative characterisation (different N head of NP occurs in each DP)
(Evans 1995a: 250–51)

Warra-a	***dathin-nguni-y-a***	*diya-ja*	***Murarri-nguni***-- .
wara-a	ʈat̪in-ŋuni-ki-a	ʈia-ca	muɻari-ŋuni-ki-a
far-T	there-fINST-fLOC-T	eat-TH.T	(place)-fINST-fLOC-T
far-Ø	there-INST-INS-Ø	eat-ACT	(place)-INST-INS-Ø

‘(They) ate far away, there, at Murarri.’ [E1987-09-01]

(6.156) Generic–specific reference (Evans 1995a: 244–47)

Dathina	*jardi-wuthin-da*	*badi-ja*	***jul-i-***	***wuran-ki-.***
ʈat̪ina	caʈi-wut̪iɲ-ta	pati-ca	cul-ki-a	wuɻan-ki-a
that.T	group-PLENTY-T	carry-TH.T	bone-fLOC-T	food-fLOC-T
that	group-PLENTY-Ø	carry-ACT	bone-INS-Ø	food-INS-Ø

‘All those (ants) are carrying a bone.’ [E244.ex.6-20]

Example (6.157) illustrates one from a small set of what could be termed ‘juxtapositional idioms’. Other examples are *natha- bartha-* ‘base camp (lit. camp track)’ and *riin- bathin-*

‘from every direction (lit. from the east, from the west)’. Departing somewhat from the general pattern of juxtaposition, the word order in these idioms is fixed, and the two DPs are always adjacent.

(6.157) ‘Juxtapositional idiom’ (Evans 1995a: 297)

Nga-da	*kurri--nang-ku-*	***kirrk-u-***	***mibur-u-***
ŋaṯ-ta	kuri-c-naŋ-kuu-ø	kirk-kuu-ø	mipuɻ-kuu-ø
1sg-T	see-TH-fNEG-fPROP-T	‹nose-fPROP-T	eye-fPROP-T›
1sg-Ø	see-Ø-NEG-POT-Ø	‹face-FUT-Ø	›

bi-rr-wan-ju- .
pi-r-paɲ-kuu-ø
3-du-fPOSS-fPROP-T
3-du-POSS-FUT-Ø
‘I can’t see their faces.’ [W1960]

At this point, let us update the working definition of juxtaposition to reflect the fact, as we have seen, that juxtaposed DPs are either co-referential (partially or fully)[68] or co-ordinated, and that they share the same semantic/grammatical role. A revised definition will be shown below, after the status of NUMBER has been considered.

6.8.2 Juxtaposition and NUMBER

Juxtaposed DPs do not necessarily agree in NUMBER. Examples are shown in (6.158) and (6.159).

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[68] Co-reference will need to be viewed in a culturally appropriate manner, in which for example a turtle and its egg are related as whole and part. (Given that reference is a matter of discourse pragmatics, a degree of cultural specificity is to be expected.)

(6.158)	[$_{DP}$ ***Kiyarrng-ka***	***yakuri-***]$_{NUM:Ø}$,	***kunya-yarrng-ka*** $_{NUM:DU}$	*wirdi-j.*
	kiarŋ-ka	jakuɻi-a	kuɲa-kiarŋ-ka	wiʈi-ca
	two-T	fish-T	small-fDU-T	stay-TH.T
	two-Ø	fish-Ø	small-DU-Ø	stay-ACT

‘There are two small fish (in there).’ [W1960]

(6.159)	*Kurri-ja*	***dangka-wala-da***$_{NUM:PL}$	[$_{DP}$ ***wirrka--n-da***	***dangka-a***]$_{NUM:Ø}$
	kuri-ca	ʈaŋka-palat̪-ta	wirka-c-n-ta	ʈaŋka-a
	see-TH.T	person-fPL-T	dance-TH-fN-T	person- T
	see-IMP	person-PL-Ø	dance-Ø-PROG-Ø	person -Ø

maku-wala-da$_{NUM:PL}$ *!*
maku-palat̪-ta
woman-fPL-T
woman-PL-Ø
‘Look the people, the dancing people, the women!’ [W1960]

Incorporating the update at the end of §6.8.1, a revised definition of juxtaposition can be formulated as in (6.160):

(6.160) Juxtaposition (revised definition)

> The co-occurrence within the clause of multiple DPs which (i) share the same inflectional features other than NUMBER, (ii) are co-referential (partially or fully) or co-ordinated, and (iii) share the same semantic/grammatical role.

6.8.3 Juxtaposition and grammatical role alternations

In §§6.8.1–6.8.2 we have seen juxtaposed DPs exhibiting identical inflection and sharing the same semantic/grammatical roles. When juxtaposed DPs undergo alternations in their grammatical role — when they are topicalised, focalised or promoted to subject in a passive clause — they also act in tandem.

Example (6.229) on p.629 below illustrates the focalisation of three juxtaposed DPs [*wankuya*] [*dathinkiya*] [*riinkiya*] ‘a shark there coming from the east’. Example (6.161) illustrates the (VP-internal) topicalisation of three juxtaposed DPs,[69] and (6.162) shows three juxtaposed DPs all promoted to subject in a passive clause.

(6.161)	*Kuliya--n !*	[$_{\text{DP}}$ ***Mutha-a***	***malba-a***]	*ki-l-da*	*burldi-j-i-,*
	kulia-t̪-na	mut̪a-a	malpa-a	ki-l-ta	puɻʈi-c-ki-ø
	do plenty-TH-fNEG.T	much-T	grass-T	2-pl-T	roll-TH-fLOC-T
	do plenty-Ø-NEG.IMP	much-Ø	grass-Ø	2-pl-Ø	roll-Ø-IMMED-Ø

	[$_{\text{DP}}$ ***yakuri-marra****-*]	[$_{\text{DP}}$ ***nga-ku-lu-wan-marr****-*].
	jakuɻi-mara-ø	ŋa-ku-lu-paɲ-mara-ø
	fish-fUTIL-T	1-2-pl-fPOSS-fUTIL-T
	fish-UTIL-Ø	1-2-pl-Ø-UTIL-Ø

‘Don’t make too much! You’re rolling plenty of grass for us for (catching) fish.’ [W1960]

[69] A TH-TAM:immediate clause such as that in (6.161) is always associated with A-TAM:instantiated, which all three DPs would inflect for if they were not topicalised. The DPs *yakurimarra* ‘for fish’ and *ngakuluwanmarr* ‘for us’ each have the relatively common structure for juxtaposed DPs, of a CASE-inflected DP (in this instance CASE:utilitive) embedded in another DP (in this instance, a topic DP), on which see further §6.8.5 below.

(6.162)	***Mirnkin-da***	*kabaa--j,*	[DP ***jungarra***-	***mirnkin-d***],
	miɳkin-ta	kapa-i-t̪a	cuŋara-ø	miɳkin-ta
	yam-T	find-fMID-TH.T	big-T	yam-T
	yam-T	find-MID-ACT	big-Ø	yam-T

[DP ***jungarra***-	***kandu~kandu***-].
cuŋara-ø	kantu-kantu-a
big-T	‹blood-blood›-T
big-Ø	‹light coloured›-ø

‘A yam gets found, a big yam, a big, light-coloured one.’ [E1982-01-01]

6.8.4 Juxtaposed DPs do not constitute a domain of concord

When we are faced with sets of DPs that share a similar function and identical morphosyntactic features, a key analytical question to be answered is whether (i) there is some top-down principle which ensures that similarly functioning DPs are inflected identically, or (ii) the identity in the inflections is merely an epiphenomenal reflection of the fact that each DP has acquired identical features, independently of the others, by virtue of its function. Within the framework developed in the chapter, the former view would be interpreted by introducing something like a ‘juxtapositional phrase’ (JP) in the non-surface syntax, which would dominate all DPs with similar function; features would attach directly to the JP and from there would percolate down to the DPs below, thereby ensuring that they were inflected similarly. The latter view would reject the existence of such a JP.

The question can be settled on empirical grounds relatively quickly. Although we have established that juxtaposed DPs share features and functions as stated above in (6.160), it is not the case that DPs will *always* share their morphosyntactic features just because they are co-referential/co-ordinated and share the same semantic/grammatical role — that is, reference and function should be viewed as meeting necessary but not satisfactory criteria for 'juxtaposition' as it is defined here. There are two reasons for this. As mentioned in §6.5.4.2 there exist certain lexical classes of nominals which, if they occupy the head N position in NP, will override the DP's semantic/grammatical role (i) as the determinant of the DP's mother VP node, thereby affecting what A-TAM values it can inherit, and (ii) as the determinant of DP's CASE. Also, some semantic/grammatical DP types exhibit variability in which syntactic mother node they take, again affecting the A-TAM features they end up inheriting. Now, if it were true that juxtaposed DPs had uniform features forced upon them by a top-down process, then these idiosyncrasies are precisely what we would expect to be overridden by the force of juxtaposition. But this is not what happens.

In (6.163), the DPs *danda* and *nathay* are co-referential and share the same semantic/grammatical role, yet their A-TAM values differ. The reason is that both *danda* and *nathay* are location DPs, which can take either VP_{α} or VP_{β} as their mother node (§6.5.4.2), and in (6.163) *danda* is daughter of VP_{β} while *nathay* is daughter of VP_{α}. Since the A-TAM feature in (6.163) is A-TAM:instantiated, which attaches to VP_{α}, *nathay* inherits A-TAM, but *danda* does not.[70] No top-down principle has forced the two DPs to acquire the same A-TAM feature.

[70] To be clear, the lack of inflection on *danda* in (6.163) is grounded in syntax, not in any idiosyncratic inability of the root /ʈan/ 'here' to inflect, either for the morphosyntactic feature A-TAM:instantiated or with the suffix fLOC, as seen in (a):

(6.163)	*Nga-da*	*wirdi-ja*	***dan-da***,	***natha-y-***.
	ŋat̪-ta	wiʈi-ca	ʈan-ta	ŋat̪a-ki-a
	1sg-T	stay-TH.T	here-T	camp-fLOC-T
	1sg-Ø	stay-ACT	here-Ø	camp-INS-Ø

‘I stay here in the camp.’ [E211.ex.5-45]

In (6.164) *ngumbanjina thabujuna* and *Wilikarr* are co-referential and share the same semantic/grammatical role, yet their CASE values differ. The DP *Wilikarr* is based on a proper noun stem and takes the genitive CASE to express possession (in the sense of being the composer of a song). The DP *ngumbanjina thabujuna* is based on common noun stems, and takes CASE:ablative. Again, no top-down principle has forced the two DPs to acquire the same CASE feature.

(6.164)	[***Ngum-ban-ji-na***	***thabuju--na***],	***Wili-karr***.
	ŋuŋ-paɲ-ki-naa-ø	t̪apucu-ki-naa-ø	wili-kara
	2sg-fPOSS-fLOC-fABL-T	e.Br-fLOC-fABL-T	(name)-fGEN.T
	2sg-Ø-Ø-ABL-Ø	e.Br-Ø-ABL-Ø	(name)-GEN

‘(The song is) your elder brother’s, Willy’s.’ [R2007-may22]

On account of the lack of evidence for it, no special mechanism will be posited here that forces juxtaposed DPs into acquiring identical features. When juxtaposed DPs do acquire identical features, they do so independently of one another.

(a)	*Nga-l-da*	***dan-kiy-a***	*wirdi-ja*	*yulkaan-d.*	‘We’re here permanently.’
	1-pl-T	here-fLOC-T	stay-TH.T	permanently-T	[W1960]
	1-pl-Ø	here-INS-Ø	stay-ACT	permanently-Ø	

6.8.5 Juxtaposition and DPs that lack N heads of NP

In §6.8.4 it was established that there is no need to posit any special principle or syntactic node in order to account for the identical inflection of juxtaposed DPs. This section extends that line of reasoning to several additional phenomena which also look at first glance like they should be analysed in terms of some kind of top-down concord.[71] Once the analysis has been worked through though, the patterns can be shown to fall out from principles and non-surface syntactic structures which have already been established.

6.8.5.1 A review of the syntax of DPs without N heads

As was established in §6.6.2, DPs in Kayardild do not need to contain a filled, head N position in NP. DPs without N heads are fully interpretable by the grammatical system: they have reference and a semantic/grammatical role, and in light of the latter, they are assigned a predictable position in the non-surface syntactic tree (cf §6.5.4.2), which will determine the A-TAM features they inherit.

6.8.5.2 Functions of juxtaposed DPs that lack N heads

Let us now take an overview of the functions of juxtaposed DPs which lack N heads. The examples in this section follow the same format as those in §6.8.1 above. In (6.165)–

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[71] Recall that concord involves, in addition to identical inflection, a common, dominating node from which the relevant features all percolate, cf §6.3.

(6.166) a DP which lacks a N head of NP, modifies another, juxtaposed DP in which the N head is overt. As was the case in §6.8.1, the two DPs can appear in either order.

(6.165) Modification

Nga-da	***jungarra-wu-***	*karna-j-u-*	***kaburrba-wu-***.
ŋa̪t̪-ta	cuŋarpa-kuu-ø	kaɳa-c-kuu-ø	kapurpa-kuu-ø
1sg-T	big-fPROP-T	light-TH-fPROP-T	fire-fPROP-T
1sg-Ø	big-FUT-Ø	light-Ø-POT-Ø	fire-FUT-Ø

'I want to light a *big* fire.' [E250.ex.6-31]

(6.166) Modification

Nga-da	***kiyarrng-ku-***	*kala-th-u-*	[DP ***wumburung-ku-***
ŋa̪t̪-ta	kiarŋ-kuu-ø	kala-t̪-kuu-ø	wumpuɻuŋ-kuu-ø
1sg-T	two-fPROP-T	cut-TH-fPROP-T	boomerang-fPROP-T
1sg-Ø	two-FUT-Ø	cut-Ø-POT-Ø	boomerang-FUT-Ø

mirra-wu-] .
mira-kuu-ø
good-fPROP-T
good-FUT-Ø
'I want to cut *two* good boomerangs.' [W1960; E250.ex.6-32]

In (6.167) the DP lacking a N head determines another DP in which the N head is overt.

(6.167) Determination

Nga-da	[DP ***jungarra-wu-***	***yakuri-wu***]	*diya-j-u-*	***dathin-ku .***
ŋa̪t̪-ta	cuŋarpa-kuu-ø	jakuɻi-kuu-ø	ʈia-c-kuu-ø	ʈa̪t̪in-kuu-ø
1sg-T	big-fPROP-T	fish-fPROP-T	eat-TH-fPROP-T	that-fPROP-T
1sg-Ø	big-FUT-Ø	fish-FUT-Ø	eat-Ø-POT-Ø	that-FUT-Ø

'I want to eat *that* big fish.' [E249.ex.6-29]

In the translations of (6.165)–(6.167), an emphasis has been placed on the word corresponding to the DP without N. As Evans (1995a: 249–50) documents, these DPs contribute meanings which are either restrictive (narrowing down one of multiple possible referents), or contrastive (picking out an attribute in contrast to other possible attributes). Furthermore, in terms of surface syntax, the DP without a head N is always separated by a verb from its juxtaposed counterpart.[72] Evans analyses such cases, which I take to be two juxtaposed DPs, as 'split NPs', i.e., as single, discontinuous constituents (1995a: 249–50). There are two reasons to reject the 'split' analysis though. The first is an argument from economy: there is no evidence that any other discontinuous NP/DP constituents exist in Kayardild; there is ample evidence that juxtaposed DPs exist; there is ample evidence that juxtaposition has numerous associated semantic effects, and thus it is unnecessary to posit a 'split NP' just for this one case. The second, and perhaps more compelling argument is empirical. Namely, the same semantic effect can be found even when the material in the DP without N is repeated in the juxtaposed DP, as in (6.168) below. On these grounds we can reject the split NP analysis and recognise these constructions as juxtapositional.

[72] One wonders whether the true generalisation might be that they are separated by any constituent. Although I have searched at some length for an example in which the separating constituent is something other than a verb, I have not found any.

(6.168) Elaboration

Jungarrba-yarrng-ka	*ki-rr-a*	*kalaa--ja,*
cuŋarpa-kiarŋ-ka	ki-r-a	kala-i-t̪a
big-fDU-T	2-du-T	cut-fMID-TH.T
big-DU-Ø	2-du-Ø	cut-MID-ACT

[DP ***jungarrba-yarrng-ka***	***kuna~wuna-yarrng-k***]
cuŋarpa-kiarŋ-ka	kuna-kuna-kiarŋ-ka
big-fDU-T	‹child$_{NL}$-child$_{NL}$›-fDU-T
big-DU-Ø	‹child›-DU-Ø

'You two were cut (i.e., given cicatrices) *big*, as big children.' [R2005-jul08]

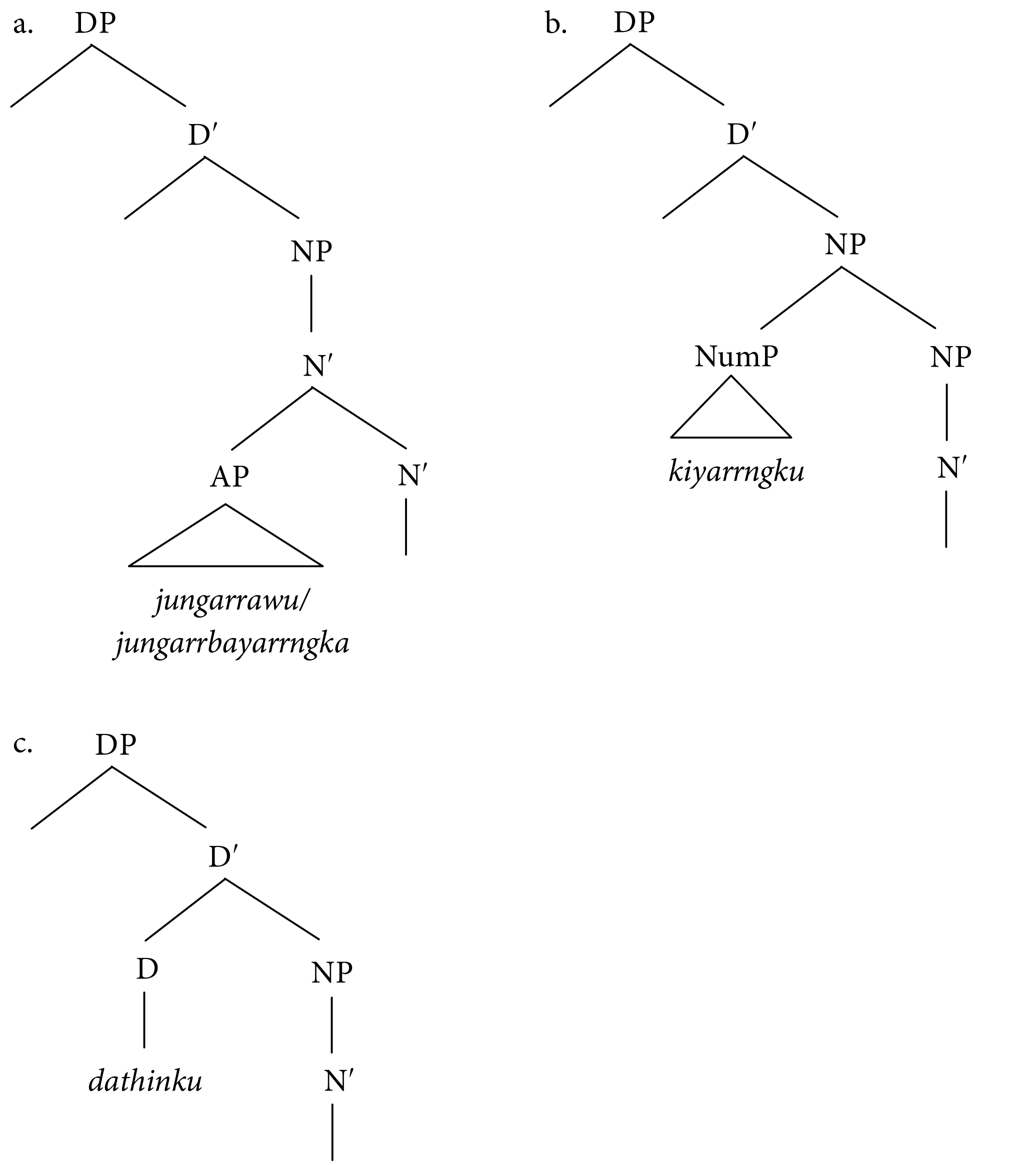
In (6.168) the DP without N contains merely a subset of the constituents found in the other DP. This elaborative juxtaposition can be compared with (6.154) above in which the smaller DP also contained a subset of the constituents found in the larger DP, but in that case, the subset included N.

6.8.5.3 The syntax of juxtaposed DPs that lack N heads of NP

Let us now consider the syntax of juxtaposed DPs that lack a N head. Beginning with the position of the DP in relation to the overall clause structure, we can observe that in all of the sentences (6.165)–(6.168) the A-TAM inflections of the juxtaposed DPs in question correspond precisely to what we expect if the DP is fit into the clause based simply on its semantic/grammatical role: the direct object DPs, as daughters of VP$_{\alpha}$, show inflection for A-TAM, while the subject DPs, as daughters of VP$_{\delta}$, do not.

Turning to the internal structure of juxtaposed DPs that lack a N head, we find the following. In (6.165) and in (6.168) the lone word in the juxtaposed DP in question is an A head. Moreover, that A head functions as a modifier, a behaviour consistent with it occupying an AP sister of N′, as shown in (6.169a) below. In (6.166), the juxtaposed DP in question contained just the Num head *kiyarrngku* ‘two’, in a syntactic configuration shown in (6.169b). In (6.167) the DP in question contained the demonstrative *dathinku*. Demonstratives can function as D heads or as N heads. *Dathinku* in the former function would translate as ‘that’, and in the latter as ‘there’. Since *dathinku* ‘that’ in (6.167) functions as a determiner, we can surmise that its syntactic structure is as shown in (6.169c).

(6.169)



The most interesting question raised by the existence of juxtaposed DPs with the structures in (6.169), is whether juxtaposed DPs lacking N are also attested containing constituents which are not represented in (6.169), that is, containing DP in [Spec DP], DP modifiers in the N′-sister position and VP modifiers in the N′-sister position. The answer is yes, and we can begin with DPs in [Spec, DP]

6.8.5.4 Juxtaposed DPs that lack N heads of NP, and contain embedded DP or VP

In (6.170), DP_{LOW} *jungarrbanabaya dangkanabaya* 'the adults'' appears inside a DP_{HIGH} in its [Spec DP] position, and determines the juxtaposed DP *wuranki* 'food' — by doing so it induces the definite interpretation 'the adults' food', as opposed to the indefinite 'food from the adults'.

(6.170) Determination by $[_{DP}$ DP $[_{D'}$]]

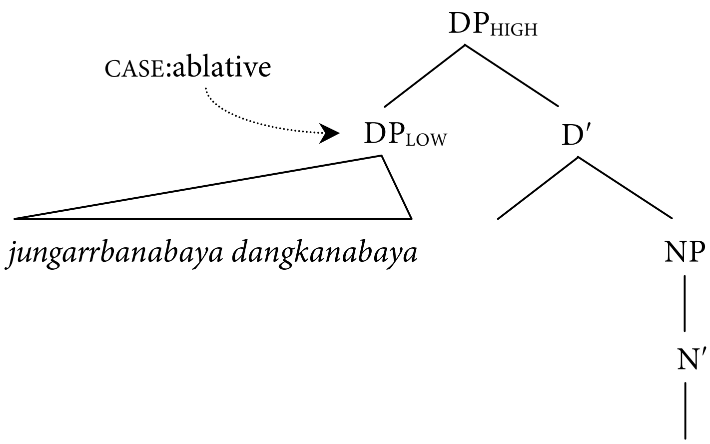
$[_{DPHIGH}[_{DPLOW}$	***Jungarrba-naba-y-a***	***dangka-naba-y-a***] $[_{D'}$]]
	cuŋarpa-ki-napa-ki-a	ʈaŋka-ki-napa-ki-a
	big-fLOC-fABL-fLOC-T	person-fLOC-fABL-fLOC-T
	big-Ø-ABL-INS-Ø	person-Ø-ABL-INS-Ø

wungi-ja	***wuran-ki-.***
wuŋi-ca	wuɻan-ki-a
steal-TH.T	food-fLOC-T
steal-ACT	food-INS-Ø

'They stole the adults' food' [E790]

The syntactic embedding of DP_{LOW} within DP_{HIGH} in (6.170) in shown in (6.171).

(6.171)



At this point, one might question whether such a complicated DP structure as (6.171) is justified, when it seems simpler just to posit one DP (the DP$_{\text{LOW}}$) without an extraneous, otherwise-empty matrix DP above it. In fact though, both semantic and inflectional considerations point towards an analysis along the lines of (6.171). It is perhaps easiest to approach this issue by considering what the contrast would be, between a DP like (6.171) and an unembedded CASE:ablative DP. Semantically, the interpretation of DP$_{\text{LOW}}$ in the former would follow both from the CASE of DP$_{\text{LOW}}$ and the position of DP$_{\text{LOW}}$ in DP$_{\text{HIGH}}$; in the latter, the semantics would follow from CASE alone. Inflectionally, DP$_{\text{LOW}}$ in the former should inherit A-TAM according to the syntactic mother node selected by DP$_{\text{HIGH}}$, on the basis of the semantic/grammatical role of DP$_{\text{HIGH}}$; in the latter the DP would inherit A-TAM according to its own syntactic mother node which it would select directly. The key sentence with which to compare (6.170) is one like (6.172). In (6.172), the DP *jungarrana dangkana* is not DP$_{\text{LOW}}$ within DP$_{\text{HIGH}}$, but is unembedded.

(6.172) (Not juxtaposition)

Nga-l-da	*marri-ja*	*kang-ki-*	[$_{\text{DPHIGH}}$	***jungarra--na-***
ŋa-l-ta	mari-ca	kaŋ-ki-a		cuŋara-ki-naa-ø
1-pl -T	hear-TH.T	story-fLOC-T		big-fLOC-fABL-T
1-pl-Ø	hear-ACT	story-INS-Ø		big-Ø-ABL-Ø

dangka--na-].
ţaŋka-ki-naa-ø
person-fLOC-fABL-T
person-Ø-ABL-Ø
'We heard the story from the old people.' [E143.ex.4-35; 605.line.35]
Alternative interpretation, in appropriate context:
'We heard the story from old people.'

In (6.172), unlike (6.170), the 'old people' need not by interpreted as definite, because *jungarrana dangkana* is not a determiner — it cannot be, because it is not embedded in another DP. Also in (6.172), and unlike (6.170), the CASE:ablative DP *jungarrana dangkana* selects its own mother node. CASE:ablative DPs, when they select their own mother node select VP_β or VP_γ (this was discussed earlier in §6.5.4.4; see also §6.5.4.2, and Appendix B, §B.6.1). This situates them higher than VP_α and hence unable to inherit A-TAM:instantiated which attaches to VP_α. In (6.172), *jungarrana dangkana* does not inflect for A-TAM:instantiated. Turning back to (6.170), we see that the interpretation of DP_{LOW} *jungarrbanabaya dangkanabaya* as a determiner depends not only its ablative CASE, but on the fact that it occupies [Spec DP] in DP_{HIGH}, and the fact that it inflects for A-TAM:instantiated follows from the fact that its superordinate DP_{HIGH} is a direct object DP, and thus low enough in the clause to inherit A-TAM:instantiated. In short, the syntactic analysis in (6.171) is amply supported by the facts. Let us move now to DP sisters of N′.

As was the case for embedded DP$_{\text{LOW}}$'s in the [Spec DP] position, a DP$_{\text{LOW}}$ sister of N′ will have its own CASE feature, and the overall position of DP$_{\text{HIGH}}$ in the non-surface syntactic tree is determined by the role of DP$_{\text{HIGH}}$ (irrespective of the CASE or role of DP$_{\text{LOW}}$). That this is the case can be seen in the comparison of (6.173) and (6.174). DP$_{\text{LOW}}$ takes CASE:origin in both cases, but in (6.173) DP$_{\text{HIGH}}$ is a subject and so escapes inflection for A-TAM (which would be A-TAM:instantiated); in (6.174) DP$_{\text{HIGH}}$ is a direct object and so it inherits and inflects for A-TAM:future.

(6.173) Modification by [$_{\text{DP}}$[$_{\text{NP}}$[$_{\text{N′}}$ DP [$_{\text{N′}}$]]]

[$_{\text{DP}}$ ***Mutha-a***	***wuran-da***]	*barji-ja*	[$_{\text{DP}}$[$_{\text{NP}}$[$_{\text{N′}}$ ***mala-waan-d***]]],
muṯa-a	wuɻan-ta	paɻci-ca	mala-wa:ɲ-ta
many-T	animal-T	fall-TH.T	sea-fORIG-T
many-Ø	animal-Ø	fall-ACT	sea-ORIG-Ø

[$_{\text{DP}}$ ***balkan-d***].
palkan-ta
fish killed by wind-T
fish killed by wind-Ø

'Many *marine* animals wash up, fish killed by the wind.' [R2007-jun02]

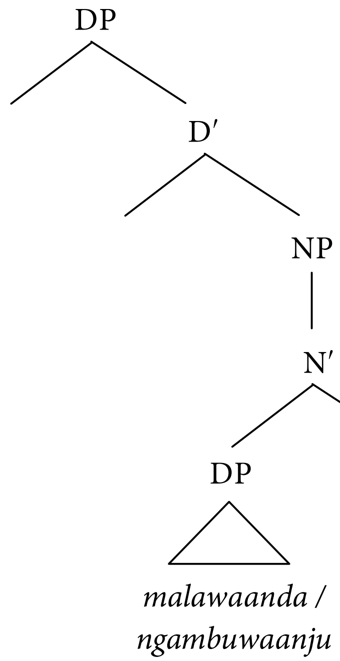
(6.174) Modification by [$_{\text{DP}}$[$_{\text{NP}}$[$_{\text{N′}}$ DP [$_{\text{N′}}$]]]

[$_{\text{DP}}$[$_{\text{NP}}$[$_{\text{N′}}$[$_{\text{DP}}$ ***Ngambu-waan-ju***]]]]]	*diya--nang-ku-*	***nguku-uru-*** .
ŋampu-wa:ɲ-kuu-ø	ṯia-c-naŋ-kuu-ø	ŋuku-kuɻu-a
well-fORIG-fPROP-T	eat-TH-fNEG-fPROP-T	water-fPROP-T
well-ORIG-FUT-Ø	eat-Ø-NEG-POT-Ø	water-FUT-Ø

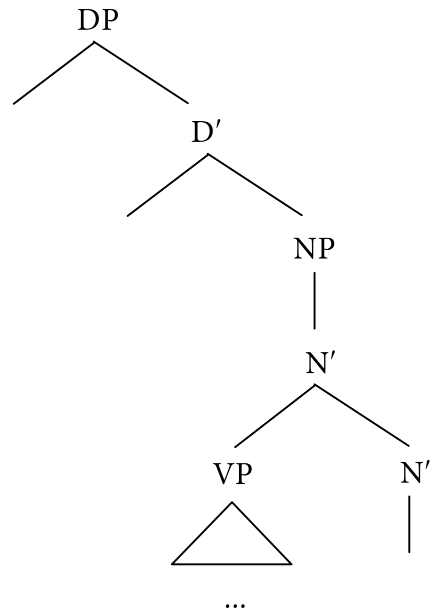
'(At that place) you can't drink water *from the well*.' [R2007-may29]

The syntactic structure of the juxtaposed DPs lacking N in (6.173) and (6.174) is shown in (6.175).

(6.175)



(6.176)



The only structure yet to be examined is that shown in (6.176), where a juxtaposed DP contains nothing but an embedded VP, however we have already encountered this structure in §6.5.4.4 above, in example (6.82) — it is a juxtaposed relative clause. In §6.5.4.4 there was no reason given for why a relative clause should be analysed as a VP, embedded within a DP that lacks a head N and is itself juxtaposed to the DP it relates to. In this section we have established the reason: juxtaposed XP modifiers have the syntactic form of an XP sister of N′, embedded in a DP that lacks a head N and is juxtaposed to the DP to which it relates. By analysing relative clauses in the same way we predict the inflectional behaviour that was exemplified in §6.5.4.4 with respect to A-TAM features: the VP_{LOW} inherits features which percolate from the mother node of DP_{HIGH}, which is selected according to the role of DP_{HIGH}. Furthermore, if DP_{HIGH} has its own CASE feature, then that too will percolate down onto every word in VP_{LOW}. In (6.177), five consecutive, juxtaposed DPs are inflected for CASE:proprietive. The final DP contains only a relative clause. All words in that relative clause VP inherit and inflect for CASE:proprietive.

(6.177) Percolation of CASE:proprietive onto all words of embedded, relative clause VP which is juxtaposed to other CASE:proprietive DPs

(*Darirr-a*	*mardalaa--ja*)	[DP *mutha-wu-*	*ngunymurr-u-*],
ʈaɻir-a	maʈala-i-ca	mut̪a-kuu-ø	ŋuɲmur-kuu-ø
infant-T	rub-MID-TH.T	much-fPROP-T	grease-fPROP-T
infant-Ø	rub-MID-ACT	much-PROP-Ø	grease-PROP-Ø

[DP *mutha-wu-*	*ngunymurr-u-*	*wuran-ku*],
mut̪a-kuu-ø	ŋuɲmur-kuu-ø	wuɻan-kuu-ø
much-fPROP-T	grease-fPROP-T	food-fPROP-T
much-PROP-Ø	grease-PROP-Ø	food-PROP-Ø

[DP *mak-u--n-maan-ju-*	*wuran-ku-*],
mak-wu-c-n-waːɲ-kuu-ø	wuɻan-kuu-ø
torch-fDON-TH-N-fORIG-fPROP-T	food-fPROP-T
torch-DON-Ø-N-ORIG-PROP-Ø	food-PROP-Ø

[DP *ngimi-waan-ju-*	*wuran-ku-*],	[DP[NP[N′[VP ***kurdala-th-irrin-ju-***
ŋimi-waːɲ-kuu-ø	wuɻan-kuu-ø	kuʈala-t̪-iriɲ-kuu-ø
night-fORIG-fPROP-T	food-fPROP-T	spear-TH-fRES-fPROP-Ø
night-ORIG-PROP-Ø	food-PROP-Ø	spear-Ø-RES-PROP-Ø

ngimi-waan-ji-naba-wu-	***kanthathu--naba-wu-***]]]]].
ŋimi-waːɲ-ki-napa-kuu-ø	kan̪t̪at̪u-ki-napa-kuu-ø
night-fORIG-fLOC-fABL-fPROP-T	father-fLOC-fABL-fPROP-T
night-ORIG-Ø-ABL-PROP-Ø	father-Ø-ABL-PROP-Ø

‘(The newborn was rubbed) with lots of grease, lots of greasy food, with food (speared) by (the light of) a bark torch, with food (speared) at night-time, speared by (the baby’s) father at night-time.’ [E116.ex.3-52]

In §6.8.7 below, similarities and differences will be discussed between juxtaposed DPs which lack N heads and depictive second predicates. First though, let us examine the role of juxtaposition in narrow scope negation.

6.8.6 Juxtaposition in the analysis of narrow scope negation

The formal privative suffix fPRIV is used to mark narrow-scope negation, and in doing so it appears not to exhibit complete concord in DP. Although cases certainly exist where fPRIV occurs on all words in the DP, as in (6.178) and (6.180) below, it is also possible to find fPRIV on just a determiner (6.179), just a number (6.181), just a modifier (6.182) or on just the head N (6.183).

(6.178) fPRIV across whole DP

Dathina	*dangka-a,*	[DP ***ngij-in-marriy-a***	***wakatha-warriy-a***]
ʈa̪ʈina	ʈaŋka-a	ŋicu-iɲ-wari-a	waka̪ʈa-wari-a
that.T	person-T	1sg-fPOSS-fPRIV-T	sister-fPRIV-T
that	person-Ø	1sg-POSS-PRIV-Ø	sister-PRIV-Ø

kirrk-a	*miburl-d.*
kirk-ka	mipuɻ-ta
‹nose-T	eye-T›
‹face-Ø	›

‘That person does not look like my sister (lit. does not have my sister’s face).’
[W1960]

(6.179) fPRIV on possessive pronoun only

Dan-da	[$_{\text{DP?}}$ ***ngij-in-marriy-a***	*wangalk-*],	*ni-wan-da*	*wangalk-*.
ʈan-ta	ŋicu-iɲ-wari-a	waŋalk-ka	ŋi-paɲ-ta	waŋalk-ka
this-T	1sg-fPOSS-fPRIV-T	boomerang-T	3sg-fPOSS-T	boomerang-T
this-Ø	1sg-POSS-PRIV-Ø	boomerang-Ø	3sg-POSS-Ø	boomerang -Ø

'This isn't my boomerang, it's his boomerang' [W1960]

(6.180) fPRIV across whole DP

[$_{\text{DP}}$ ***Mutha-warriy-a***	***thawal-warri***.]
muʈ̪a-wari-a	ʈ̪awal-wari-a
much-fPRIV-T	yam-fPRIV-T
much-PRIV-Ø	yam-PRIV-Ø

'There's not many yams.' [E1982-01-01]

(6.181) fPRIV on Num only

[$_{\text{DP?}}$ ***Mutha-warri-***	*wuran-d !*]
muʈ̪a-wari-a	wuɻan-ta
much-fPRIV-T	food-T
much-PRIV-Ø	food-Ø

'There's not much food!' [R2006-aug10]

(6.182) fPRIV on AP only

Jungarra-	*wambal-d.*	*Dathina*	[$_{\text{DP?}}$ ***kunya-warriy-a***	*wambal-d*].
cuŋara-ø	wampal-ta	ʈ̪at̪ina	kuɲa-wari-a	wampal-ta
big-T	bushfire-T	that.T	small-fPRIV-T	bushfire-T
big-Ø	bushfire-Ø	that	small-PRIV-Ø	bushfire-Ø

'It's a big bushfire. That's not a small bushfire.' [E1984-08-04]

(6.183) fPRIV on N only

Ngarrawurna-	*nila-tha*	*ngum-ban-ji-,*
ŋarauɳa-ø	ɳila-t̪a	ŋuŋ-paɲ-ki-a
(name)-T	call by name-TH.T	2sg-fPOSS-fLOC-T
(name)-Ø	call by name-ACT	2sg-Ø-INS-Ø

maraka	[$_{DP?}$ *ngum-ban-da*	***kuna-wuna-warri***-].
maɻaka	ŋuŋ-paɲ-ta	kuna-kuna-wari-a
CTRFCT	2sg-fPOSS-T	‹child$_{NL}$-child$_{NL}$›-fPRIV-T
CTRFCT	2sg-POSS-Ø	‹child$_{NL}$›-PRIV-Ø

‘Ngarrawurna is calling you by name, as if he weren’t your son (i.e., he is behaving as if he were in some other kin relation to you).’ [E373.ex.9-235]

The interpretation of these facts in Evans (1995a) is that ‘the privative need not display full phrasal concord when functioning as a negator; instead, the domain of case marking depends on the logical scope of negation.’ (1995a: 159). While I agree that the domain of CASE marking does depend on logical scope, it need not follow that the normal principles of CASE concord are suspended. Rather than posit a non-concordial domain of CASE:privative inflection, it is possible to assume that a special mapping holds between logical scope and the syntax, such that the words under the scope of negation are placed in their own DP, to which CASE:privative attaches, and which is then juxtaposed with another one or more DPs containing the out-of-scope words, which are not inflected for CASE:privative. That is the analysis adopted here.

6.8.7 Parallels and differences between juxtaposition and second predicates

In terms of both their inflection and their apparent internal syntax, depictive second predicates closely resemble juxtaposed DPs that lack N heads. The simple nominal second predicates in (6.184) and (6.185) could be analysed as having an internal syntax parallel to that shown in (6.169a) above — that is, they could be A heads in AP sisters of N′ in otherwise-empty DPs.

(6.184) Depictive second predicate on the subject (CASE:Ø nominal)
Nga-da *kada* ***ngumal-da*** *yiwii-j-u- .*
ŋat̪-ta kata ŋumal-ta jiwi:-c-kuu-ø
1sg-T again.T single-T sleep-TH-fPROP-T
1sg-Ø again single-Ø sleep-Ø-POT-Ø
'I'll be sleeping by myself (as a single man) again.' [E359.ex.9-170]

(6.185) Depictive second predicate on the direct object (CASE:Ø nominal)
Burung-ku- *diya-j-u-,* ***burung-ku-*** *diya-j-u- .*
puɻuŋ-kuu-ø t̪ia-c-kuu-ø puɻuŋ-kuu-ø t̪ia-c-kuu-ø
cooked-fPROP-T eat-TH-fPROP-T cooked-fPROP-T eat-TH-fPROP-T
cooked-FUT-Ø eat-Ø-POT-Ø cooked-FUT-Ø eat-Ø-POT-Ø
'We'll eat it cooked, we'll eat it cooked.' [R2007-may23b]

The CASE:origin second predicate on the direct object in (6.186) could be analysed as having an internal syntax parallel to that shown in (6.175) above (i.e., a DP sister of N′), and the clausal second predicate on the subject in (6.74) on p.520 above could be analysed as having the internal syntax shown in (6.176) above (i.e., a VP sister of N′).

(6.186) Depictive secondary predicate on the direct object (CASE:origin DP)
Kaburrba-waan-ju *diya-j-u-* *wuran-ku.*
kapurpa-wa:ɲ-kuu-ø t̪ia-c-kuu-ø wuɻan-kuu-ø
coals-fORIG-fPROP-T eat-TH-fPROP-T food-fPROP-T
coals-ORIG-FUT-Ø eat-Ø-POT-Ø food-FUT-Ø
(In response to the question of whether to eat the food raw or cooked):
'We'll eat the food from the coals.' [R2005-jul15a]

Turning to inflection, it appears at first glance as if depictive second predicates could be treated not merely *like* juxtaposed DPs but *as* juxtaposed DPs (at some level of representation): second predicates on the subject, like subject DPs, never inflect for A-TAM, and second predicates on the direct object, like direct object DPs, always inflect for A-TAM. There are differences however, which can be listed as follows.

Subjects and direct objects, including those consisting of multiple juxtaposed DPs, can be focalised (§6.5.1.3), and direct objects can be topicalised (§6.5.1.2), but I have no examples of focalised or topicalised second predicates, suggesting that focalisation and topicalisation of second predicates is not possible.

As mentioned in §6.5.2.2 subjects cannot appear in embedded VPs but second predicates on subjects can.[73]

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[73] Evidence from VP embedding indicates that body parts may sometimes be treated syntactically as second predicates. Evans (1995a:362–63) argues on semantic grounds that body parts which are the 'locus of effect' in a clause are second predicates. This is supported by the syntactic evidence found in sentences such as (a). In (a) the word *bardakantha* 'belly' is a subject second predicate in the embedded clause 'to put (food) in my belly'; it is not juxtaposed to *ngijuwa* 'I' in the matrix clause — if *bardakantha* were juxtaposed the sentence would be the nonsensical 'My belly will go to put (food) in itself.':

(a)	*Warra-j-uu-ntha-*	*ngiju-wa-*	[VP ***bardaka-ntha-***
	wara-c-kuː-n̪t̪a-ø	ŋicu-pa-ø	paʈaka-n̪t̪a-ø
	go-TH-fPROP-fOBL-T	1sg-fCOMP-T	belly-fOBL-T
	go-Ø-POT-COMP-Ø	1sg-COMP-Ø	belly-COMP-Ø

In §6.9.3.1 below the particle *maarra*$_2$ 'SUBJECT all/only do/be PREDICATE' is shown to align to the right of subject DPs, including juxtaposed subject DPs, but it aligns to the left of depictive second predicates, as illustrated in (6.187).

(6.187)	*Bi-l-da*	*maarra-*	***ngankirra-***	*warra-j.*
	pi-l-ta	maːra-ø	ŋankira-ø	wara-ca
	3-pl-T	all-T	as a group-T	go-TH.T
	3-pl-Ø	all-Ø	as a group -Ø	go-ACT
	'They (the fish) all swim in a group.' [R2005-jul29b]			

For these reasons, depictive second predicates are not analysed as juxtaposed DPs, but rather as Pred constituents (cf §6.4.9) that are daughters of VP_δ in the case of predicates on the subject and VP_α in the case of predicates on the direct object. Because subject second predicates are daughters of VP_δ, they can appear in subordinate VPs while subject DPs, which are daughters of S_α, cannot (cf §6.5.2.2). Because direct object second predicates are daughter of VP_α, they cannot be topicalised, unlike DP complements of V (including direct objects) which can (cf §6.5.5.1).

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wu-yii-j-i-ring-kuu-nth-]
wuː-i-c-ki-ɻiŋ-kuː-n̪t̪a-ø
put-fMID-TH-fLOC-fALL-fPROP-fOBL-T
put-MID-Ø-Ø-DIR-FUT-COMP-Ø
'I will go to eat', lit. 'to put (food) in my belly.' [R2005-jul21]

6.8.8 Against 'referential case' and 'case linkage' is Kayardild

Up to this point §6.8 has presented arguments in favour of an analysis of the inflection of juxtaposed DPs in which the DPs involved acquire their morphosyntactic features independently of one another. They are able to do so because each is fully specified for its semantic/grammatical role and hence can be incorporated appropriately into the non-surface syntax and from there receive features in the normal fashion. In §6.8.8 it was shown that depictive second predicates, although they inflect identically to juxtaposed DPs, are not syntactically equivalent to them. This section addresses the notions of **referential case** (Dench & Evans 1988) and **case linkage** (Evans 1995a), according to which one DP would acquire features normally, by virtue of its syntactic or semantic status, upon which its features would then be copied to another DP by virtue of a semantic relationship holding between the two.

In a seminal paper on case stacking in Australian languages, Dench and Evans (1988), following Austin (1981), identify a **referential** function of case marking which follows the formula outlined just above, where the crucial semantic relationships between the two DPs include among others part–whole relationships and entity–second predicate relationships. In the description of Kayardild, Evans (1995a: 331) alludes to the existence of *case linkage* between entity-denoting DPs and their second predicates. Although the meaning of term is not explained, it would appear that the intention is that *case linkage* is like referential case: '[I] assume that object complements are distinct constituents, and that their agreement with the object is accounted for by case linkage.' (1995a: 331).

The most acute difference between referential case and the model of feature assignment adopted here is the directness with which semantic relationships that hold between constituents lead to similarities in their inflection. In the referential case model, a semantic relationship directly ensures that the features acquired by one constituent in a 'normal' fashion are imposed on another constituent 'referentially'. Under the analysis of Kayardild proposed here, semantic relationships only affect inflection indirectly, by ensuring that constituents receive syntactic representations which then lead them, each individually, to acquire the same features. I have argued above that the current proposal is simpler, in that all constituents acquire their morphosyntactic features 'normally'. Two recent studies can also be mentioned in which a mechanism along the lines of referential case is found to be either unnecessary or unworkable.

Sadler and Nordlinger (2006a), working within the framework of Lexical Functional Grammar (Kaplan & Bresnan 1982) argue that the appositional, part–whole and asyndetic co-ordinating functions of juxtaposition in Australian languages should all be analysed in terms of just one syntactic structure, with the distinctions between the types inhering in their semantic representations. As in the present analysis of Kayardild, the a crucial component is a mapping from various semantic relationships to similar syntactic representations, which can then flow though to similarities in inflection. Under a referential case model this would not be so: a distinction would be made, for example, between part–whole juxtapositions in which 'referential case' is assigned to one of the DPs, versus conjoining juxtaposition in which both DPs would be assigned case 'normally'.

In a typological survey of depictive second predication, Schulze-Berndt and Himmelmann (2004) argue explicitly that in languages where second predicates are inflected identically to their 'controlling' DP, the identical inflection cannot be due to a superficial copying of features (as occurs in the assignment of referential case), rather the inflection of the second predicate needs to proceed from the underlying semantics independently of the inflection of the controlling DP. One reason is that second predicates inflect without difficulty, even when the semantic entity which they predicate of is not overtly expressed as a DP, in which case there is no source from which referential case could copy morphosyntactic features. An example of this appears in (6.185) above, where the second predicate on the direct object inflects as expected even though the object itself is not overtly present.

The common thread in this research and in the analysis proposed here for Kayardild is that the preconditions for similar inflection are met at the semantic level and in the mapping from semantics to syntax. After that, each constituent acquires inflectional features independently of other constituents; the resulting similarity in inflection is not due to the copying of features from one constituent to another, nor is it due to top-down pressures from semantics.

6.9 Particles, particle-like DPs, and surface syntax

On the analysis proposed here, one of the syntactic subclasses of the nominal superclass, is the subclass of **particles**. Particles do not appear in non-surface syntactic structure, rather they are introduced directly into the surface syntax as **special clitics** (Anderson 2005; Zwicky 1977), that is, they are words which appear at the edges of certain surface-syntactic domains.[74] Because particles are absent from non-surface syntactic structure they are not assigned morphosyntactic features and they do not inflect. The aim of §6.9 is to demonstrate firstly that such a model of particle syntax is plausible, and since it is a proposal based on new observations of Kayardild syntactic structure, to provide some basic exemplification.[75] In addition, it will be of interest to consider how the syntax of particles can be understood within the grammar of Kayardild surface syntax in general. The basic analysis of particle syntax is set out in §§6.9.1–6.9.2. The relationship between particle syntax and surface syntax in general is considered more closely in §6.9.3, and §6.9.4 examines constituents which resemble particles in their semantics, and are analysed by Evans (1995a) as particles, but which under the current analysis are DPs.

6.9.1 The surface syntax of particles

The syntax of particles will be analysed here in terms of a grammar of ranked, violable constraints, following Anderson (2005). Although the precise formulation of constraints will vary slightly from that used by Anderson, the basic approach is the same.

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[74] While particles are special clitics, they are not **phonological clitics**. That is, particles in Kayardild constitute independent words both phonologically and grammatically; despite their special syntax they are not 'integrated' in any way into neighbouring words. Kayardild does possess other elements which are phonological clitics, on which see Ch.3, §3.11; Ch.5, §5.3.8.4.

[75] Further exemplification of the particles discussed below can be found in Evans (1995a: 378–82, 84–87, 88–89, 94–96).

Suppose that in (6.188), W, X, Y and Z are words within a syntactic domain, such as a clause or a DP. For generality, let us refer to the domain simply as D. The word cl_a is a special clitic which appears to the left of those words.

(6.188) cl_a W X Y Z

One basic analytic question we can ask is, is cl_a inside domain D or outside of it? If cl_a is inside D, then we can say that the left edge of cl_a coincides with the left edge of D; if cl_a is outside of D, we can say that the right edge of cl_a abuts the left edge of D. In the analysis of particles to follow, I will assume by default that particles are outside of the domain whose edge they are adjacent to, though nothing crucial rides on that assumption.

To formalise the placement of a special clitic cl_i next to the left edge of domain D, it will be assumed here that a high ranking constraint demands the **alignment** of the right edge of cl_i with the left edge of D, as in ALIGN(cl_i, R, D, L):

(6.189) ALIGN(cl_i, Right, D, Left)
The right edge of clitic cl_i aligns with the left edge of domain D. In other words, cl_i is placed to the immediate left of D. A greater number of violations of this constraint are incurred, the further cl_i is from this position.

Suppose next that we find the arrangement in (6.190).

(6.190) cl_b cl_a W X Y Z

This can be modelled relatively easily. The first step is to rank ALIGN(cl_a, R, D, L) highly, and rank ALIGN(cl_b, R, D, L) just below it. The top-ranked constraint ALIGN(cl_a, R, D, L) demands that cl_a appear to the immediate left of D. Being the top-ranked constraint it must be satisfied, and so cl_a does appear to the immediate left of D. The lower ranked ALIGN(cl_b, R, D, L) demands that cl_b appear to the immediate left of D. The lower ranked constraint will be violated in order to allow the top-ranking constraint to be satisfied, but it will be violated minimally. For ALIGN(cl_b, R, D, L) to be violated minimally, cl_b will appear as close as possible to the left edge of D without dislodging cl_a. In fact, there are two ways to do this. One way, as shown in (6.190) above, is for cl_b to appear to the left of cl_a, so that its right edge is just one word's distance away from the left edge of D. The other way is for cl_b to be incorporated inside domain D, so that cl_b itself becomes the leftmost element of D, as in (6.191). Again, the right edge of cl_b is one word's distance away from the left edge of D.

(6.191) cl_a $[_D$ cl_b W X Y Z]

One way to favour the configuration (6.190) over (6.191) is to invoke the optimality-theoretic principle of **dependency** with respect to words in domain D,[76] via a constraint

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[76] Anderson (2005:114) employs a constraint labelled INTEGRITY(D). For the sake of consistency with phonological use of INTEGRITY, I avoid that usage here: INTEGRITY constraints are typically defined as militating against correspondences between a single element in an input representation and multiple elements in the output, rather than against 'extra' elements *per se* in the output (Benua 1995; McCarthy & Prince 1995).

DEPENDENCY(word,D) — or DEP(ω,D) for short, as defined in (6.192). DEP(ω,D) acts to keep clitics out of the domain.

(6.192) DEP(ω,D)
Each word which is present within domain D in the surface syntactic representation is also present within D in the non-surface representation.

Running counter to DEP(ω,D) is the constraint PARSE(cl_i, D) which demands cl_i be incorporated into domain D:

(6.193) PARSE(cl_i, D)
Clitic cl_i occurs within domain D (in the surface representation).

In our example, ranking DEP(ω,D) above PARSE(cl_b, D) will prevent a clitic cl_b from getting incorporated into domain D, resulting in configuration (6.190). Ranking PARSE(cl_b, D) above DEP(ω,D) would ensure that cl_b were incorporated into the domain, as in (6.191). This then, is the basic approach to the syntax of special clitics which will be used here: a combination of alignment constraints like ALIGN(cl_i, R, D, L) with DEP(ω,D) and PARSE(cl_i,D) constraints. The Kayardild particles which align in this manner are surveyed next in §6.9.2.

6.9.2 Particles which align to the immediate left and right of their domains

Before the particles are listed, which align to the immediate left and right of their domains, a word regarding particles with more than one kind of alignment behaviour.

Several Kayardild particles can appear in more the one kind of alignment position. For example, as we will see shortly the conjunction *birra* 'also' can align to the left or to the right of a DP. To cover cases like this, an ideal analysis of particle alignment in Kayardild would provide a full account of the factors controlling which of several alignment patterns a particle follows on a given occasion. However, since such an account would inevitably extend to matters of surface syntax, semantics and pragmatics which are beyond the scope of the present study, it must remain a task for future research. For present purposes the separate alignments of particles will be treated as if they were cases of distinct, homophonous clitics, distinguished for example as $birra_1$ and $birra_2$.

Particles whose right edge aligns with the left edge of the surface clause are listed in (6.194). The relevant constraints are given too (in which S stands for the surface clause). In most cases, it can be assumed that the ALIGN constraints in (6.194) are undominated by any other constraints.

(6.194) Particles whose right edge aligns with the left edge of the clause

Particle	Function	Constraints
Bana	Co-ordinator	|| ALIGN(*bana*$_1$, R, S, L), DEP(ω,S) » PARSE(*bana*$_1$,S) ||
Barri	Downgrader	|| ALIGN(*barri*, R, S, L), DEP(ω,S) » PARSE(*barri*,S) ||
Kara	Interrogative	|| ALIGN(*kara*, R, S, L), DEP(ω,S) » PARSE(*kara*,S) ||
Marrbi	'maybe'	|| ALIGN(*marrbi*$_1$, R, S, L), DEP(ω,S) » PARSE(*marrbi*$_1$,S) ||
Minyi	'and so'	|| ALIGN(*minyi*, R, S, L), DEP(ω,S) » PARSE(*minyi*,S) ||

Examples are shown in (6.195)–(6.199).

(6.195)	***Bana***	*wirril-inja-*	*ngiju-wa-*	*karba~karba-ru--d .*
	pana	wiril-iɲca-ø	ŋicu-pa-ø	kaɻpa-kaɻpa-ɻu-ṯ-ta-ø
	and.T	leaf-fOBL-T	1sg-fCOMP-T	‹dry$_{NL}$-dry$_{NL}$›-fFACT-TH-fDES-T
	and	leaf-EMO.COMP-Ø	1sg-COMP-Ø	‹dry›-FACT-Ø-DES-Ø

‘And I should dry (the baby) in leaves.’ [R2005-aug02a]

(6.196)	***Barri***	*wuu-ja*	*ni !*
	bari-a	wuː-ca	ŋi-a
	just-T	put-TH.T	3sg-T
	just-Ø	put-IMP	3sg-Ø

‘O.K, just give it back to him!’ [E384.ex.9-283]

(6.197)	***Kara***	*nying-ka*	*marri-j ?*
	kaɻa	ɲiŋ-ka	mari-ca
	INTERROG.T	2sg-T	understand-TH.T
	INTERROG	2sg-Ø	understand-ACT

‘Do you understand?’ [R2005-jul05b]

(6.198)	***Marrbi-***	*niy-a*	*nal-birdi-wa-th .*
	marpi-a	ŋi-a	ŋal-piʈi-wa-ṯa
	maybe-T	3sg-T	‹head-bad›-fINCH-TH.T
	maybe-Ø	3sg-Ø	‹crazy›-INCH-ACT

‘Maybe he went crazy.’ [E1984-08-04]

(6.199)	***Minyi-***	*wumburu-warri-*	*thaa-tha*	*bi-l-da*	*ba-lung-ka*
	miɲi-a	wumpuɻuŋ-wari-ø	ṯaa-ṯa	pi-l-ta	paṯ-ɻuŋ-ka
	and so-T	spear-fPRIV-T	return-TH.T	3-pl-T	west-fALL-T
	and so-Ø	spear-PRIV-Ø	return-ACT	3-pl-Ø	west-ALL-Ø

mutha-a	*dangka-a.*
muṯa-a	ʈaŋka-a
many-T	man-T
many-Ø	man-Ø

‘And so the many men returned westwards with no spears.’ [E385.ex.9-286]

In the second clause of (6.200), we see that *bana* aligns outside of *marrbi*, indicating that ALIGN(*marrbi*$_1$, R, S, L) is ranked above ALIGN(*bana*$_1$, R, S, L).

(6.200)

Yakuri-wuu-ntha-	*warra-j-uu-ntha,*	***bana***	***marrbi*-**
jakuɻi-kuu-in̪t̪a-ø	wara-c-kuu-in̪t̪a-ø	pana	marpi-a
fish-fPROP-fOBL-T	go-TH-fPROP-fOBL-T	and.T	maybe-T
fish-POT-COMP-Ø	go-TH-POT-COMP-Ø	and	maybe-Ø

bijarrba-wuu-ntha-	*ngiju-wa-*	*kaba-th-uu-ntha-*
picarpa-kuu-in̪t̪a-ø	ŋicu-pa-ø	kapa-t̪-kuu-in̪t̪a-ø
dugong-fPROP-fOBL-T	1sg-fCOMP-T	find-TH-fPROP-fOBL-T
dugong-POT-COMP-Ø	1sg-COMP-Ø	find-TH-POT-COMP-Ø

'I'll go to the fish and maybe I'll find dugong.' [R2005-aug02a]

Just one particle, *maraka*$_1$, aligns to the right of the clause, as shown in (6.202). This is analysed as due to an undominated constraint ALIGN(*maraka*$_1$, L, S, R).

(6.201) Particle whose left edge aligns with the right edge of the clause

Particle	Function	Constraints
Maraka$_1$	Counterfactual	|| ALIGN(*maraka*$_1$, L, S, R), DEP(ω,S) » PARSE(*maraka*$_1$,S) ||

(6.202)

Nalkurdalaayarrba-wu	*nguku-uru-*	*diya-j-u-*	***marak*- .**
ɳalkuʈalaːjarpa-kuu-	ŋuku-kuɻu-ø	ʈia-c-kuu-ø	maɻaka-ø
(place name)-fPROP-T	water-fPROP-T	eat-TH-fPROP-T	CTRFCT-ø
(place name)-FUT-Ø	water-FUT-Ø	eat-Ø-POT-Ø	CTRFCT-T

'(The horse) should have drunk at Nalkurdalaayarrb.' [E1987-09-01]

Several particles take semantic scope over a DP. Those whose right edge aligns with the left edge the DP are listed, with their constraints, in (6.203). Examples are shown in (6.204)–(6.209). For all particles to follow, PARSE(*cl*$_i$,S) outranks DEP(ω,S), meaning that the particle is incorporated into the clause. However, DEP(ω,DP) always outranks PARSE(cl_i,DP) for particles cl_i in Kayardild: particles are never incorporated into DP.

(6.203) Particles whose right edge aligns with the left edge of DP

Particle	Function	Constraints
Bana	Co-ordinator	ALIGN(*bana*$_2$, R, DP, L)
Birra	'also'	ALIGN(*birra*$_1$, R, DP, L)
Maraka	Counterfactual	ALIGN(*maraka*$_2$, R, DP, L)
Marrbi	'maybe'	ALIGN(*marrbi*$_2$, R, DP, L)
Namu, numu	Negator	ALIGN(*namu*$_1$, R, DP, L)

(6.204) *Wungi-j-irrin-jiy-a* *wuran-kiy-a* ***bana*** *ngurruwarra-walath-i- !*
wuŋi-c-iriɲ-ki-a wuɻan-ki-a pana ŋuruwara-palat̪-ki-a
steal-TH-fRES-fLOC-T food-fLOC-T and.T fishtrap-fPL-fLOC-T
steal-Ø-RES-EMP-Ø food-EMP-Ø and fishtrap-EMP-Ø
'(Look at this) poached food and fishtraps!' [R2005-jul19a]

(6.205) *Mutha-a* *ngambu-,* ***bana*** *ngarn-d,* ***bana*** *wambal-d.*
mut̪a-a ŋampu-a pana ŋaɳ-ta pana wampal-ta
many-T well-T and.T beach-T and.T bush-T
many-Ø well-Ø and beach-Ø and bush-Ø
'There are lots of wells, both beach ones, and bush ones.' [E395.ex.9-335]

(6.206) *Kurri-ja* *manarr-i,* *maraka-* *dangka-karran-ji-,*
kuri-ca manar-ki-a maɻaka-ø t̪aŋka-karaɲ-ki-a
see-TH.T bark torch-fLOC-T CTRFCT-ø man-fGEN-fLOC-T
see-IMP bark torch-INS-Ø CTRFCT-T man-GEN-INS-Ø

birra *ni-wan-ji- .*
pira ni-paɲ-ki-a
ALSO.T 3sg-fPOSS-fLOC-T
ALSO 3sg-POSS-INS-Ø
'(They) saw a bark torch, and wrongly thought it was the man's, that it too was his.' [E379.ex.9-256]

(6.207)	*Dathina*	*dangka-a*	***maraka**-*	*ngij-in-da*	*kanthathu-*
	ʈat̪ina	ʈaŋka-a	maɻaka-ø	ŋicu-iɲ-ta	kan̪t̪at̪u-a
	that.T	man-T	CTRFCT-ø	1sg-fPOSS-T	father-T
	that	man-Ø	CTRFCT-T	1sg-POSS-Ø	father-Ø

kirrk-a	*miburl-d.*
kirk-ka	mipuɻ-ta
‹nose-T	eye-T›
‹face-Ø	›

‘That man looks like my father (lit. is like my father’s face).’ [W1960]

(6.208)	*Jatha-a*	*kuna~wuna-*	*ngaarrngi-j-,*	***marrbi**-*	*yarbu-d,*
	cat̪a-a	kuna-kuna-ø	ŋaːrŋi-ca	marpi-a	jaɻput̪-ta
	other-T	‹child$_{NL}$-child$_{NL}$›-T	presage-TH.T	maybe-T	snake-T
	other-Ø	‹child›-Ø	presage-ACT	maybe-Ø	snake-Ø

***marrbi**-*	*balangkali-,*	*rijurl-d.*
marpi-a	palaŋkali-a	ɻicuɻ-ta
maybe-T	brown snake-T	python-T
maybe-Ø	brown snake-Ø	python-Ø

‘(The conception of) another child might be shown by a snake, maybe a brown snake, maybe a python.’ [E388.ex.9-301]

(6.209)	*Ngirri~ngirriy-a*	*ngudii--ja*	*bi-l-d,*	*mutha-a*
	ŋiri-ŋiri-a	ŋuti-i-ca	pi-l-ta	mut̪a-a
	‹splaying$_{NL}$-splaying$_{NL}$›-T	throw-fMID-TH.T	3-pl-T	many-T
	‹splaying›-Ø	throw-MID-ACT	3-pl-Ø	many-Ø

dangka-a,	***namu***	*warngii-da,*	*mutha-a*	*dangka-a.*
ʈaŋka-a	namuu-ø	waɻŋiːc-ta	mut̪a-a	ʈaŋka-a
man-T	no-ø	one-T	many-T	man-T
man-Ø	no-T	one-Ø	many-Ø	man-Ø

‘They (the initiates) are thrown out (into the water), many men, not one, many men.’ [R2005-jul21]

Particles which take scope over a DP, and whose left edge aligns with the right edge of the DP are listed, with their constraints, in (6.210). Examples are shown in (6.211)–(6.212).

(6.210)

Particle	Function	Constraints
Bana	'also'	ALIGN(*bana*$_3$, L, DP, R)
Birra	'also'	ALIGN(*birra*$_2$, L, DP, R)

(6.211)

Nga-da	***ban .***
ŋat̪-ta	pana
1sg-T	ALSO.T
1sg-Ø	ALSO

'Me too.' [E395.ex.9-334]

(6.212)

Dangka-wala	***birra***	*wirdi-ja,*	*mutha-a*	*dangka-a.*
ʈaŋka-pala	pira	wiʈi-ca	mut̪a-a	ʈaŋka-a
person-fPL.T	ALSO.T	be-TH.T	many-T	person-T
person-PL	ALSO	be-ACT	many-Ø	person-Ø

(Having discussed the stars, the topic turns to their mythological origins):
'They were people too, many people.' [R2005-jul21]

Two particles align to the immediate left of the main verb of the clause.[77] They are listed, with their constraints, in (6.213). Examples are shown in (6.214)–(6.216).

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[77] Both *bayambaya* and *namu/numu* are recent borrowings from English (from *by-and-by* and *no more*), via Mornington English or perhaps Lardil into Kayardild. A route via Lardil would explain the rigid pre-verbal positioning. No native Kayardild particle takes this position, but Lardil possesses several strictly pre-verbal particles (Klokeid 1976: 263). Evans transcribes the former particle as *baymbay*, perhaps implying a lexical representation /pajmpaj/, which would violate Kayardild phonotactics by containing coda glides and lacking a final vowel. I analyse it as /pajampaja/, a phonotactically regular word. In casual speech /aja/ may become /aˑ/, thus in breath group final position

(6.213)	Particle	Function	Constraints
	Bayambaya	Warning	ALIGN(*bayambaya*, R, V, L)
	Namu, numu	Negator	ALIGN($namu_2$, R, V, L)

(6.214)	*Dirra-yarbuth-iy-a*	***bayambaya-***	*kurirrwa-tha*	*kuna-wala-d !*
	ʈira-jaɻpuṯ-ki-a	pajampaja-ø	kuɻirwa-ṯa	kuna-palaṯ-ta
	‹rain-animal›-fLOC-T	WARNING-T	die-TH.T	child$_{\text{NL}}$-fPL-T
	‹cyclone›-INS-Ø	WARNING-Ø	die-ACT	child-PL-Ø

‘The children could die in the cyclone.’ [R2005-aug02a]

(6.215)	*Nga-da*	***namu-***	*kurri-ja*	*kakuju- .* [78]
	ŋaṯ-ta	namuu-ø	kuri-ca	kakucu-a
	1sg-T	no-ø	see-TH.T	MoBr-T
	1sg-Ø	no-T	see-ACT	MoBr-Ø

‘I didn’t see at my uncle’. [2005-jun29]

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bayambaya can be realised phonetically as [paˑmpaj]. Incidentally, the word listed as ‘*wambaya*’ in Evans’ dictionary (Evans 1992:158; 1995a:778) can also be identified as *bayambaya,* with the lenited, casual realisation [waˑmpaja]: its meaning and syntax in the one example sentence ‘*Ngada wambaya waaja birdiruth*’ ‘I’ll sing it wrong and spoil it’ corresponds exactly to that of *bayambaya*.

Namu is borrowed in Kayardild with an underlyingly double final vowel /uu/, the usual transposition of English [oː] (in non-rhotic, Australian English, *more* is [moː] or [moə]). The double final vowel /uu/ conditions the appearance of a zero termination (T), yielding the post-lexical form (after word final reduction, cf Ch.2 §2.2.1.2) [namu]. Were the underlying form /namu/, with short /u/, it would take the termination /a/, giving post-lexical [namua], which is not what is found.

[78] *Namu* is documented before imperative verbs in Evans (1995a: 388–89), but also appears before TH-TAM:actual and TH-TAM:potential verbs as shown in (6.215)–(6.216).

(6.216)	***Namu-***	*kamburi-j-u-*	*wirdi-j-u-*	*nga-ku-l-d.*
	namuu-ø	kampuɻi-c-kuu-ø	wiṯi-c-kuu-ø	ŋa-ku-l-ta
	no-ø	talk-TH-fPROP-T	stay-TH-fPROP-T	1-2-pl-T
	no-T	talk-Ø-POT-Ø	stay-Ø-POT-Ø	1-2-pl-Ø

‘We won’t stay and talk.’ [R2005-jul21]

6.9.3 Particles and surface syntax more generally

Until now, the focus in §6.9 has been on the surface syntactic position of particles, without much comment being offered on the rest of the clause, apart from the mention of dependency constraints on words in domains. Presumably though, in the kind of grammatical model being entertained here, a great deal of the surface syntax of Kayardild could plausibly be modelled in terms of alignment of some sort, and ranked constraints. Although Kayardild word order is notionally ‘free’, strong biases in actual word order are readily apparent, and while the exploration of such matters is beyond the scope of this dissertation, I will assume that pragmatic and discourse factors play a key role in determining or at least restricting surface word order (for recent overviews of research into pragmatically determined word order in Australian languages see Austin 2001; Mushin 2005; Baker & Mushin 2008). As but one example, it is common for a sequence of juxtaposed, co-referential DPs referring to a place to begin with a demonstrative (i.e., deictic) DP, and be followed by a more semantically contentful DP, as can be seen above in examples (6.60) on p.502, (6.112) on p.555 and (6.155) on p.580.

Returning to our main concern, particles, there are some cases in which the alignment of particles at the edge of their domain interacts with the alignment of other, non-particle constituents with the same edge. Consider a sequence like that shown in (6.217).

(6.217) $[_D$ W cl_i X Y Z]

I will assume that clitics cl_i in configurations like (6.217) are parsed into domain D.[79] The kind of configuration shown in (6.217), where W, X, Y and Z are DPs, occurs in Kayardild, and will be analysed here in terms of the left edges both of W and cl_i being required to align with the left edge of domain D. A partial ranking of || ALIGN(W, L, D, L) » ALIGN(cl_i, L, D, L) || ensures that W is at the very edge, and cl_i as close as possible without dislodging W. In addition, ranking PARSE(cl_i, D) over DEP(ω,D) ensures that cl_i is incorporated within domain D. Particles which interact in this way with the alignment of non-particle material are examined in §6.9.3.1, after which attention will shift to more general matters regarding surface syntax in §6.9.3.2.

6.9.3.1 Interacting alignment of particles and non-particles

The particles *maraka*$_2$ and *mara* appear either as the leftmost word of the clause, or after the first DP.[80] Examples are shown in (6.218)–(6.220).

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[79] An alternative analysis would treat cl_i as outside of D by allowing domain D to be discontinuous. I assume that this possibility is blocked by a high ranking constraint CONTIGUITY(D) which rules out discontinuous D.

[80] As we would expect, a particle which aligns outside the clause is not taken into account, as can be seen in (a) and (b):

(6.218)

Mara	*nga-da*	*kiyamanda*[81]	*baa-j-u-,*	*dan-ku-.*
maɻa	ŋat̪-ta	?kiaman-ta	paː-c-kuu-ø	t̪an-kuu-ø
CTRFCT.T	1sg-T	?	bite-TH-fPROP-T	this-fPROP-T
CTRFCT	1sg-Ø	?	bite-Ø-fPROP-Ø	this-FUT-Ø

Dan-ku-	***mara***	*kiyamanda*	*nga-da*	*baa-j-u-,*
t̪an-kuu-ø	maɻa	?kiaman-ta	ŋat̪-ta	paː-c-kuu-ø
this-fPROP-T	CTRFCT.T	?	1sg-T	bite-TH-fPROP-T
this-FUT-Ø	CTRFCT	?	1sg-Ø	bite-Ø-fPROP-Ø

kalatharrma-th-u- .
kalat̪arma-t̪-kuu-ø
turn over-TH-fPROP-T
turn over-Ø-POT-Ø
(Discussing the manufacture of shell knives, made by biting the shell):
'I should bite it, here. I should bite it here and turn it over.' [R2005-jul02]

(6.219)

Maraka-	*ri-in-da*	*wanjii-j-u-*	*ni-.*
maɻaka-ø	ɻi-in-ta	waɲciː-c-kuu-a	ŋi-a
CTRFCT-ø	east-fFRM-T	ascend-TH-fPROP-T	3sg-T
CTRFCT-T	east-ABL-Ø	ascend-Ø-POT-Ø	3sg-Ø

'He should have come up from the east.' [R2007-may22]

(a)

Bana	***maraka-***	*niy-a*	*kurdaliya-th-u-.*
and	CTRFCT-T	3sg-Ø	cut-Ø-POT-Ø

'And he should have cut (the spears)'. [E1984-10-01]

(b)

Bana	*nga-ku-l-da*	***maraka-***	*kurri-j-uru-y-a*
and	1-2-pl-Ø	CTRFCT-T	look-Ø-POT-EMP-Ø

'And we should go look (at it).' [R2005-jul08]

[81] The meaning of *kiyamanda* is not clear. Presumably it is a manner adverb with the underlying stem /kiaman-/.

(6.220)	[$_{\text{DP}}$ *Dan-da*	*jardiy-a*]	***maraka-***	*mungurruw-a*	*wirdi-j-u-* .
	ʈan-ta	caʈi-a	maɻaka-ø	muŋuru-a	wiʈi-c-kuu-ø
	this-T	group-T	CTRFCT-ø	knowledgeable-T	be-TH-fPROP-T
	this- Ø	group-Ø	CTRFCT-T	knowledgeable-Ø	be-Ø-POT-Ø

‘That lot should have known.’ [R2005-jul08]

The analysis here of sentences such as (6.219)–(6.220) will be that a constraint such as ALIGN(*maraka*$_2$, L, S, L) demands *maraka*$_2$ be first in the clause, but that it is outranked by another constraint which for present purposes I assume to be something like ALIGN(DP$_{\text{PROMINENT}}$, L, S, L). This latter ALIGN constraint ensures that a ‘prominent’ DP, if one is present in the clause, will be first. Presumably some principle of discourse will either identify a DP in the clause as ‘prominent’, or it will identify no such DP.[82] The important point for now is that if there exists a ‘prominent’ DP in the clause, then it aligns further to the left than *maraka*$_2$. There is also a second point to be noted here, in relation to example (6.220). Although the ranking of ALIGN(DP$_{\text{PROMINENT}}$, L, S, L) over ALIGN(*maraka*$_2$, L, S, L) ensures that DP$_{\text{PROMINENT}}$ is leftmost in the clause, it does not of itself stop a particle like *maraka*$_2$ from appearing *inside* the DP as in (6.221). In terms of the alignment constraints alone, (6.221) would actually be preferable to (6.220) because *maraka*$_2$ is closer to the left edge of the clause.

(6.221)	* *Dan-da*	***maraka-***	*jardiy-a*	*mungurruw-a*	*wirdi-j-u-* .
	this- Ø	CTRFCT-T	group-Ø	knowledgeable-Ø	be-Ø-POT-Ø

[82] The question of what the proper definition of ‘prominent’ is, is an important one, but not one that can be answered here.

What prevents a surface configuration like (6.221) from obtaining is the ranking of Dep(ω,DP) above Parse(*maraka*$_2$, DP), which keeps *maraka*$_2$ outside of the DP.

We have now seen the syntax of a particle interact with a 'prominent' DP, where 'prominence' seems to be determined by something independent of the particle itself. A variation on this situation is found in clauses containing the particles *maarra*$_1$ and *maarra*$_2$, in which the selection of the prominent DP is clearly correlated to the presence of the particle. In clauses with *maarra*$_1$ 'all', the particle takes scope over a DP and that DP is selected as DP$_{\text{PROMINENT}}$ and so appears leftmost in the clause (more on which shortly). In clauses containing *maarra*$_2$ 'SUBJECT all/only do/be PREDICATE', the subject is selected as DP$_{\text{PROMINENT}}$. Let us turn now to the alignments of *maarra*$_1$ and *maarra*$_2$.

Maarra$_1$ always aligns to the left of the clause, and outside of it. That is, Align(*maarra*$_1$, R, S, L) is highly ranked and Dep(ω,S) dominates Parse(*maarra*$_1$, S). Thus, in cases where it takes scope over an overt DP, *maarra*$_1$ appears first (outside of the clause) and the DP over which it takes scope, which is selected as DP$_{\text{PROMINENT}}$, appears next (leftmost within the clause), by virtue of Align(DP$_{\text{PROMINENT}}$, L, S, L). An example is shown in (6.222).[83]

(6.222)	***Maarra-***	*dulk-a*	*kinaa-j-arri- .*
	ma:ra-ø	ʈulk-ka	kina:-c-wari-a
	all-T	place-T	tell-TH-fPRIV-T
	all-Ø	place-Ø	tell-Ø-NEG.ACT-Ø
	'(I) haven't told you about all the places.' [E386.ex. 9-289]		

[83] The DP *dulka* in (6.222) is a topic DP.

If the DP over which *maarra*$_1$ takes scope is elided as in (6.223), then *maarra*$_1$ still appears to the left of the clause.

(6.223) ***Maarra***- *thaliy-a* *wanjii-j* .
maːra-ø t̪ali-a waɲciː-ca
all-T laden-T ascend-TH.T
all-Ø laden-Ø ascend-ACT
'All (the people) come up carrying something.' [R2007-may15c]

Maarra$_2$ is somewhat different. *Maarra*$_2$ has more of a clausal scope, and in clauses containing *maarra*$_2$ it is subject DPs which are obligatorily selected as DP$_{\text{PROMINENT}}$. When the subject DP$_{\text{PROMINENT}}$ is overt, *maarra*$_2$ appears to its right, as shown in (6.187) above, and (6.224).

(6.224) *Dan-da* *dulk-a* ***maarra***- *kala-th-irrin-d-*.
t̪an-ta t̪ulk-ka maːra-ø kala-t̪-iriɲ-ta
this-T place-T all-T cut-TH-fRES-T
this-Ø place-Ø all-Ø cut-Ø-RES-Ø
(Referring to the creation myth in which Rock Cod thrashes across the land, cutting the Wellesley islands apart from one another):
'This place is all cut-up (land).' [R2005-jul14b]

When the subject DP is elided *maarra*$_2$ appears at the very left edge of the clause, as in (6.225).

(6.225)	***Maarra***-	*kurri-ja*	*ngij-in-ji-,*	*kamburi-j-arri-* .
	maːra-ø	kuri-ca	ŋicu-iɲ-ki-a	kampuɻi-c-wari-a
	all-T	see-TH.T	1sg-fPOSS-fLOC-T	talk-TH-fPRIV-T
	all-Ø	see-ACT	1sg-Ø-INS-Ø	talk-Ø-NEG.ACT-Ø

‘(He) just looked at me without saying anything.’ [E387.ex.9-295]

The alignment of *maarra*$_2$ is therefore essentially like *mara* and *maraka*$_2$ above, and is analysed in terms of ALIGN(*maarra*$_2$, L, S, L) ranking below ALIGN(DP$_{\text{PROMINENT}}$, L, S, L), and PARSE(*maarra*$_2$, S) ranking over DEP(ω,S).

A final point of interest concerns a case where more than one DP is selected as DP$_{\text{PROMINENT}}$. At present I have just one example of this, shown in (6.226).[84]

(6.226)	[$_{\text{DP}}$ *Dan-da*]	[$_{\text{DP}}$ *ba-lung-ka*]	***maarra***-	*natha-rnurru-walath-i-d* .
	t̪an-ta	pat̪-ɻuŋ-ka	maːra-ø	ŋat̪a-ŋuru-walat̪-ic-ta
	here-T	west-fALL-T	all-T	camp-fASSOC-‹fPL-fSAME›-T
	here-Ø	west-ALL-Ø	all-Ø	camp-ASSOC-‹EVERY›-Ø

‘Here in the west (it) was all camps.’ [R2007-jul12c]

In (6.226), the two juxtaposed subject DPs are both placed closer to the left edge of the clause than is *maarra*$_2$. The configuration in (6.226) is consistent with the hypothesis that multiple, juxtaposed DPs will be selected together as multiple ‘prominent’ DPs. The word order in (6.226) — in which the two subject DPs precede *maarra* — is predicted by the ranking of ALIGN(DP$_{\text{PROMINENT}}$, L, S, L) over ALIGN(*maarra*$_2$, L, S, L). The fact that *danda*

[84] I have no other examples of ‘prominent’ DPs which are juxtaposed with other DPs, whether the other DPs are prominent or not.

precedes *balungka* would be due to the kinds of constraints on the ordering of juxtaposed DPs discussed at the beginning of §6.9.3.

6.9.3.2 Surface syntax more generally

In §6.9.3.1 we saw the surface syntactic positions of 'prominent' DPs being subject to alignment constraints. When this occurred, the DPs interacted with particles in a manner which could be coherently modelled using the tools already developed for describing particle syntax. Here I briefly consider other ways in which Kayardild surface syntax more generally can be understood in terms of mechanisms already introduced in the account of particles.

An obvious starting point is the surface syntax of motion adverbs, discussed in §6.5.5. These always appear immediately to the right of the main verb of the clause, and could be analysed in terms of an undominated constraint ALIGN(AdvP$_{\text{MOTION}}$, L, V, R).

Potentially more interesting though, are some global properties of Kayardild surface syntax. We have already seen in the examination of particle syntax, that no PARSE constraint on particles dominates DEP(ω,DP) — that is, no new words are incorporated into DPs because DEP(ω,DP) is too highly ranked. Two more properties of DPs which could be captured in terms of high ranked constraints, are their contiguity on the surface (i.e., there are no discontinuous DPs), which would follow from a high ranking constraint CONTIGUITY(DP), and the fact that word order in DPs is the same at the surface as in the non-surface representation, which can be analysed in terms of the high ranking constraint LINEARITY(DP). These properties and constraint rankings for DPs can be compare to those of other constituents, such as S and VP. The clause, S, is contiguous at the surface, but non-surface word order is not preserved: CONTIGUITY(S) would rank high, but LINEARITY(S) would be crucially dominated, for example by constraints on the position of 'prominent' DPs. VPs are neither contiguous at the surface nor is their non-surface word order retained, and so both CONTIGUITY(VP) and LINEARITY(VP) would be dominated by other constraints on word order.

The point of these observations is as follows. Most of this chapter has been concerned with ascertaining the nature of a non-surface syntactic structure in Kayardild. Nevertheless, this non-surface structure is not all that far removed from surface structure if we view the two structures as correlated in terms of some kind of grammar of constraints on surface configurations and on correspondence relationships between surface and non-surface syntax (indeed, one could even relate the two to other 'non-surface', 'conceptual', or 'deep' structures in a similar fashion).

6.9.4 Particle-like DPs

In addition to true particles, Kayardild possesses a small set of nominal words with particle-like semantics, which are analysed as *particles* in Evans (1995a), particularly as *pre-verbal particles* (1995a: 298–302).[85] Unlike true particles though, these nominal words generally do inflect, and their word order is freer that that of true particles: even the 'pre-

[85] Evans (1995a: 298–302) does not state outright that 'pre-verbal particles' *must* appear either immediately pre-verbally or even pre-verbally at all, although this seems to be implied, at least as a default.

verbal particles' do not always appear in strictly preverbal position. As a case study, let us take particle-like DPs built on the nominal stems *buth-* /put̪/ and *yuuth-* /juːt̪/.

The nominal stems *buth-* and *yuuth-* can be used in a spatial sense as 'behind' and 'ahead' respectively, or in a temporal sense, as 'later' and 'already'. The appropriately inflected or uninflected nominal word will appear as the N head in an otherwise empty DP. In the spatial sense, a *buth-* or *yuuth-* DP is a daughter of VP_{β},[86] and so fails to inherit A-TAM:instantiated (which attaches to VP_{α}), as shown in (6.227)–(6.228).

(6.227)	*Niy-a*	***bu-da***	*ra-yin-d,*	*mura-tha*	*wanjii-j*
	n̪i-a	put̪-ta	ɻa-in-ta	muɻa-t̪a	waɲciː-ca
	3sg-T	behind-T	south-fFRM-T	graze-TH.T	ascend-TH.T
	3sg-Ø	behind-Ø	south-ABL-Ø	graze-ACT	ascend-ACT

'(The dugong) is coming behind from the south, coming up to graze.' [E311.ex.8-59]

[86] There may be some interspeaker variation on this point, with some speakers placing the spatial *buth-* DP as daughter of VP_{α} in which case it inflects for A-TAM:instantiated. Sally Gabori produced the sentence in (a), and Dawn Naranatjil has been recorded self-correcting from *buthi* (with inflection for A-TAM:instantiated) to *buda* (without it) in an A-TAM:instantiated sentence.

(a)	*Warngii-da*	*warra-ja*	***buth-i***-.
	waɻŋiːc-t̪a	wara-ca	put̪-ki-a
	one-T	go-TH.T	behind-fLOC-T
	one-Ø	go-ACT	behind-INS-Ø

'One (raft) went at the back.' [R2007-jun01]

(6.228)	*Warngii-da*	*dangka-a*	***yuu-da***	*ri-in-d.*
	waɻŋiːc-ta	ʈaŋka-a	juːt̪-ta	ɹi-in-ta
	one-T	person-T	ahead-T	east-fFRM-T
	one-Ø	person-Ø	ahead-Ø	east-ABL-Ø

‘One man is up ahead coming from the east.’ [W1960]

As expected though, a *buth-* or *yuuth-* DP does inherit and inflect for A-TAM values such as A-TAM:present (6.229) and A-TAM:future (6.230), which attach to VP_{β}.

(6.229)	*Wanku-y-a*	*dathin-kiy-a*	*ri-in-kiy-a*	***buth-urrka-***
	wanku-ki-a	ʈat̪in-ki-a	ɹi-in-ki-a	put̪-kurka-ø
	shark-fLOC-T	that-fLOC-T	east-fFRM-fLOC-T	behind-fLOC.fOBL-T
	shark-EMP-Ø	that-EMP-Ø	east-ABL-EMP-ø	behind-PRES.COMP-Ø

jinka-j-urrka-	*bi-lu-wan-jurrk-!*
cinka-c-kurka-ø	pi-lu-paɲ-kurka-ø
follow-TH-fLOC.fOBL-T	3-pl-fPOSS-fLOC.fOBL-T
follow-Ø-IMMED.COMP-Ø	3-pl-Ø-PRES.COMP-Ø

‘A shark there coming from the east is following behind them!’ [W1960]

(6.230)	***Yuuth-u-***	*jirrkara-wu-*	*kurri-j-u-*	*nga-ku-l-d.*
	juːt̪-kuu-ø	cirkaɻa-kuu-ø	kuri-c-kuu-ø	ŋa-ku-l-ta
	ahead-fPROP-T	north-fPROP-T	look-TH-fPROP-T	1-2-pl-T
	ahead-FUT-Ø	north-FUT-Ø	look-Ø-POT-Ø	1-2-pl-Ø

‘We’ll look in the north first.’ [E299.ex.8-5]

In their temporal sense *buth-* and *yuuth-* DPs position higher in the non-surface clause and so do no inflect for A-TAM:future or A-TAM:prior, as illustrated in (6.231)–(6.232). These DPs need not immediately precede the verb, as shown in (6.233), or precede it at all, as in (6.231).

(6.231)	*Niy-a*	*dali-j-u-*	***bu-d*,**	*warrku-ntha-*	*thula-th-uu-ntha- .*
	ɳi-a	ʈali-c-kuu-ø	puʈ̪-ta	warku-in̪t̪a-ø	ʈ̪ula-ʈ̪-kuu-in̪t̪a-ø
	3sg-T	come-TH-fPROP-T	later-T	sun-fOBL-T	descend-TH-fPROP-fOBL-T
	3sg-Ø	come-ø-POT-Ø	later-Ø	sun-COMP-Ø	descend-TH-POT-COMP-Ø

‘He will come later, when the sun goes down.’ [W1960]

(6.232)	*Jatha-a*	*dangka-a*	***yuu-da***	*jaa-j-arra-*	*wida--na- .*
	cat̪a-a	ʈaŋka-a	juːt̪-ta	caː-c-ŋara-ø	wita-ki-naa-ø
	other-T	person-T	already-T	enter-TH-fCONS-T	hole-fLOC-fABL-T
	other-Ø	person-Ø	already-Ø	enter-Ø-PST-Ø	hole-Ø-PRIOR-Ø

‘Someone else has already checked this hole (for fish).’ [E299.ex.8-3]

(6.233)	*Kirrk-a*	*ngarrku-wa-th- ,*	*bardaka-*	*naa-j ,*
	kirk-ka	ŋarku-wa-t̪a	paʈaka-ø	ŋaː-ca
	nose-T	hard-fINCH-TH.T	belly-T	burn-TH.T
	nose-Ø	hard-INCH-ACT	belly-Ø	burn-ACT

yuu-da	*nga-da*	*wirdi-ja*	*bayi-.*
juːt̪-ta	ŋat̪-ta	wiʈi-ca	pai-a
already-T	1sg-T	be-TH.T	angry-T
already-Ø	1sg-Ø	be-ACT	angry-Ø

‘My face becomes stern, my stomach burns, already I am becoming angry.’ [E650]

The word order and inflection of other words which are analysed as particles in Evans (1995a) but as nominal words within a DP here, can be summarised as follows.

Particle-like DPs built on *kada-* ‘again’ appear in several positions in the non-surface syntax, often inflecting for A-TAM and COMPLEMENTISATION, and need not be immediately pre-verbal (see Appendix B, §§B.2.5;B.7.3).

DPs built on *ki-* ‘partway’ inflect for A-TAM and need not be immediately pre-verbal (see Evans 1995a:300–01).

Evans reports that *minyi* 'towards' does not inflect for A-TAM (1995a: 298), but the three examples provided (1995a: 302) are inconclusive: each clause associates with A-TAM:instantiated, which is realised by fLOC, and the fLOC inflection of /i/-final stems such as *minyi* /miɲi/ is identical to the uninflected form.

DPs built on *nginja-* 'FRUSTRATED' (see Evans 1995a: 382–84) are daughters of VP_β and so inflect, for example, for A-TAM:future (Evans 1995a: 383.ex.9-273).

Data on *kalala* 'really' is scarce, but there is no positive reason to treat it as other than a nominal word, given that it can function inside a DP as a modifier meaning 'true' (Evans 1995a: 384).

The nominal *bantharr-* 'some; some other(s)' (Evans 1995a: 387) is a determiner rather than a particle, and inflects along with the rest of the DP as shown in (6.234).

(6.234)	***Bantharr-u-***	*ngunguk-u-*	*marri-j-u-*	*nga-ku-lu-wan-ju-.*
	pan̪t̪ar-kuu-ø	ŋuŋuk-kuu-ø	mari-c-kuu-ø	ŋa-ku-lu-paɲ-kuu-ø
	some-fPROP-T	story-fPROP-T	listen-TH-fPROP-T	1-2-pl-fPOSS-fPROP-T
	some-FUT-Ø	story-FUT-Ø	listen-Ø-POT-Ø	1-2-pl-POSS-FUT-Ø
	'We'll listen to some other stories of ours' [R2005-jul21]			

6.10 Inflection and recursion

Let us turn now to the topic of recursion in the inflectional morphology of Kayardild. Given the nature of concord in Kayardild, our expectation is that words in deeply embedded syntactic positions should often be inflected for large numbers of morphosyntactic features. Moreover, since it is possible to embed multiple constituents of the same type within one another (e.g. VP in VP; DP in DP), we expect that features associated with those types of nodes should recur in association with single words: for example, we should find words which inflect for multiple A-TAM features, multiple CASE features or multiple NUMBER features. The first purpose of this section is to confirm that this is the case, by providing examples of attested recursive morphological structures in §6.10.1. The second purpose is to consider the apparent existence of an upper limit to the morphological complexity of Kayardild words. In §6.10.2 it is argued that any constraints which exist on the complexity of Kayardild words do not appear to be specifically morphological in nature. Finally, the existence of 'recursion', or something like it, in Kayardild has not gone unnoticed in the formal literature. Existing, formal studies of inflectional recursion in Kayardild are mentioned in §6.11, and implications for them are noted of the revised analysis of the Kayardild facts which has been proposed in this chapter, relative to Evans (1995a).

6.10.1 Recursive features, and pairwise ordering

Table (6.235) lists the morphosyntactic features, of which multiple tokens have been attested, each with an overt realisation, in association with a single word. Cross references are given to examples, some of which follow, after which discussion continues below.

(6.235)

Feature	In ex. ,	word	Values
NUMBER	(6.236)	*makuyarrnurrunabawala*	DU, PL
CASE	(6.177)	*ngimiwaanjinabawu*	ORIG, ABL, PROP
A-TAM	(6.237)	*dangkawalanymarrawu*	FUNC, FUT

(6.236) NUMBER–CASE–CASE–NUMBER

maku-yarr-nurru--naba-wala
maku-kiarŋ-ɳuru-ki-napa-palaː
woman-fDU-fASSOC-fLOC-fABL-fPL.T
woman-DU-ASSOC-Ø-ABL-PL
'the many belonging to (those) having two wives' [E116]

(6.237) NUMBER–A-TAM–A-TAM

Nga-da	*jungarra-wu-*	*wangalk-u-*	*barrki-j-u-*
ŋat̪-ta	cuŋara-kuu-ø	waŋalk-kuu-ø	parki-c-kuu-ø
1sg-T	big-fPROP-T	boomerang-fPROP-T	cut-TH-fPROP-T
1sg-Ø	big-FUT-Ø	boomerang-FUT-Ø	cut-Ø-POT-Ø

dangka-walany-marra-wu-	*bala--n-ku-.*
ʈaŋka-palat̪-mara-kuu-ø	pala-t̪-n-kuu-ø
person-fPL-fUTIL-fLOC-T	kill-TH-fN-fPROP-T
person-PL-FUNC-FUT-Ø	kill-Ø-PROG-FUT-Ø

'I will cut a big boomerang for killing people.' [W1960]

Table (6.235) refers to recursive instances of NUMBER, CASE and A-TAM. On the other hand recursive instances of COMP, TH-TAM and NEGATION are all unattested. Recursive COMP is unattested for reasons of feature percolation that were discussed in §6.5.2.1 — it is impossible for any node to acquire more than one COMP feature. Recursive TH-TAM and NEGATION are unattested because in order for them to occur, one would need to find an appropriate word[87] within a VP embedded within a DP inflected for a thematic CASE value. However as noted in §6.5.2.2 embedded VPs within DP are only attested in subject and direct object DPs (which take CASE:Ø) and instrument DPs in CASE:proprietive. As

[87] Namely a verbal word or a word within a DP inflected for thematic CASE.

such, the absence of recursive TH-TAM and NEGATION is ultimately due to syntactic factors rather than morphological ones.

Table (6.238) lists pairs of distinct features F, G which have been attested being overtly realised on the same word, and such that feature F attached to a syntactic node which was either lower than, or identical to, the node to which G attached.[88] Again, cross references are given to examples, several of which follow.

(6.238)

Feature F	Feature G	In ex. ,	word	Values
NUMBER	CASE	(6.239)	*bankiwalanurruya*	PL, ASSOC
	A-TAM	(6.240)	*widawalathuuntha*	PL, FUT
	COMP	(6.241)	*dangkawalathinj*	PL, COMP
CASE	NUMBER	(6.242)	*natharnurruwalathina*	ASSOC, PL
	A-TAM	(6.76)	*Murdumurduwaanju*	ORIG, FUT
	TH-TAM	(6.76)	*jingkarmaruthu*	DAT, POT
	COMP	(6.243)	*ngukumarranth*	UTIL, COMP
A-TAM	COMP	(6.240)	*widawalathuuntha*	FUT, COMP
TH-TAM	NUMBER	(6.244)	*minakuriwulaankiyarrngk*	CONT, DU
	COMP	(6.240)	*jaajaajuunth*	POT, COMP
COMP	(none)			

(6.239) NUMBER–CASE–A-TAM

Banki-wala-nurru-ya	*kurrumbu-uru-*	*kurdala-th-.*
panki-walaṯ-ɳuru-ki-a	kurumpu-kuɻu-ø	kuʈala-ṯa
lagoon-fPL-fASSOC-fLOC-T	fish spear-fPROP-T	spear-TH.T
lagoon-PL-ASSOC-INS-Ø	fish spear-PROP-Ø	spear-ACT

‘(People) speared (fish) with a fish spear, at places with lots of lagoons.’

[88] NEGATION is left aside here. It is always realised cumulatively with, or immediately before, TH-TAM.

(6.240) NUMBER–A-TAM–COMP; TH-TAM–COMP

Wida-walath-uu-ntha-	***jaa--jaa-j-uu-nth-.***
wita-palaṯ-kuu-in̪t̪a-ø	caː-c-caː-c-kuu-n̪ta-ø
hole-fPL-fPROP-fOBL-T	‹enter-TH-enter-TH›-fPROP-fOBL-T
hole-PL-FUT-COMP-Ø	‹fish into repeatedly›-POT-COMP-Ø

‘We will fish into to the holes.’

(6.241) NUMBER–COMP

Wirrka-j-uu-ntha	***dangka-walath-inj-.***
wirka-c-kuu-n̪ta-ø	t̪aŋka-palaṯ-in̪t̪a-ø
dance-fPROP-fOBL-T	man-fPL-fOBL-T
dance-POT-COMP-Ø	man-PL-COMP-Ø

(While they sing,) ‘the men will dance.’ [W1960]

(6.242) CASE–NUMBER–CASE

Maarra	***natha-rnurru-walath-i-na-***	*ngarn-d.*
maːra	ŋat̪a-ɳuru-walaṯ-ki-naa-ø	ŋaɳ-ta
all.T	camp-fASSOC-fPL-fLOC-fABL-T	beach-T
all	camp-ASSOC-PL-Ø-ABL-Ø	beach-Ø

‘Everyone from lots of places with camps was on the beach’ [R2005-jul12c]

(6.243) CASE–COMP

Dan-kurrka-	*birndi~birndi-nja-*	*rawalan-inja-*	***nguku-marra-nth-.***
t̪an-kurka-ø	piɳʈi-piɳʈi-ɲca-ø	ɻawalan-in̪t̪a-ø	ŋuku-mara-in̪t̪a-ø
here-fLOC.fOBL-T	‹shell$_{NL}$-shell$_{NL}$›-T	baler shell -T	water-fUTIL-fOBL-T
here-PRES.COMP-Ø	‹baler shell›-Ø	baler shell-Ø	water-UTIL-COMP-Ø

‘(See,) here’s a baler shell for (carrying) water.’ [R2005-jul06]

(6.244) CASE–TH-TAM–NUMBER

Nga-ku-l-da	*raa-j-uru-y-a*	*dathin-kiyarrng-ka*
ŋa-ku-l-ta	ɻaː-c-kuɻu-ki-a	ʈat̪in-kiarŋ-ka
1-2-pl-T	spear-TH-fPROP-fLOC-T	that-fDU-T
1-2-pl-ø	spear-Ø-POT-EMP-Ø	that-DU-Ø

Minakuri-wulaa--n-kiyarrng-k!
minakuɻi-wula-i-c-n-kiarŋ-ka
(place name)-‹fOABL-fMID›-TH-N-fDU-T
(place name)-‹SABL›-Ø-CONT-fDU-Ø
'We'll spear those two coming from Minakuri!' [R2005-jul08]

6.10.2 The apparent limit of inflectional complexity

One might expect, given a deeply enough embedded syntactic structure, for it to be possible for a Kayardild word within that structure to inflect for a truly prodigious number of morphosyntactic features. The greatest number attested though is just four. Evans (1995a: 114) mentions that attempts to elicit words or draw responses to suggested words with extreme amounts of inflection were unsuccessful. One significant observation here is that extreme inflection and the syntactic structures which would underlie it are both unattested in tandem — that is, it is not the case that after some point syntactic structures continue to increase in complexity while the morphology fails to keep pace,[89] rather syntactic structures whose corresponding morphological structure would be 'too complex' also fail to occur. Beyond this, the details are not particularly clear. Evans reports a limit of

[89] This alternate scenario is encountered in Old Georgian and Hurrian (Plank 1995:93). In Old Georgian and Hurrian a limited form of inflectional recursion occurs with respect to case marking, in which a word can inflect for no more than two case suffixes, even when the syntactic structures involved contain more than two layers of DP embedding.

four *case* suffixes (corresponding to the features treated here as CASE, A-TAM and COMP) but does not comment on other suffixes, and I have not been able to gather any further relevant data. In the absence of precise detail, no attempt will be made to incorporate any limit on morphological complexity into the account of Kayardild here, rather it will suffice to observe that the description and analysis introduced above does apply to all attested Kayardild forms.

6.11 Implications for prior formal treatments of Kayardild inflection

Since they were first presented in Evans (1985; 1995a), the facts of Kayardild inflection have received attention from a number of formal theorists, including Lieber (1992), Andrews (1996), Nordlinger (1998), Kracht (2002) and Sadler & Nordlinger (2006b). This section summarises the implications for these studies of the reanalysis and review of the facts of Kayardild presented in this chapter. With respect to those implications, the earlier studies mentioned above fall into two types.

Andrews (1996) and Nordlinger (1998) are both theoretical proposals within Lexical Functional Grammar (Kaplan & Bresnan 1982) regarding the nature of operations that build grammatical structures, and Kracht (2002) is a computational study of complex morphology within DPs; all three studies refer to Kayardild and provide partial analyses of its morphosyntax. For the arguments and findings of these studies, the reanalysis of Kayardild advanced here is largely benign. Although the reanalysis in this chapter calls for revisions of the details of the existing accounts, its implications for their fundamental approach are negligible, following from the fact that all three studies focus primarily on the relationship between multiple features marked on a single word and their formal association with clausal structures, or with information structures, of various sizes. The reanalysis of Kayardild in this chapter does not alter the basic observation, already present in Evans' (1985; 1995a) account of Kayardild, that multiple inflectional suffixes relate to grammatical domains of various sizes.

For Lieber (1992) and Sadler & Nordlinger (2006b), the reanalysis of Kayardild in this chapter does significantly alter the support for the formal account which Kayardild was identified as providing. Both studies focus primarily on the representation or realisation of multiple instances of the same feature (possibly with different values) which associate with one word. Under Evans' (1985; 1995a) analysis, Kayardild weighs upon such issues by virtue of its words which inflect with multiple *case* suffixes. These suffixes were characterised (1995a:118) as having identical realisations in all of their *functions*, whereas under the review and reanalysis presented here, (i) the multiple *case* features have for the most part been replaced with separate features (CASE, A-TAM, COMP); and (ii) it was shown that Evans' *case* morphemes do not in fact have identical realisations in their different *functions* (§6.2.4). For both Lieber (1992) and Sadler & Nordlinger (2006b) this entails that the words which were understood to associate with multiple instances of the same feature (*case*) are no longer viewed as such. On the other hand, it was argued in §6.10 inflectional recursion does exist in Kayardild. The consequences of this can be interpreted as follows.

Lieber (1992) argues for a specific, formal theory of morphosyntactic representations. Kayardild is cited in relation to the question of whether a language will always place a pre-determined, upper limit on the number of crucially layered (or ordered) features with which a word may associate (1992:94–97). Kayardild is deemed relevant insofar as only a finite number of *functions* of *case* exist. The conclusion is that even in a language as morphologically complex as Kayardild, yes, there is a limit. On the analysis of Kayardild developed in this chapter, the phenomenon of interest for Lieber's theory is not the multiplicity of *functions* of *case*, but recursion of the type discussed in §6.10; as was argued there, the evidence from Kayardild suggests that in fact the morphology does not place any limit on layering.

Sadler & Nordlinger (2006b) are concerned not with the representation, but with the realisation of multiple instances of features, and propose a revision to the realisational theory of Paradigm Functional Morphology (PFM, Stump 2001). Again, Kayardild is held to be significant to the extent that words may associate with multiple *case* features which, following Evans (1995a:118), are taken to exhibit identical realisations. The central argument is that the existence of languages such as Kayardild demands a recursive component in realisational architecture of PFM. Under the analysis of Kayardild advanced here, the evidence on which Sadler & Nordlinger base their argument is revised, and no longer supports their case — since, if different *functions* of *case* are not realised in precisely the same way, then they cannot be generated by just one, recursively applying component. However, other evidence relating to recursion was adduced in §6.10 which could occupy an equivalent place in a revised argument, whose conclusions would be the same as those of Sadler & Nordlinger (2006b), and valid.[90]

6.12 Chapter summary

Morphosyntactic features in Kayardild are regulated by a non-surface syntactic structure. Each feature attaches to an initial node and then percolates down to all lower nodes, and eventually to words. A central characteristic of the non-surface syntactic structure of Kayardild is the existence of multiple, layered S and VP nodes to which COMPLEMENTISATION and A-TAM features with particular values attach. Different positions of attachment for the various values of COMP and A-TAM translate into different distributions of those features' realisations within the sentence. The positions of DPs within the non-surface clause depend primarily on the semantic/grammatical role of the DP, but may depend also on the head N of NP. Among other things this ensures that juxtaposed DPs acquire similar or identical inflectional features independently of one another, without the need for any special or additional mechanism of agreement. Particles do not participate in non-surface syntactic structures, but are introduced directly into the surface syntactic structure as special clitics. As such, they are unable to acquire morphosyntactic features and so do not inflect. The alignment of particles with the edges of other surface syntactic constituents was analysed in terms of a grammar of ranked,

[90] In Ch.7, the realisation of the multiple tokens of the same features will be acheived via the use not of recurive rules as proposed by Sadler & Nordlinger (2006b), but of a fell-swoop constraint based architecture.

violable constraints. Although a full account of surface syntax is beyond the scope of this study, indications have been given of what such an account might involve and how it could complement and relate to both the non-surface and surface syntactic analyses advanced here. Finally, the inflectional system of Kayardild involves the recursion of morphosyntactic features, in that multiple tokens of the same feature may associate with a word. The linear order of the realisation of multiple feature tokens is sensitive to aspects of the syntactic structure to which the tokens relate. As such, the information which passes from the syntax to the realisational morphology of Kayardild will need to include a representation of ordering (or some similar relationship) among the various features associated with a word. Precisely how the information contained in morphosyntactic representations is then further spelt out into representations which can be realised by the phonology is the topic of the next chapter.

7 Realisational morphology

A central organising principle in analysis of Kayardild morphology and phonology in this dissertation has been the assumption, that between the morphosyntactic representation of a word and its underlying phonological representation there exists another, **morphomic** representation. As a shorthand, it will be convenient to label these three levels Σ (morphosyntactic), M (morphomic) and Φ (underlying phonological). Chapter 4 considered in detail the mapping between Φ and surface phonological forms, and Chapter 6 explored the mapping between syntactic structure *per se*, and Σ. This chapter, on the **realisational morphology** of Kayardild presents an analysis of the mappings between Σ and M, and between M and Φ.

The chapter is organised at follows. The general nature of the analysis, and issues involved in its formalisation are outlined in §7.1. Mappings from Σ to M are formalised in §7.2, and from M to Φ in §7.3. Some final observations regarding the architecture of Kayardild morphology and phonology are offered in §7.4.

7.1 Nature of the analysis

The empirical facts adduced in the preceding chapters support the general analysis adopted in the dissertation, that representations at the Σ and Φ levels are mediated by representations at the M level. It will be instructive to review the basic line of argumentation that stands behind this claim, taking the formal locative (fLOC) and formal oblique (fOBL) as our focus.

Recall from Ch.6, §6.2.1, that several different morphosyntactic features may be realised by the same 'morphome', such as fLOC or fOBL. These morphomes have certain realisations at the underlying phonological level: fLOC is realised as $_{\text{D/I}}$ki — i.e., segmental /ki/ with a stratal diacritic D/I, indicating that together with its preceding morph, it undergoes modifications according to the 'deleting' class of cluster reductions, and class I hiatus resolution; fLOC is realised as $_{\text{L/III}}$in̪t̪a after CV roots and is generally $_{\text{L/I}}$in̪t̪a elsewhere. As a first point then, if the M level were not posited, then realisational statements such as these just given would need to be repeated for multiple morphosyntactic feature values, with no explicit expression accorded to the fact that they are all identical. Two additional observations can provide further support for the positing of morphomes.

The fOBL morphome is subject to a strict constraint on its linear position within the word (Ch.6, §6.2.9): it must appear to the immediate left of the termination, T. Again, if no morphomic level of representation were posited, then this somewhat unusual realisational requirement would need to be independently stipulated for multiple morphosyntactic feature values.

Finally, the morphomic string fLOC+fOBL is realised not as ${}_{\text{D/I}}$ki+${}_{\text{L/I}}$iṉṯa, but by the suppletive and cumulative morph ${}_{\text{D}}$kurka. Without a morphomic level, the formal expression of this fact would require a statement ranging over every combination of a feature value normally realised as ${}_{\text{D/I}}$ki plus a feature value normally realised as +${}_{\text{L/I}}$iṉṯa.[1]

Clearly, relying upon Σ and Φ representations alone is unsatisfactory, but it might still be argued that alternatives analyses are available which avoid the positing of a morphomic level. One alternative approach would be to posit sub-classes of morphosyntactic features, and to define realisation rules with respect to these. The key problem with such an approach though, is that the sub-classes posited will fail to relate to any other dimension of organisation within the morphosyntactic feature system. A sub-class corresponding to fLOC for example would contain the heterogeneous members {CASE:locative, A-TAM:instantiated, A-TAM:present, TH-TAM:immediate, COMP:empathy}. It is precisely this species of independence from other the structure that exists within a morphosyntactic feature system which justifies the positing of a morphomic category (Aronoff 1994).

Another alternative approach would be to tolerate redundancies in the realisations of morphosyntactic feature values, and to express any similarities via redundancy rules. This approach might prove workable, if a theory of redundancy rules can be supplied. Since such a theory has not yet been developed, the prospects for this alternative are

[1] Alternatively, it would be possible to rely upon a 'readjustment rule', ${}_{\text{D/I}}$ki+${}_{\text{L/I}}$iṉṯa → ${}_{\text{D}}$kurka, however one then needs to account for the status of such a rule within the realisational system.

unclear, though one suspects that an analysis in such terms may well end up appearing very similar one which relies upon morphomic representations.[2]

On the basis of such considerations, it will be assumed throughout the remainder of the chapter that Σ level representations are realised first as M level representation, and only after that, as Φ level representations.

Before proceeding, a few words are needed regarding the nature of representations at the M level. The discussion immediately above focused on morphomic categories such as fLOC and fOBL, but representations at the M level may also contain other elements. To establish some terminology, let us refer to categories such as fLOC and fOBL as **primary morphomes**, or morphomes for short. In addition to primary morphomes are morphomic features. These include (i) stratal diacritics, which in some instances form part of the contrastive realisation of a given morphosyntactic feature value (Ch.6, §6.2.2); and (ii) the feature [±weak] which helps to regulate allomorphy. In the analysis below, each of these aspects of a morphomic representation will be referred to, sometimes *en bloc* (like when one refers to a whole phonological segment) and sometimes individually (like when one refers to specific features associated with a segment). With this said, let us now proceed to matters of formalisation.

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[2] It is beyond the scope of the chapter to pursue this idea any further, but the reader is invited to consider the extent to which the lexical correspondences presented in §§7.2.1, 7.3.1 below might function as analogues of redundancy rules.

7.1.1 Constraint types on mappings between Σ, M and Φ

In keeping with other parts of the dissertation, the approach taken here to mappings between the Σ, M and Φ levels will be formalised in terms of constraint based grammars. Despite sharing many similarities though, these grammars will depart from normal, phonological grammars in one significant respect related to the content of correspondences between elements in inputs and outputs. In phonological grammars, input–output correspondences typically hold between elements of the same type — i.e., between input and output features, input and output segments and so forth. Within the grammars which relate Σ and M representations, or M and Φ, correspondences will often hold between elements of dissimilar types, as listed in (7.1a,b).

(7.1)

	Correspondence type	Levels	Example
a.	morphosyntactic F:V :: morphome	Σ :: M	CASE:locative :: fLOC
b.	morphome :: morph	M :: Φ	fLOC :: /ki/

Under such circumstances, it will be assumed that constraints are of four basic types. Just as in phonological grammars, **markedness** constraints evaluate output representations entirely on their own terms. **Faithfulness** plays a reduce role, since relatively few aspects of an input ever find a direct, isomorphic reflection in the output. **Alignment** constraints will be permitted to refer both to output constituents, and to output constituents which realise a given input constituent. For example, the constraint ANCHOR(TH-TAM′,L,TH,R) requires the left edge of all realisations of TH-TAM to abut the right edge of a thematic, TH. The prime notation, e.g. e′, will be used to denote the output element which realises input element e. Finally, the analysis relies crucially upon a mechanism which I will term

Lexical Grounding. In many ways Lexical Grounding serves as the constraint-based grammar's answer to the **realisation rules** which occupy a central place in many rule-based theories of morphological realisation.

7.1.2 Lexical Grounding

This section sets out the mechanics of an approach to morphological realisation in constraint based grammar which I term Lexical Grounding. It takes its impetus from approaches to phonologically conditioned allomorphy introduced in Ch.4, §4.5, and from rule based, realisational theories of morphology such as A-Morphous Morphology (Anderson 1992) and Paradigm Function Morphology (Stump 2001).

Lexical Grounding is predicated on two main elements: (i) a **lexicon** of correspondences between input and output elements at two distinct representational levels, *J* and *K*; and (ii) a family of violable LEXICALGROUNDING constraints, to be introduced below.

The lexicon pertaining to a pair of levels *JK* contains a list of input–output correspondences such as those shown in the rightmost column of (7.1) above. Although these correspondences are not rules in a classic sense, they can be understood as encapsulating the same *content* as realisation rules in rule-based theories, but without the backing of a transformational component that actually applies that content to a representation. In lexical grounding, the content of the lexicon is brought to bear on the derivation of representations within the constraint based grammar. At this abstract level, lexical grounding is therefore comparable to several other approaches to constraint based morphological realisation, which can be mentioned now.

A significant approach in OT to morphological realisation is the deployment of **realisational constraints** (Kager 1996; Yip 1998; MacBride 2004; Xu 2007). These are prototypically of the type '$a_J \rightarrow a'_K$', demanding that representation *a* on level J correspond to representation *a′* on level K. A noteworthy feature of this formalism is that it stipulates a realisation for the input, *a*, in all-or-nothing terms: the realisational constraint will equally penalise any deviation of *a*'s output correspondent from the required form, *a′*. If control needs to be exercised over a range of permissible realisations for *a*, then multiple realisational constraints will be required (MacBride 2004).

In recent work within harmonically serial OT, Wolf (2008) makes use of an external 'lexicon' of correspondences afforded by the **lexical insertion** rules of Distributed Morphology (DM; Halle & Marantz 1993; 1994). In DM, abstract morphological elements are passed from the morphological component to the phonology within a tree-like structure that provides information pertinent to linearisation; those abstract elements are then provided with phonological content by lexical insertion rules. Wolf (2008) incorporates this DM notion into a theory of harmonically serial OT. Recall from Ch.4, §4.1.2 that in harmonically serial OT, output candidates are permitted to vary only minimally from their inputs, and that the winning candidate from one evaluation cycle of a grammar is fed back into the same grammar as the input for the subsequent cycle; this process reiterates until such time as the output of a cycle is identical to the input, at which point the derivation is complete. Wolf proposes that lexical insertion — the provision of an abstract morphological element with phonological content — may count as one of the permitted, 'minimal variations' which may distinguish output candidates from inputs.

In this chapter, the constraint-based grammars used are of a standard, non-serial type. Without further ado, let us now introduce the constraint family LEXICALGROUNDING, abbreviated below as LEX.[3]

In a grammar that maps level *J* inputs onto level *K* outputs, a constraint LEX-*JK* evaluates candidates by taking each input element *a* and scanning the *JK* lexicon for correspondences of the form *a* :: *x′* for all outputs *x′*. It then compares the actual output correspondent of *a*, which we can call *a′*, with the outputs *x′* in the lexicon, and demands that *a′* match at least one of these *x′* outputs in some certain way. By ranking LEX-*JK* appropriately, the output correspondent for *a* will be constrained, at least partly, by what is in the lexicon. The definition of a basic LEX-*JK* constraint is presented in (7.2), and a parameterised version in (7.3).

[3] Constraints which share some similarities with LEXICALGROUNDING have been suggested previously. Kie (2000) proposes a constraint USELISTED which demands that the input–output correspondences of an entire word conform to a listing in the lexicon. Wolf (2008) proposes MAX-M(FS)$_{listed}$ which is similar in effect to unparameterised LEX, and demands that a mapping between input 'features structures' (FS) and the output surface form of a morpheme conform to a listing in the lexicon. Steriade's theory of Lexical Conservatism (1999b) aims to account for the phonological form of neologisms and also relies upon a 'LEX' constraint to ensure that the surface form of a morpheme in a neologism conforms to one of its surface forms listed in the lexicon. In contrast to these previous proposals though, LEXICALGROUNDING is not specifically directed towards regulating surface forms, rather it is a more general constraint used for any mapping between a pair of representational levels whose characteristic elements are not of the same kind.

(7.2) LEX-ΣM ‘no unlicensed mappings’
For a corresponding input–output element pair *a* and *a′* (at levels Σ and M), the mapping *a*→*a′* is present in the lexicon.

(7.3) LEX(fα)-ΣM ‘no unlicensed mappings, wrt. primary morphome’
For a corresponding input–output element pair *a* and *a′* (at levels Σ and M), a mapping *a*→*x′* is present in the lexicon, where *a′* and *x′* share their primary morphome.

An important difference between the Lexical Grounding approach taken here and the alternative constraint based approaches to morphological realisation introduced above, is that even if the lexicon provides only one correspondence, *a* :: *a′*, for an input *a*, it is not the case that *a* must always be realised as output *a*′, rather other constraints in the grammar, particularly markedness constraints, can cause the realisation of *a* in a winning candidate to *resemble* the output *a′* provided by the lexicon, but nevertheless depart from it in some respects. Consider the simplified example of an input morphosyntactic feature {A-TAM:future}. Its sole correspondence in the ΣM lexicon is shown here in (7.4). In song, [+wk] morphomes are not permitted. Tableau (7.5) illustrates the derivation.

(7.4)

A-TAM:fut :: fPROP[+wk]

(7.5)

	{A-TAM:fut} (in song)	*[+wk] /SONG	LEX(fα)	LEX
☞	fPROP[−wk]			1
a.	fPROP[+wk]	W_1		L
b.	fASSOC		W_1	1

Losing candidate (7.5a) fails because it contains the [+wk] feature and so violates the markedness constraint *[+wk]/SONG. Loser (7.5b) violates LEX(fα) because lexicon (7.4) contains no entry in which A-TAM:fut corresponds to a representation whose primary morphome is fASSOC. The winning candidate is the most harmonic, even though it violates LEX — and it does so because lexicon (7.4) does not contain a correspondence 'A-TAM:fut :: fPROP[–wk]'.

Let us move next to the possibilities afforded by enriching the lexicon beyond just one correspondence per input element. If multiple correspondences for a given input appear in the lexicon, then when LEX compares them against an actual pair of input–output elements in a candidate, it will be satisfied if a match is found with any of them. This will enable LEX to equally favour candidates, whose input–output relationships reflect any of a number of correspondences in the lexicon. Which of these candidates wins will then need to be determined by other factors. The end result is noticeably similar to the kind of allomorph selection we saw in Ch.4, §4.5. A short, abstract example will illustrate this.

Suppose that the lexicon we are interested in contains the correspondences shown in (7.6), and that the grammar contains the constraints shown in tableau (7.7); our input is *a*+*b*. Subscripted indices are displayed on input and output elements to indicate their correspondences to one another.

(7.6)

a :: x	*a* :: y	*b* :: z

(7.7)

	a_1+b_2	LEX	*yz
☞	x_1+z_2		
a.	y_1+z_2		W_1
b.	y_1+q_2	W_1	

In (7.7), the winning candidate satisfies LEX, based on the correspondences *a*::x and *b*::z, and it satisfies the markedness constraint *yz. Losing candidate (7.7a) satisfies LEX based on the correspondences *a*::y and *b*::z, but it violates *yz. Loser (7.7b) fails to satisfy LEX, by virtue of containing the input–output correspondence *b*::q.

To complete the parallels with the methods used to analyse allomorph selection in Ch.4, it will be assumed here that a lexicon which contains more than one correspondence for an input *a*, marks one such correspondence as preferred — a carat '^' will be used to indicate this. A LEXICALPRIORITY constraint then refers only to the preferred correspondence in its comparisons:

(7.8) LEXPRIOR 'no non-preferred mappings'
For a corresponding input–output element pair *a* and *a′*, the mapping *a*→*a′* is present in the lexicon and is the preferred correspondence for *a*.

An example is shown in (7.9) and (7.10). Here, the only distinction between the winning candidate and loser (7.10) is that the loser violates LEXPRIOR, because the correspondence *a*::y, while listed in the lexicon, is not the preferred correspondence.

(7.9)

^*a* :: x	*b* :: z	*c* :: q
a :: y		

(7.10)

	a_1+c_2	LEX	*yz	LEXPRIOR
☞	x_1+q_2			
a.	y_1+q_2			W_1
b.	x_1+z_2	W_1		

With the LEXICALGROUNDING and LEXICALPRIORITY formalism in hand, we review some additional, basic constraint types before turning to the analysis of the Kayardild data.

7.1.3 Basic inventory of ΣM and MΦ constraints

The mappings from Σ→M and M→Φ will be analysed here in terms of one constraint based grammar each. As mentioned earlier, constraints will include markedness constraints, faithfulness constraints, Lexical Grounding constraints and alignment and anchoring constraints.

Markedness constraints function in a familiar way. Examples of those used below include *fLOC (7.11) and *[–wk]/SONG (7.12).

(7.11) *fLOC
The output (at level M) does not contain fLOC.

(7.12) *[–wk]/SONG
An output (at level M) in song does not contain a [–wk] morphome.

An important set of constraints will be those which regulate linear order. To this end, ANCHOR and ALIGN constraints will be used in a standard fashion, although clarification is required regarding one point of representation. Some Σ level feature values are realised not just by a single morphome but by a string of morphomes at the M level — for example, TH-TAM:antecedent is realised by the string fN+fCONS. An ANCHOR or ALIGN constraint which refers to a feature's realisation will refer to the whole string, not to each individual element in the string, so that for example, if fN+fCONS realises TH-TAM:ante in the string TH+fN+fCONS, then the realisation of TH-TAM:ante is considered to be completely aligned with the TH on its left, even though the individual morphome fCONS is not adjacent to it.

In addition to ANCHOR and ALIGN constraints, linear order will also be regulated by the faithfulness constraints LINEARITY (7.13) and NONSEQUENTIALITY (7.14).

(7.13) LIN-ΣM 'no metathesis'
For two elements *a,b* in Σ such that *a* linearly precedes *b*, and the elements *a′,b′* in M, where *a* corresponds to *a′* and *b* to *b′*, *b′* does not precede *a′*.

(7.14) NONSEQ-ΣM 'no additional linear ordering'
For two elements *a,b* in Σ which are *not* ordered with respect to one another, and the elements *a′,b′* in M, where *a* corresponds to *a′* and *b* to *b′*, *a′* and *b′* are also linearly unordered with respect to one another.

LIN is a standard correspondence constraint (McCarthy & Prince 1999) which penalises the metathesis of elements which are ordered in an input, though it does not penalise cumulative exponence. The constraint NONSEQ-ΣM is introduced here specifically to deal with mappings between unordered morphosyntactic features and linearised morphomes. Specifically, NONSEQ will militate against a pair of mutually unordered feature values being realised by separate morphs.

Other basic faithfulness constraints include MAX-ΣM (7.15) and DEP-ΣM (7.16).

(7.15) MAX-ΣM 'realise features'
An element in the Σ-level input has a correspondent in the M-level output.

(7.16) DEP-ΣM 'no vacuous morphomes'
An element in the M-level output has a correspondent in the Σ-level input.

7.2 Σ→M grammar

We turn now to the Σ→M grammar, and begin with some aspects of the mapping it produces, which will be held constant throughout the subsections to follow. Tableau (7.17) shows the derivation between levels Σ and M of *wurankabanda* ‘hunter (lit., food finder)’, a word consisting of a complex stem which is not inflected for any positive morphosyntactic features. Displayed at the top left of the tableau are the level of the input (Σ), the lexical index WURANKABAN, and the (empty) set of morphosyntactic features, {}. Supplementary information about the lexical stem WURANKABAN is displayed beneath the tableau. Candidate outputs are all at the morphomic (M) level of representation.

(7.17)

	Σ: WURANKABAN; {}	LEXSTEM-ΣM	L-ANCHOR (ω,STEM)	R-ANCHOR (ω,T)	R-ANCHOR (T,ω)	DEP-ΣM	MAX-ΣM
☞	M: *wuran*+$_{\text{R}}$*kaba*+TH+fN+T					1	
a.	M: *wuran*+$_{\text{R}}$*kaba*+TH+fN			W_1		L	
b.	M: T+*wuran*+$_{\text{R}}$*kaba*+TH+fN		W_1	W_1		1	
c.	M: *wuran*+$_{\text{R}}$*kaba*+TH+T+fN	W_1			W_1	1	
d.	M: *wuran*+ T	W_1				1	
e.	M: T		W_1			1	

WURANKABAN ‘hunter’ → *wuran*+*kaba*+TH+fN

Both in (7.17) and throughout the chapter, a cover constraint LEXSTEM-ΣM ensures that a lexical stem is incorporated into a word form in accordance with its representation in the lexicon (cf Ch.3, §3.2) and that it is not changed in any way, including having its component parts altered, deleted, rearranged or split apart from one another. The constraint L-ANCHOR(ω,STEM) ensures that a stem appears at the left edge of a word, and the constraints R-ANCHOR(ω,T) and R-ANCHOR(T,ω) ensure that every word ends with the termination T, and that T only appears at the end of a word. (The evaluation of DEP-ΣM is discussed shortly below.)

Tableau (7.18) shows the Σ→M derivation of *danurruwa* 'here-ASSOC-T'. This time, the lexical stem is inflected for the feature value set {CASE:assocaitive}. Inflectional elements in the input are displayed along with an index, in order to keep track of their correspondents in each output candidate. Thus in (7.18), CASE:assoc carries the index 1, placed as a subscript to the right. Individual output candidates may or may not contain a correspondent of this input element; if they do, it will also be subscripted as 1. Elements in the output which do not correspond to input elements will also carry their own index. The input–output correspondence relationships between elements in the stem are not displayed.

(7.18)

	Σ: DAN; {CASE:assoc$_1$}	LEXSTEM-ΣM	L-ANCHOR (ω,STEM)	R-ANCHOR (ω,T)	R-ANCHOR (T,ω)	DEP-ΣM	MAX-ΣM	LEX-ΣM
☞	M: *dan*+fASSOC$_1$+T$_2$					$_1$		
a.	M: *dan*+fASSOC$_1$+fLOC$_2$+T$_3$					W$_2$		
b.	M: *dan*+fASSOC$_2$+T$_3$					W$_2$	W$_1$	
c.	M: *dan*+T$_2$					$_1$	W$_1$	
d.	M: *dan*+fPROP$_1$+T$_2$					$_1$		W$_1$
e.	M: *dan* +T$_2$+fASSOC$_1$+T$_3$				W$_1$	W$_2$		
f.	M: *dan*+fASSOC$_1$			W$_1$		L		

DAN 'here' → *dan*

A few basic issues are illustrated by tableau (7.18). The constraint DEP-ΣM militates against output morphomes with no input correspondent. The termination T is one such morphome, and its presence incurs a violation of DEP-ΣM. Nevertheless, because DEP-ΣM is outranked by R-ANCHOR(ω,T), the termination will always appear at the end of a word, even at the cost of that violation. On the other hand, other gratuitous morphomes will not. Losing candidate (7.18a) for example contains a gratuitous fLOC, and so critically violates DEP-ΣM. Loser (7.18b) has the same morphomic content as the winner, but its fASSOC morphome is not in correspondence with the input CASE:assoc feature value, thus since CASE:assoc has no output correspondent, and fASSOC no input correspondent, both MAX-ΣM and DEP-ΣM incur extra violations. Finally, in (7.18d), input CASE:assoc stands in correspondence with output fPROP, and thus the candidate violates LEX-ΣM by virtue of the fact that the correspondence 'CASE:assoc :: fPROP' is not listed in the lexicon.

To save space below, stems will often be shown simply as 'S', and the undominated constraints LEXSTEM, L-ANCHOR(ω,STEM), R-ANCHOR(ω,T) and R-ANCHOR(T,ω) will generally not be shown; it will be assumed that these constraints are satisfied, and only candidates which satisfy them will be displayed in tableaux.

7.2.1 The ΣM lexicon

The lexicon for Σ→M correspondences in given in (7.19). Correspondences are organised by morphosyntactic features, which listed at the far left, and value, given to the left of the each arrow '→' in the bulk of the table. At the M level, some morphomes will already be assigned stratal diacritics (though most will not), and some will carry a [±wk] feature. For each (output) morphome represented in (7.19), at least one correspondence will appear in the MΦ lexicon in §7.3.1 below.

(7.19) Lexicon of Σ→M correspondences

CASE	^ablative :: fABL[+wk]	dative :: fDAT-TH
	ablative :: fABL[−wk]	donative :: $_{\text{R}}$fDON-TH^{c}
	allative :: fALL	human allative :: fHALL-TH^{c}
	associative :: fASSOC	collative :: fLLOC-fINCH-TH
	consequential :: $_{\text{R}}$fCONS[−wk]	objective ablative :: fOABL-TH
	denizen :: fDEN-TH^{c}-N	objective evitative :: fOEVIT-TH
	genitive :: fGEN	purposive :: fHALL-$_{\text{III}}$fMID-TH^{c}
	instrumental :: fINST	subj. ablative :: fOABL-$_{\text{III}}$fMID-TH^{c}
	locative :: fLOC	subj. evitative :: fOEVIT-$_{\text{IV}}$fMID-TH^{c}
	oblique :: fOBL	translative :: fDAT-$_{\text{V}}$fMID-TH^{c}
	origin :: fORIG	
	privative :: $_{\text{R}}$fPRIV	
	^proprietive :: fPROP[+wk]	
	proprietive :: fPROP[−wk]	
	utilitive :: fUTIL	
NUM	dual :: fDU	plural :: fPL
A-TAM	antecedent :: $_{\text{R}}$fCONS[−wk]	negatory :: $_{\text{R}}$fPRIV
	continuous :: fOBL	precondition :: fABL[−wk]
	directed :: fALL	present :: fLOC
	emotive :: fOBL	prior :: fABL[+wk]
	future :: fPROP[+wk]	functional :: fUTIL
	instantiated :: fLOC	
NEG	+NEG :: fNEG	
TH-TAM	actual (not realised)	imperative (not realised)
	antecedent :: fN-$_{\text{R}}$fCONS[−wk]	past :: $_{\text{D}}$fCONS[+wk]
	apprehensive :: fAPPR	potential :: fPROP[+wk]
	desiderative :: fDES	precondition :: fCONS[−wk]
	directed :: fALL	progressive :: fN
	hortative :: fOBL	resultative :: fRES
	immediate :: fLOC	nonveridical :: fN-fPRIV
COMP	empathy :: fLOC	plain :: fOBL
NEG& TH-TAM	{+NEG, TH-TAM:actual} :: $_{\text{D}}$fPRIV	
	{+NEG, TH-TAM:imperative} :: fNEG	

7.2.2 Preservation of linear order from Σ to M

The mechanism of feature percolation (see Ch.6, §6.7) provides each word with a feature structure containing morphosyntactic feature values which for the most part are ordered with respect to one another. In the general case, that ordering is projected from Σ to M. In the present analysis, this is effected via the constraint LIN(EARITY)-ΣM, defined in (7.13) above. Tableau (7.20) shows the Σ→M derivation of the word *makurnurruwalada* 'woman-ASSOC-PL'. In the winning candidate, the pair-wise ordering between the input elements CASE:assoc and NUM:pl is maintained between their output correspondents; in loser (7.20a) it is not, and so LIN-ΣM is violated.

(7.20)

	Σ: MAKU; {CASE:assoc$_1$ > NUM:pl$_2$}	DEP-ΣM	MAX-ΣM	LIN-ΣM
☞	M: *maku*+fASSOC$_1$+fPL$_2$+T$_3$	1		
a.	M: *maku*+fPL$_2$+fASSOC$_1$+T$_3$	1		W$_1$

MAKU 'woman' → *maku*

7.2.3 Realisations of A-TAM, TH-TAM and NEG

The most complicated aspect of the Σ→M grammar is the realisation of A-TAM, TH-TAM and NEG. These three features, if associated with the same clause in the syntax, will have been placed into a feature structure by feature percolation in such a manner that they are unordered with respect to one another. Although unordered TH-TAM and NEG features can both be overtly realised in a single word form, neither can be realised together with a mutually unordered A-TAM feature — that is, A-TAM features on the one hand and TH-TAM/NEG features on the other, which are associated with the same syntactic clause are not realised on the same word (Ch.6, §§6.2.5–6.2.6). By the same token, words can and do inflect for both A-TAM and TH-TAM/NEG features associated in the syntax with different clauses; feature percolation places features from different clauses into a feature structures in such a manner that they *are* ordered with respect to one another.

7.2.3.1 Incompatibilities in the realisation of A-TAM versus TH-TAM and NEG

Feature percolation leaves A-TAM and TH-TAM/NEG features associated with the same clause unordered with respect to one another, within a word's feature structure. We can begin by considering just A-TAM and TH-TAM. Most clauses do not associate with a NEG feature, and so most feature structures contain A-TAM and TH-TAM without NEG.

Within the ΣM lexicon there are no correspondences of the type '*ab* :: *c*' where *a* is an A-TAM feature value, *b* a TH-TAM feature value and *c* a single morpheme and thus, it will be impossible to map from an A-TAM/TH-TAM pair to a single morpheme without violating LEX(fα). In addition, it is impossible to map from the unordered A-TAM and TH-TAM feature values to two ordered morphemes without violating NONSEQ(A-TAM), defined in (7.21).

(7.21) NONSEQ(A-TAM) 'no additional ordering of A-TAM'
For two elements *a,b* in Σ, which are *not* ordered with respect to one another, and of which one is an A-TAM feature, and elements *a′,b′* in M, where *a* corresponds to *a′* and *b* to *b′*, *a′* and *b′* are also linearly unordered with respect to one another.

If LEX(fα) and NONSEQ(A-TAM) outrank MAX-ΣM, then the most harmonic output candidate will be one which respects both LEX(fα) and NONSEQ-ΣM, but not MAX-ΣM — a candidate which realises just one of the two, unordered A-TAM and TH-TAM features.

Which feature is realised depends on what appears to the immediate left of the that realisation. Specifically, TH-TAM appears after the thematic TH, and A-TAM otherwise (Ch.6, §6.2.5). This will be captured by the ranking shown in (7.22).

(7.22) || DEP-ΣM, LEX(fα), NONSEQ(A-TAM) » MAX(TAM)
» *TH+A-TAM′ » TH-TAM′/TH_ » MAX-ΣM » LIN-ΣM ||

(7.23) MAX(TAM) ‘realise TH-TAM and A-TAM features’
A cover constraint for MAX(A-TAM) and MAX(TH-TAM).

(7.24) *TH+A-TAM′
The output (at the M level) does not contain TH followed immediately by the realisation of an A-TAM feature.

(7.25) TH-TAM′/TH_ = ANCHOR(TH-TAM′,L,TH,R)
Any realisation of a TH-TAM feature is adjacent to a TH morphome to its left.

The first and last two constraints in (7.22) essentially enforce a ‘business as usual’ regime, ensuring that no quirky solutions (such as rearranging the order of morphomes, inserting meaningless morphomes, or leaving other features in the word unrealised) are resorted to in order to get A-TAM and TH-TAM realised. The constraint *TH+A-TAM′ ensures that the realisation of A-TAM cannot follow TH. A tableau corresponding to *kalanharra* ‘cut-APPR-T’, which inflects for TH-TAM:apprehensive and not A-TAM:emotive, is shown in (7.26).

(7.26)

Σ: KALATH; {A-TAM:emo_1, TH-TAM:$appr_2$}	DEP-ΣM	LEX(fα)	NONSEQ (A-TAM)	MAX(TAM)	*TH+A-TAM′	TH-TAM′/TH_	LIN-ΣM
☞ M: *kala*+TH+f$APPR_2$+T_3	1			1			
a. M: *kala*+TH+fOBL_1+T_3	1			1	W_1		
b. M: *kala*+TH+f$APPR_2$+fOBL_1+T_3	1		W_1	L			
c. M: *kala*+TH+f$PROP_3$+fOBL_1+T_4	W_2			1			
d. M: *kala*+TH+f$APPR_{1,2}$+T_3	1	W_1		L	W_1		

KALATH → *kala*+TH

Losing candidate (7.26a) realises A-TAM rather than TH-TAM straight after TH, and so violates *TH+A-TAM′. Loser (7.26b) realises both features, in violation of NONSEQ(A-TAM); loser (7.26c) inserts a meaningless morphome between TH and the realisation of A-TAM, avoiding a violation of *TH+A-TAM′ but incurring an extra violation of DEP-ΣM; loser (7.26d) realises both features through the same morphome, but since such a correspondence is not attested in the lexicon, it violates LEX(fα).

A similar example is shown in (7.27). This time, the thematic TH appears at the end of a thematic CASE suffix. In (7.27), the lexical stem is abbreviated to S.

(7.27) Σ: S; {CASE:dat$_1$ > A-TAM:emo$_2$, TH-TAM:appr$_3$}	DEP-ΣM	LEX(fα)	NONSEQ (A-TAM)	MAX(TAM)	*TH+A-TAM′	TH-TAM′/TH_	MAX-ΣM	LIN-ΣM
☞ M: S+fDAT$_1$+TH$_1$+fAPPR$_3$+T$_4$	1			1				
a. M: S+fDAT$_1$+TH$_1$+fOBL$_2$+T$_4$	1			1	W$_1$			
b. M: S+fDAT$_1$+TH$_1$+fAPPR$_3$+fOBL$_2$+T$_4$	1		W$_1$	L				
c. M: S+fOBL$_2$+fDAT$_1$+TH$_1$+fAPPR$_3$+T$_4$	1		W$_1$	L				W$_1$
d. M: S+fOBL$_2$+T$_4$	1			1			W$_1$	
e. M: S+fDAT$_1$+fOBL$_2$+T$_4$	1	W$_1$		L				

Most losing candidates in (7.27) fail for reasons similar to losers in (7.26) above. Losing candidate (7.27d) is novel: it avoids violating *TH+A-TAM′ by deleting the CASE suffix, but in so doing incurs an extra, critical violation of MAX-ΣM.

Having considered the inflection of stems ending in the thematic TH, we turn next to a stem which does not end in TH. A tableau corresponding to *birrkinja* 'string-EMO-T', which inflects for A-TAM:emotive and not TH-TAM:apprehensive, is shown in (7.28). Note that the input feature structures are identical in (7.26), and (7.28); we are merely varying the form of the material to the left of the realised feature value.

(7.28) Σ: BIRRK; {A-TAM:emo$_1$, TH-TAM:appr$_2$}	DEP-ΣM	LEX(fα)	NONSEQ (A-TAM)	MAX(TAM)	*TH+A-TAM′	TH-TAM′/TH_	LIN-ΣM
☞ M: *birrk*+fOBL$_1$+T$_3$	1			1			
a. M: *birrk*+fAPPR$_2$+fOBL$_1$+T$_3$	1		W$_1$	L		W$_1$	
b. M: *birrk*+fAPPR$_2$+T$_3$	1			1		W$_1$	
c. M: *birrk*+TH$_3$+fAPPR$_2$+T$_4$	W$_2$			1			
d. M: *birrk*+T$_3$	1			W$_2$			

Loser (7.28a) realises both features and so violates NONSEQ(A-TAM). Losers (7.28a,b) realise TH-TAM yet fail to place the realisation of TH-TAM to the left of a TH morphome, so violate TH-TAM′/TH_. Loser (7.28c) inserts an empty TH morphome and falls foul of DEP-ΣM; loser (7.28c) fails to realise either feature and so violates MAX(TAM) twice.

We can now bring the feature NEG back into our account. Let us first review the morphosyntactic and realisational facts. If a clause is associated with a +NEG feature value, then in a word's feature structure that value will be unordered, along with the A-TAM and TH-TAM feature values in the same clause. In terms of word forms, the realisation of +NEG appears directly after a thematic TH, and is followed by the realisation of TH-TAM. These facts can be incorporated into the analysis by ranking NEG′/TH_ just above MAX(TAM):

(7.29) NEG′/TH_ = ANCHOR(+NEG′,L,TH,R)

Importantly, it is perfectly fine for both NEG and TH-TAM to surface together in different morphomes, even though the features themselves are unordered in the input — this is why the parameterised constraint NONSEQ(A-TAM) has been used (which focuses its attention on A-TAM), rather than the basic constraint NONSEQ-ΣM (which would apply equally to all unordered features).

Example tableaux are shown now in (7.30) and (7.31), corresponding to the words *kalanangku* 'cut-NEG-POT-T' which inflects for +NEG and TH-TAM:potential but not A-TAM:future, and *birrku* 'string-FUT-T' which inflects for A-TAM:future but not+NEG and TH-TAM:potential.

(7.30)

Σ: KALATH; {A-TAM:fut$_1$, +NEG$_2$, TH-TAM:pot$_3$}	DEP-ΣM	NONSEQ (A-TAM)	NEG′/TH_	MAX(TAM)	*TH+A-TAM′	TH-TAM′/TH_
☞ M: *kala*+TH+fNEG$_2$+fPROP[+wk]$_3$+T$_4$	1			1		1
a. M: *kala*+TH+fPROP[+wk]$_3$+fNEG$_2$+T$_4$	1		W$_1$			L
b. M: *kala*+TH+fNEG$_2$+fPROP[+wk]$_3$ +fPROP[+wk]$_1$+T$_4$	1	W$_1$		L		1
c. M: *kala*+TH+fPROP[+wk]$_1$+T$_4$	1			1	W$_1$	L

In (7.30), losing candidate (7.30a) contains the same morphs as the winner, but the realisations of +NEG and TH-TAM are the opposite order, incurring a critical violation of NEG′/TH_. As usual, a candidate which realises all features (7.30b) violates NONSEQ(A-TAM), as would other candidates (not shown) which realise A-TAM together with either of NEG or TH-TAM. Loser (7.30c) realises just A-TAM and so violates *TH+A-TAM′.

(7.31)

Σ: BIRRK; {A-TAM:fut$_1$, +NEG$_2$, TH-TAM:pot$_3$}	DEP-ΣM	NONSEQ (A-TAM)	NEG′/TH_	MAX(TAM)	*TH+A-TAM′	TH-TAM′/TH_
☞ M: *birrk*+fPROP[+wk]$_1$+T$_4$	1			1		
a. M: *birrk*+fPROP[+wk]$_1$+fNEG$_2$ +fPROP[+wk]$_3$+T$_4$	1	W$_1$	W$_1$	L		W$_1$
b. M: *birrk*+fNEG$_2$+fPROP[+wk]$_3$+T$_4$	1		W$_1$	L$_1$		W$_1$
c. M: *birrk*+TH+fNEG$_2$ +fPROP[+wk]$_3$+T$_4$	W$_2$			L$_1$		W$_1$
d. M: *birrk*+fPROP[+wk]$_3$+T$_4$	1			1		W$_1$

The winning candidate in (7.31) realises just A-TAM. Loser (7.31a) fails, as usual by virtue of realising all features at once and hence violating NONSEQ(A-TAM), just as other candidates (not shown) would, which realise A-TAM together with either of NEG or TH-TAM. Losing candidate (7.31b) realises NEG, but not adjacent to TH, and so violates NEG′/TH_. Loser (7.31c) avoids that problem by inserting TH, but violates DEP-ΣM in doing so. Finally, loser (7.31d) realises just TH-TAM. It realises the same number of features as the winner, but critically violates TH-TAM′/TH_.

We have not yet examined words with feature structures in which A-TAM, TH-TAM and NEG *are* ordered, by virtue of being associated with separate (and embedded) clauses in the syntax. We conclude this section by examining the realisation of one such word. Tableau (7.32) shows the derivation of *diyanngarrbawu* 'eat-ANTE-FUT-T', a verb in an embedded clause (see examples (6.76/6.77), Ch.6). Note that the correspondence for TH-TAM:antecedent is 'TH-TAM:ante :: fN-fCONS' — it is realised by two, adjacent morphomes.

(7.32) Σ: DIYAJ; {A-TAM:ante$_1$, TH-TAM:ante$_2$ > A-TAM:fut$_3$, TH-TAM:pot$_4$}	DEP-ΣM	NONSEQ (A-TAM)	NEG′/TH_	MAX(TAM)	*TH+A-TAM′	TH-TAM′/TH_	LIN-ΣM
☞ M: *diya*+TH^c+fN$_2$+$_R$fCONS[−wk]$_2$ +fPROP[+wk]$_3$+T$_5$	1			2			
a. M: *diya*+TH^c+fN$_2$+$_R$fCONS[−wk]$_2$ +$_R$fcons[−wk]$_1$+fPROP[+wk]$_3$+T$_5$	1	W$_1$		L$_1$			
b. M: *diya*+TH^c+fN$_2$+$_R$fCONS[−wk]$_2$ +fPROP[+wk]$_3$+fPROP[+wk]$_4$+T$_5$	1	W$_1$		L$_1$		W$_1$	
c. M: *diya*+TH^c+fN$_2$+$_R$fCONS[−wk]$_2$ +fPROP[+wk]$_4$+T$_5$	1		W$_1$	2		W$_1$	
d. M: *diya*+TH^c+$_R$fCONS[−wk]$_1$ +fPROP[+wk]$_3$+T$_5$	1			2	W$_1$		
e. M: *diya*+TH^c+fPROP[+wk]$_4$+T$_4$	1			W$_3$			
f. M: *diya*+TH^c+fPROP[+wk]$_4$ +$_R$fcons[−wk]$_1$+T$_4$	1			2			W$_1$

DIYAJ → *diya*-TH^c

The winning candidate in (7.32) realises the TH-TAM:ante feature of the embedded clause directly to the right of TH, plus the A-TAM:fut feature of the matrix clause. Losing candidates (7.32a–e) lose for reasons which are now familiar, but loser (7.32f) is novel. Like the winner, candidate (7.32f) realises a TH-TAM feature directly to the right of TH, plus an A-TAM feature after it, only in (7.32f) the order of the morphomes in the output contradicts the order in the input, and therefore incurs a critical violation of LIN-ΣM.

In the sections to follow, issues surrounding the realisation of A-TAM, TH-TAM and NEG are backgrounded in order to focus on other topics; examples will often contain unordered A-TAM, TH-TAM and NEG features of which at least one goes unrealised for the reasons that have just been discussed.

7.2.3.2 Null and cumulative exponence of TH-TAM*:actual and* TH-TAM*:imperative*

In the Σ→M lexicon, the feature values TH-TAM:actual and TH-TAM:actual do not appear in any simple correspondence *a::b*. As a consequence they generally receive no overt realisation. As tableau (7.33) shows, candidates which would provide TH-TAM:actual with an overt realisation fail.

(7.33)

	Σ: KALATH; {A-TAM:ins, TH-TAM:act$_1$}	LEX(fα)	MAX-ΣM
☞	M: *kala*+TH+T$_2$		1
a.	M: *kala*+TH+fPROP$_1$+T$_2$	W$_1$	L
b.	M: *kala*+TH+T$_{1,2}$	W$_1$	L

Losing candidate (7.33a) realises TH-TAM:act as fPROP, but violates LEX(fα) in doing so. Loser (7.33b) realises TH-TAM:act cumulatively with T, but again violates LEX(fα). The analysis for TH-TAM:imperative is entirely parallel.

The Σ→M lexicon does contain the cumulative correspondences shown in (7.34a,b).

(7.34)

a.	{+NEG, TH-TAM:actual} → $_D$fPRIV
b.	{+NEG, TH-TAM:imperative} → fNEG
c.	{+NEG} → fNEG

Tableaux (7.35) and (7.36) illustrate derivations of feature structures containing +NEG and TH-TAM:actual or TH-TAM:imperative. In contrast to (7.33) where the winning candidate violated MAX-ΣM, in (7.35) and (7.36) the winner satisfies it. The losing, (a) candidates are based on the correspondence shown in (7.34c), which also appears in the lexicon, but which only gives expression to the NEG feature, not to TH-TAM.

(7.35)		Σ: KALATH; { A-TAM:ins, +NEG$_1$ > TH-TAM:act$_2$}	LEX(fα)	MAX-ΣM
	☞	M: *kala*+TH+$_D$fPRIV$_{1,2}$+T$_3$		
	a.	M: *kala*+TH+fNEG$_1$+T$_3$		W$_1$

(7.36)		Σ: KALATH; {+NEG$_1$ > TH-TAM:imp$_2$}	LEX(fα)	MAX-ΣM
	☞	M: *kala*+TH+fNEG$_{1,2}$+T$_3$		
	a.	M: *kala*+TH+fNEG$_1$+T$_3$		W$_1$

7.2.3.3 The failure of CASE*:locative to be realised*

CASE:locative is not realised if in the syntax its associated DP is the daughter of a category V node (i.e., VP or V′) in a clause which associates with an A-TAM feature (Ch.6, §6.6.7.2). Feature percolation ensures that CASE:locative features attached to DP daughters of a category V node are unordered with respect to the A-TAM, TH-TAM and NEG features of the clause. Tableau (7.37) shows how the constraint NONSEQ(A-TAM) — which played a central role in the tension between A-TAM and TH-TAM/NEG — now conspires with the partial ranking || MAX(TAM) » MAX-ΣM || to ensure (i) that unordered CASE:locative and A-TAM:emotive cannot both be realised, and (ii) that the realisation of A-TAM is prioritised over CASE. The word in (7.37) is *ngambunth* 'well-EMO-T' (cf. example (6.126), Ch.6).

(7.37)

Σ: NGAMBU; {CASE:loc$_1$, A-TAM:emo$_2$, TH-TAM:appr$_3$}	DEP-ΣM	LEX(fα)	NONSEQ (A-TAM)	MAX(TAM)	*TH+A-TAM′	TH-TAM′/TH_	MAX-ΣM	LIN-ΣM
☞ M: *ngambu*+fOBL$_2$+T$_4$	1			1			2	
a. M: *ngambu*+fLOC$_1$+fOBL$_2$+T$_4$	1		W$_1$	1			L$_1$	
b. M: *ngambu*+fLOC$_1$+fOBL$_2$+fAPPR$_3$+T$_4$	1		W$_2$	L		W$_1$	L	
c. M: *ngambu*+fAPPR$_3$+fOBL$_2$+T$_4$	1		W$_1$	L		W$_1$	L$_1$	
d. M: *ngambu*+fLOC$_1$+fAPPR$_3$+T$_5$	1			1		W$_1$	L$_1$	
e. M: *ngambu*+fAPPR$_3$+T$_4$	1			1		W$_1$	2	
f. M: *ngambu*+fLOC$_1$+T$_4$	1			W$_2$			2	
g. M: *ngambu*+T$_4$	1			W$_3$			3	

As always, any candidate which realises both A-TAM and another feature with which it is unordered violates NONSEQ(A-TAM); this is true of losers (7.37a,b,c). Losers (7.37d,e) realise TH-TAM, but without any TH for it to abut, the constraint TH-TAM′/TH_ is violated. Losing candidates (7.37d,e) realise neither TAM feature, and so incur two violations of MAX(TAM). The winner is the candidate which realises just A-TAM, and neither TH-TAM nor CASE:locative.

7.2.4 Allomorphy in terms of M level structure

There are two realisational morphological phenomena which relate particularly to the morphomic feature [±weak] (abbreviated [±wk]), and which produce [+wk]~[−wk] allomorphy. To recap, the [±wk] morphomic feature is contrastive only on certain morphomes and controls whether they are realised, in the M→Φ grammar, as simple morphs (in the case of [−wk]) or as allomorph sets ([+wk]) — on these, see Ch.3, §3.13.9 and the formalisation in Ch. 4, §4.5. The first instance of [+wk]~[−wk] allomorphy relates to the realisation of CASE:proprietive and CASE:ablative. The second relates to the contrast between spoken forms and song forms (Ch.3, §3.15); in song, only [−wk] morphomes are allowed.

7.2.4.1 Allomorphy of CASE:proprietive and CASE:ablative

Both the CASE:proprietive and CASE:ablative feature values are realised as [+wk] morphomes when they appear in the word immediately before the termination T, but as [−wk] otherwise (cf. Ch.3, §3.13.9). The constraint ranking which will be used to capture this is shown in (7.38); fPROP[+wk]/_T is defined in (7.39). In addition, the multiple lexical correspondences shown in (7.40) play a crucial role.

(7.38) || R-ANCHOR(T,ω) » LEX(fα) » LEX-ΣM » fPROP[+wk]/_T » LEXPRIOR ||

(7.39) fPROP[+wk]/_T = ANCHOR(fPROP[+wk],R,T,L)

(7.40)

a.	^CASE:prop :: fPROP[+wk]	c.	^CASE:abl :: fABL[+wk]
b.	CASE:prop :: fPROP[−wk]	d.	CASE:abl :: fABL [−wk]
e.	A-TAM:prop :: fPROP[+wk]		

Tableau (7.41) shows the realisation of the simple feature structure {CASE:prop}. The winning candidate satisfies all relevant constraints, while the loser violates LEXPRIOR because it does not match the preferred correspondence in (7.40a).

(7.41)	Σ: S; {CASE:prop$_1$}	R-ANCHOR (T,ω)	LEX(fα)	LEX-ΣM	fPROP [+wk]/_T	LEXPRIOR
☞	M: S+$_{\text{D}}$fPROP[+wk]$_1$+T$_2$					
a.	M: S+$_{\text{D}}$fPROP[−wk]$_1$+T$_2$					W$_1$

Tableau (7.42) shows the realisation of {CASE:prop > COMP:plain}.

(7.42)	Σ: S; {CASE:prop$_1$>COMP:plain$_2$}	R-ANCHOR (T,ω)	LEX(fα)	MAX-ΣM	LIN-ΣM	LEX-ΣM	fPROP [+wk]/_T	LEXPRIOR
☞	M: S+$_{\text{D}}$fPROP[−wk]$_1$+fOBL$_2$+T$_2$							1
a.	M: S+$_{\text{D}}$fPROP[+wk]$_1$+fOBL$_2$+T$_2$						W$_1$	L
b.	M: S+$_{\text{D}}$fPROP[+wk]$_1$+T$_2$+fOBL$_2$	W$_1$						L
c.	M: S+$_{\text{D}}$fPROP[+wk]$_1$+T$_2$			W$_1$				L
d.	M: S+fOBL$_2$+$_{\text{D}}$fPROP[+wk]$_1$+T$_2$				W$_1$			L

Here, the fPROP which realises CASE:prop appears before fOBL, and thus the losing candidate (7.42a), with fPROP[+wk] in its output, violates fPROP[+wk]/_T. Loser (7.42b) escapes that violation by placing T between fPROP and fOBL, but in doing so violates R-ANCHOR(T,ω). Losers (7.42c,d) position fPROP[+wk] before T, but violate MAX-ΣM and LIN-ΣM in doing so. The winning candidate satisfies all constraints violated by the losing candidates, but violates LEXPRIOR in order to do so.

By way of contrast, the realisation of A-TAM:future is different, and shown in tableau (7.43). Crucial in this case is that A-TAM:future has only one correspondence listed in the lexicon: 'A-TAM:future :: fPROP[+wk]', as shown above in (7.40e). This time, any candidate with fPROP[−wk] violates LEX(fα), and so the most harmonic candidate with fPROP[+wk] is the winner.

(7.43)

	Σ: S; {A-TAM:fut$_1$, TH-TAM:pot$_2$ >COMP:plain$_2$}	R-ANCHOR (T,ω)	LEX(fα)	LEX-ΣM	fPROP [+wk]/_T	LEXPRIOR
☞	M: S+$_D$fPROP[+wk]$_1$+fOBL$_2$+T$_2$				1	
a.	M: S+$_D$fPROP[−wk]$_1$+fOBL$_2$+T$_2$			W$_1$	L	

7.2.4.2 Song forms in M

In song, the strong/weak allomorphy found in spoken Kayardild is absent (Ch.3, §3.15). This is formalised here by ranking *[+wk]/SONG and LEX-ΣM (i.e., the un-parameterised constraint) as shown in (7.44).

(7.44) || *[+wk]/SONG » MAX-ΣM » LEX-ΣM ||

Tableaux (7.45) and (7.46) show the derivations of song words inflected respectively for {CASE:prop} and {A-TAM:fut}; cf (7.41) and (7.42) above for the spoken register equivalents. The losing candidates (7.45a) and (7.46a) contain fPROP[+wk] and so violate *[+wk]/SONG; other losers do not contain [+wk], but in avoiding it end up violating either LEX(fα) or MAX-ΣM.

(7.45)

	SONG Σ: S; {CASE:prop$_1$}	LEX(fα)	*[+wk]/SONG	MAX-ΣM	LEX-ΣM	fPROP[+wk]/_T	LEXPRIOR
☞	M: S+$_D$fPROP[−wk]$_1$+T$_2$						1
a.	M: S+$_D$fPROP[+wk]$_1$+T$_2$		W$_1$				L
b.	M: S+$_D$fASSOC$_1$+T$_2$	W$_1$			W$_1$		1
c.	M: S+T$_2$			W$_1$			

(7.46)

	SONG Σ: S; {A-TAM:fut$_1$, TH-TAM:pot$_2$ >COMP:plain$_2$}	LEX(fα)	*[+wk]/SONG	MAX-ΣM	LEX-ΣM	fPROP[+wk]/_T	LEXPRIOR
☞	M: S+$_D$fPROP[−wk]$_1$+fOBL$_2$+T$_3$				1		1
a.	M: S+$_D$fPROP[+wk]$_1$+fOBL$_2$+T$_3$		W$_1$		L		L
b.	M: S+$_D$fASSOC$_1$+fOBL$_2$+T$_3$	W$_1$			1		1
c.	M: S+fOBL$_2$+T$_3$			W$_1$	L		

7.2.5 Linearisation of specific morphomes

The morphomes fOBL (formal oblique), fDES (formal desiderative) and fLOC (formal locative) all have particular restrictions on their linear arrangement within the word. These are analysed in turn below.

7.2.5.1 Linearisation and fOBL

In §7.2.3.1, tableau (7.32) above we saw that when A-TAM and TH-TAM features are ordered with respect to one another within a feature structure, by virtue of having been associated with an embedded clause structure in the syntax, then they are realised at the M level by morphomes whose ordering mimics that in the Σ level feature structure, due to the influence of LIN-ΣM. However, sequencing restrictions on fOBL can overrule that general pattern.

An fOBL morphome must always appear to the immediate left of the termination, T, even at the expense of contradicting the ordering in a Σ level feature structure, and violating LIN-ΣM. This is illustrated in tableau (7.48) below, where the feature structure is that of a word in an embedded clause structure, in which the embedded clause is associated with A-TAM:cont (realised by fOBL), and the upper clause with A-TAM:fut (realised by fPROP). The constraint which enforces the linearisation of fOBL is fOBL/_T:

(7.47) fOBL/_T = ANCHOR(fOBL,R,T,L)

(7.48)

	Σ: S; {A-TAM:cont$_1$, TH-TAM:prog$_2$ > A-TAM:fut$_3$, TH-TAM:pot$_4$}	R-ANCHOR (ω,T)	fOBL/_T	MAX(TAM)	TH-TAM′/TH_	LIN-ΣM
☞	M: S+fPROP[+wk]$_3$+fOBL$_1$+T$_5$					1
a.	M: S+fOBL$_1$+fPROP[+wk]$_3$+T$_5$		W$_1$			L
b.	M: S+fOBL$_1$+T$_5$+fPROP[+wk]$_3$	W$_1$				L
c.	M: S+fOBL$_1$+T$_5$			W$_1$		L
d.	M: S+fPROP[+wk]$_3$+T$_5$			W$_1$		L
e.	M: S+fN$_2$+fPROP[+wk]$_3$+T$_5$				W$_1$	L

The winning candidate orders the realisation of matrix A-TAM before that of embedded A-TAM, and in doing so escapes a violation of fOBL/_T, though it does violate LIN-ΣM. Losing candidate (7.48a) places those realisations in the more usual order and in doing so violates high-ranked fOBL/_T, even though it avoids violating LIN-ΣM. The other losers also avoid the winner's violation of LIN-ΣM, but in doing so all violate higher-ranked constraints, including (7.48d,e) which each avoid the problem of ordering fOBL by not realising A-TAM:cont.

Kayardild does not permit sequences *fOBL-fOBL.[4] When two features which are usually realised by fOBL appear in the same feature structure, even when they are ordered with respect to one another, only one fOBL surfaces. Tableau (7.49) illustrates this.

(7.49)

Σ: S; {A-TAM:emo$_1$, TH-TAM:appr$_2$ > COMP:plain$_3$}	fOBL/_T	LEX(fα)	MAX(TAM)	TH-TAM'/TH_	MAX-ΣM	LIN-ΣM
☞ M: S+fOBL$_1$+T$_5$			1		2	
a. M: S+fAPPR$_2$+fOBL$_3$+T$_5$			1	W$_1$	L$_1$	
b. M: S+fOBL$_3$+T$_5$			W$_2$	W$_1$	2	
c. M: S+fOBL$_{1,3}$+T$_5$		W$_1$	1		L$_1$	
d. M: S+fOBL$_1$+fOBL$_3$+T$_5$	W$_1$		1		L$_1$	

[4] The fact that one does not find *fOBL-fOBL in the output can appear to be due to 'morphological haplology', i.e., morphological deletion motivated by a ban on adjacent, formally identical morphs. Such phenomena have been discussed by Yip (1998) with respect to realisational morphology in OT, and by Austin (1995) with respect to the Australian language Jiwarli. However, in the general case, Kayardild does permit adjacent, identical morphs (Evans 1995a:132), as can be seen for example in sentence (B.31) in Appendix B. The ban on *fOBL-fOBL is more neatly analysed in terms of a constraint that demands every fOBL morphome be adjacent to T.

The losing candidate with two fOBL morphemes (7.49d) violates fOBL/_T, and loser (7.49c) violates LEX(fα) because there are no correspondences in the ΣM lexical which relate two feature values to a single fOBL morpheme in the lexicon.[5] Loser (7.49a) violates TH-TAM′/TH_ by placing a realisation of TH-TAM after something other than TH, and loser (7.49b) fails because it realises a COMP feature rather than A-TAM and so violates MAX(TAM).

A subtle point which plays a crucial role in (7.49) is the partial ranking of || MAX(TAM) » MAX-ΣM || — the same ranking which was decisive in suppressing CASE:locative in §7.2.3.3 above. In (7.49), loser (7.49a) would win if the ranking of these two constraints was reversed. The partial ranking || MAX(TAM) » MAX-ΣM || expresses the fact that ensuring the realisation of a non-TAM feature is less valued than ensuring the realisation of TAM feature. This is why the realisation of CASE, rather than of A-TAM, was suppressed in §7.2.3.3. The same principle will surface again in the next section.

7.2.5.2 Linearisation and fDES

The formal desiderative morpheme, fDES realises just one feature value, TH-TAM:desiderative. For reasons which are currently unclear, clauses with TH-TAM:des are

[5] It would be possible to enter correspondences in the lexicon, such that every combination of features values {F:v,G:w} maps to fOBL if both {F:v} and {G:w} do so on their own, however this approach would represent the generalisation as being at root a matter of mappings from feature values to morphemes. By contrast, the current analysis casts the generalisation as a matter of morphemes only, and not one involving the lexicon: the generalisation is simply that fOBL must appear next to T, and hence only one token can appear.

often complementised in my corpus, but only with COMP:plain; clauses with {TH-TAM:des, COMP:empathy} are unattested. This is a syntactic fact, not merely a morphological one: evidence of a COMP:empathy feature should be detectable elsewhere in a COMP:empathy clause, even if for morphological reasons it were not realised in a word form in which {TH-TAM:des} were realised. Setting aside this syntactic fact and focusing on the realisation of words in attested clauses, we begin by observing that the COMP:plain feature value is usually realised by fOBL, yet on words which are expected to inflect for {TH-TAM:des > COMP:plain} the output combination *fDES-fOBL is not found. The absence of *fDES-fOBL could be described from any of several angles, for example: (i) like fOBL, fDES must appear immediately before T; (ii) fOBL cannot follow fDES (and yet cannot precede it because it must precede T); (iii) fDES cannot precede fOBL. In the absence of evidence which favours any of these interpretations over the others, I will employ here the simplest statement of the fact: *fDES-fOBL is not permitted. This will be formalised in a markedness constraint *fDES-fOBL.

The fact that fDES (which realises TH-TAM) surfaces, while fOBL (which realises COMP) does not, follows from the partial ranking || MAX(TAM) » MAX-ΣM ||. Tableau (7.50) shows the derivation of a word overtly inflect for TH-TAM:des but not for COMP:plain.

(7.50) Σ: KALATH; {A-TAM:emo$_1$, TH-TAM:des$_2$, > COMP:plain$_3$}	R-ANCHOR (T, ω)	*fDES-fOBL	ANCHOR (fOBL,R,T,L)	LEX(fα)	MAX(TAM)	*TH+A-TAM′	MAX-ΣM	LIN-ΣM
☞ M: *kala*+TH+fDES$_2$+T$_4$					$_1$		$_2$	
a. M: *kala*+TH+fOBL$_3$+T$_4$					W$_2$		$_2$	
b. M: *kala*+TH+fOBL$_3$+fDES$_2$+T$_4$			W$_1$		$_1$		L$_1$	W$_1$
c. M: *kala*+TH+fDES$_2$+fOBL$_3$+T$_4$		W$_1$			$_1$		L$_1$	
d. M: *kala*+TH+fDES$_{2,3}$+T$_4$				W$_1$	$_1$		L$_1$	
f. M: *kala*+TH+fOBL$_1$+T$_4$					$_1$	W$_1$	$_2$	

The crucial difference between the winner and loser (7.50a), which realises just COMP:empathy, is the constraint MAX(TAM). Other losers fail for reasons discussed in §7.2.3, in relation to A-TAM and TH-TAM.

7.2.5.3 Linearisation and fLOC

By the time we reach the Φ-level, fLOC will only appear before fABL, fALL, or T, or be realised cumulatively with fOBL (cf Ch3., §3.13.7; Ch.6, §§6.2.8–6.2.9). That restriction will be implemented here at the M-level, by use of the cover constraint fLOC-CONDITION in (7.51).

(7.51) fLOC-COND cover constraint
Cover constraint for all constraints *fLOCλ, for all morphomes λ ∈ L, where L is the set of all morphomes except for fABL, fALL, fOBL and T.

The high rankings (already established) of DEP-ΣM and LEX(fα) will ensure that fLOC-COND is not enforced by the insertion of a vacuous morphome or by the realisation of a feature value in a manner contravening the lexicon. An additional constraint — the parameterised constraint LINEARITY(fLOC) (7.52) — is required to ensure that fLOC-COND is not enforced by merely relocating fLOC to a more suitable position, in a manner parallel to the shifting of fOBL to the immediate left of T (§7.2.5.1).

(7.52) LIN(fLOC) ‘no pair-wise reorderings involving fLOC’
For two elements *a*,*b* in Σ such that *a* linearly precedes *b*, and the elements *a′*,*b′* in M of which one is fLOC, and where *a* corresponds to *a′* and *b* to *b′*, *b′* does not precede *a′*.

(7.53) || DEP-ΣM, LEX(fα), LIN(fLOC), fLOC-COND » MAX-ΣM ||

Ranking LIN(fLOC) and fLOC-COND above MAX-ΣM, as shown in (7.53) ensures that fLOC-COND is enforce through the suppression of some feature’s realisation. At this point, let us move directly to the example tableau shown in (7.54).

(7.54)

	Σ: S; {CASE:loc$_1$, > A-TAM:fut$_2$, TH-TAM:pot$_3$}	DEP-ΣM	LEX(fα)	LIN(fLOC)	fLOC-COND	MAX(TAM)	MAX-ΣM	LIN-ΣM
☞	M: S+fPROP[+wk]$_2$+T$_4$	1				1	2	
a.	M: S+fLOC$_1$+T$_4$	1				W$_2$	2	
b.	M: S+fLOC$_1$+fPROP[+wk]$_2$+T$_4$	1			W$_1$	1	L$_1$	
c.	M: S +fPROP[+wk]$_2$+fLOC$_1$+T$_4$	1		W$_1$		1	L$_1$	W$_1$
d.	M: S+fINST$_1$+fPROP[+wk]$_2$+T$_4$	1	W$_1$			1	L$_1$	
e.	M: S+fLOC$_1$+fALL+fPROP[+wk]$_2$+T$_4$	W$_2$				1	L$_1$	

In (7.54), fLOC-COND is satisfied, as required, via the suppression of a feature value’s realisation. As it happens, the correct feature-value is suppressed — the CASE:loc which would otherwise have been realised as fLOC. The reason CASE:loc is suppressed in (7.54), is that MAX(TAM) favours the realisation of the A-TAM feature which follows it. In the general case though, this confluence of forces will lead not to the suppression of fLOC, but to the suppression of any non-TAM feature in favour of an A-TAM or TH-TAM feature. A general method for favouring fLOC will be proposed presently, but first we can confirm that in fact, this favouring of TAM features actually works in our favour.

When fLOC itself realises an A-TAM or TH-TAM feature, the current feature ranking will actually conspire to protect it rather than suppress it, which on the face of it could be problematic. However, all A-TAM and TH-TAM features realised by fLOC (*viz.* A-TAM:instantiated, A-TAM:present, TH-TAM:immediate) can only ever be followed in a word's feature set by COMP:plain or COMP:empathy. This follows from the fact that the A-TAM and TH-TAM features which are realised by fLOC do not occur in subordinate clauses and hence cannot end up ordered before other A-TAM or TH-TAM features within a feature set (cf. Ch.6, §§6.5.3,6.5.4.4 regarding features that appear in subordinate clauses). Next, we observe that COMP:plain is realised by fOBL, and COMP:empathy by fLOC. This means that if any A-TAM or TH-TAM feature value, realised by fLOC, were to surface next to the realisation of its following feature, the resulting combination would be fLOC-fOBL or fLOC-fLOC. The former does not violate fLOC-COND, and indeed it surfaces without a problem as shown in (7.55). The latter violates fLOC-COND, but all we need in this case is for *either* of the features to be suppressed. As shown in (7.56), the COMP:empathy feature is suppressed. In sum, the fact that || MAX(TAM) » MAX || can work to favour the surfacing of fLOC when it realises an A-TAM or TH-TAM value, is unproblematic.

When reading (7.55) and (7.56), it will be relevant to know that A-TAM:present and COMP:empathy are usually realised by fLOC, if their realisation is not suppressed.

(7.55)

Σ: S; {A-TAM:pres$_1$, TH-TAM:immed$_2$, > COMP:plain$_3$}		DEP-ΣM	LEX(fα)	LIN(fLOC)	fLOC-COND	MAX(TAM)	MAX-ΣM	LIN-ΣM
☞	M: S+fLOC$_1$+fOBL$_3$+T$_4$	1				1	1	
a.	M: S+fLOC$_1$+T$_4$	1				1	W$_2$	
b.	M: S+fOBL$_3$+T$_4$	1				W$_2$	W$_2$	

(7.56)

Σ: S; {A-TAM:pres$_1$, TH-TAM:immed$_2$, > COMP:emp$_3$}		DEP-ΣM	LEX(fα)	LIN(fLOC)	fLOC-COND	MAX(TAM)	MAX-ΣM	LIN-ΣM
☞	M: S+fLOC$_1$+T$_4$	1				1	2	
a.	M: S+fLOC$_1$+fLOC$_3$+T$_4$	1			W$_1$	1	L$_1$	
b.	M: S+fLOC$_3$+T$_4$	1				W$_2$	2	

Let us finally consider cases in which no A-TAM or TH-TAM features are involved. We still wish fLOC to delete in order to avoid violating fLOC-COND. This can be ensured with the very low partial ranking of || *fLOC » *M ||.

(7.57) *fLOC
No fLOC morphome appears in the output (at the M-level). One violation is incurred for each which does.

(7.58) *M
No morphome appears in the output (at the M-level). One violation is incurred for each which does.

An example tableau is shown in (7.59). The word being inflected is *walbunguni* 'raft-INST', with an associated embedded case structure {CASE:loc > CASE:instrumental}.[6] Crucially here, MAX(TAM) plays no role and the constraint *fLOC selects the winner over loser (7.59a).

(7.59)

Σ: WALBU; {CASE:loc_1, > CASE:$inst_2$}	DEP-ΣM	LEX(fα)	LIN(fLOC)	fLOC-COND	MAX(TAM)	MAX-ΣM	LIN-ΣM	*FLOC	*M
☞ M: *walbu*+$fINST_2$+T_3	1					1			3
a. M: *walbu*+$fLOC_1$+T_3	1					1		W_1	3
b. M: *walbu*+$fLOC_1$+$fINST_2$+T_3	1			W_1		L_2		W_1	W_4

WALBU 'raft' → *walbu*

7.2.6 Constraint ranking in Σ→M

We have now completed the survey of the Σ→M mapping. The overall constraint ranking which has been argued for is presented in (7.60).

[6] This might be found, for example in the Kayardild equivalent of 'tie it [with the rope (that is) [on **the raft**]]'.

(7.60) Constraint ranking, Σ→M

Undominated:

{ LexStem, L-Anchor(ω,stem), R-Anchor(ω,t), R-Anchor(t,ω), Lex(fα)
fobl/_t, *fdesfobl, floc-cond, Lin(floc), neg′/th_, Nonseq(a-tam), *[+wk]/song }

Dep-ΣM

Max(tam)

*th+a-tam′

th-tam′/th_

Max-ΣM

*floc Lin-ΣM Lex-ΣM

*M fprop[+wk]/_t

LexPrior-case:prop

7.3 M→Φ grammar

We move now to the M→Φ grammar. In this grammar, outputs are morphs or allomorph sets, each bearing an accompanying stratal diacritic and an indication of whether it is a root or suffix. Since we are most interested in inflection, which involves just suffixes, the root/suffix distinction will not be displayed below. The M→Φ grammar is also where allomorphy is found which is conditioned by underlying phonological form. We begin though with the MΦ lexicon.

7.3.1 The MΦ lexicon

The lexicon of M→Φ correspondences is shown in (7.61). Stratal diacritics referring to hiatus resolution are given only where contrastive: many morphs never undergo hiatus resolution and so could be plausibly submitted to any class of modifications. A small number of morphomes will have had their stratal diacritic specified in the Σ→M grammar, and so these are not associated with a diacritic in the correspondence shown in (7.61).

(7.61) Lexicon of M→Φ correspondences

fABL[+wk] :: {$_\mathrm{D}$naa>$_\mathrm{D}$napa}	fMID :: $_\mathrm{D}$i
fABL[−wk] :: $_\mathrm{D}$napa	fN :: $_\mathrm{R}$n
^fALL :: {$_\mathrm{R}$ɻiŋ>$_\mathrm{R}$ɻuŋ}	fNEG :: $_\mathrm{R}$naŋ
fALL :: $_\mathrm{R}$ɻiŋ	fOABL :: $_\mathrm{R}$wula
fAPPR :: $_\mathrm{L}$ɲara	^fOBL :: $_\mathrm{L/I}$in̪t̪a
fASSOC :: $_\mathrm{R}$nuru	fOBL :: $_\mathrm{L/III}$in̪t̪a
fCONS[+wk] :: {ŋara>ŋarpa}	fOEVIT :: $_\mathrm{R}$waːlu
fCONS[−wk] :: ŋarpa	fORIG :: $_\mathrm{R}$waːɲ
fDAT :: $_\mathrm{R}$maɻu	fPL :: $_\mathrm{L}$palat̪
fDEN :: $_\mathrm{R}$wiʈi	fPRIV :: wari
fDES :: $_\mathrm{R}$ta	fPROP[+wk] :: {$_\mathrm{D}$kuu>$_\mathrm{D}$kuɻu}
fDON :: wu	fPROP[−wk] :: $_\mathrm{D}$kuɻu
fDU :: $_\mathrm{D/I}$kiarŋ	fRES :: $_\mathrm{R}$iriɲ
fGEN :: $_\mathrm{R}$karaɳ	fUTIL :: $_\mathrm{R}$mara
fHALL :: $_\mathrm{R}$cani	^T :: {$_\mathrm{R}$a>ø}
fINCH :: $_\mathrm{R}$wa	T :: $_\mathrm{R}$ta
fINST :: $_\mathrm{R}$ŋuni	T :: $_\mathrm{D}$ka
fLLOC :: $_\mathrm{D/II}$kiː	TH :: $_\mathrm{R}$t̪
fLOC :: $_\mathrm{D/I}$ki	TH$^\mathrm{c}$ :: $_\mathrm{R}$c
^fALL.T :: {$_\mathrm{R}$ɻi>$_\mathrm{R}$ɻu}	fGEN.T :: $_\mathrm{R}$kara
fALL.T :: $_\mathrm{R}$ɻi	fNEG.T :: $_\mathrm{R}$na

7.3.2 Ligative fLOC

At the Φ-level, all fABL and fALL morphomes which realise inflectional featurs are preceded by fLOC (Ch.3, §3.12.8; Ch.6, §6.2.8), though this is not so at the M-level. Insertion of fLOC will be acheived by ranking fABL′/fLOC′_ and fALL′/fLOC′_ above DEP-MΦ, but below MAX-MΦ and LIN-MΦ, and also below LEXSTEM-MΦ, a cover constraint which penalises additions, deletions, substitutions and rearrangements within the lexical stem. With LEXSTEM undominated, epenthetic fLOC morphomes cannot be interposed between morphomes in the stem.

(7.62) fABL′/fLOC′_ = Anchor(fABL′,L,fLOC′,R)

(7.63) fALL′/fLOC′_ = Anchor(fALL′,L,fLOC′,R)

(7.64) || LEXSTEM-MΦ, MAX-MΦ, LINMΦ » fABL′/fLOC′_ , fALL′/fLOC′_ » DEP-MΦ ||

An example tableau featuring fABL is shown in (7.65).

(7.65)

	M: S+fABL[−wk]$_{1}$+fLOC$_{2}$+T$_{3}$	LEXSTEM -MΦ	MAX -MΦ	LIN -MΦ	fALL′ /fLOC′_	DEP -MΦ
☞	M: S+$_{\mathrm{D}}$ki$_{4}$+$_{\mathrm{D}}$napa$_{1}$+$_{\mathrm{D}}$ki$_{2}$+{$_{\mathrm{R}}$a>ø}T$_{3}$					1
a.	M: S+$_{\mathrm{D}}$napa$_{1}$+$_{\mathrm{D}}$ki$_{2}$+{$_{\mathrm{R}}$a>ø}T$_{3}$				W$_{1}$	L
b.	M: S+$_{\mathrm{D}}$ki$_{2}$+$_{\mathrm{D}}$napa$_{1}$+{$_{\mathrm{R}}$a>ø}T$_{3}$			W$_{1}$		L
c.	M: S+$_{\mathrm{D}}$ki$_{2}$+{$_{\mathrm{R}}$a>ø}T$_{3}$		W$_{1}$			L

7.3.3 Cumulative exponence in MΦ

Several pairs of morphomes at the M-level are realised by single morphs at the Φ-level. These are the cumulative termination (T) morphs, and the cumulative fLOC.fOBL morph

$_D$/kurka/. In fact adjacent morphomes, *a+b,* in the input will *always* be realised by a cumulative morph if one exists in the lexicon, even though realisations are also listed for *a* and for *b* separately. In a constraint based grammar, this behaviour can be induced by ranking a constraint such as MAX-MΦ, which demands that the input be completely realised, over a constraint such as *μ, which penalises output elements.[7]

(7.66) *μ
No morph appears in the output (at the Φ-level). One violation is incurred for each which does.

Example tableaux are shown in (7.68) and (7.69). The relevant lexical correspondences are shown in (7.67a–c) and (7.67d–g).[8]

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[7] This kind of behaviour, in which a more specific form is used in favour of two less specific ones is familiar from many linguistic phenomena, and is arguably a special case of a general principle of natural language grammar: that of a set of available correspondences or rules which could apply to an input, those with the most specific structural definitions are the ones which do apply (the principle has been expressed elsewhere as Kiparksy's (1973b) Elsewhere Principle in rule based generative phonology, and as the Anderson's (1992) Pāṇinian Determination Hypothesis, Halle's (1997) Subset Principle and Stump's (2001) Pāṇini's Principle in realisational morphology). The formalism employed here is not equivalent to that principle, rather it demands that as as few morphomes as possible be realised. Although analogous, structure-penalising approaches to similar phenomena are not uncommon in OT, and although the formalism produces the right results in this case, those results arguably should fall out from the more general principle just mentioned. The formulation of such an analysis in constraint based terms is beyond the scope of the present study, however.

[8] On the selection of the T allomorphs $_D$ka versus {$_R$a>ø}, see §7.3.5.2 below.

(7.67)				
a.	fNEG.T :: $_{\text{R}}$na		d.	fLOC.fOBL :: $_{\text{R}}$kurka
b.	fNEG :: $_{\text{R}}$naŋ		e.	fLOC:: $_{\text{D}}$ki
c.	T:: $_{\text{D}}$ka		f.	fOBL :: $_{\text{L/I}}$in̪t̪a
			g.	T:: {$_{\text{R}}$a>ø}

(7.68)

	M: *kala*+TH+fNEG$_1$+T$_2$	MAX-MΦ	*μ
☞	Φ: kala+$_{\text{R}}$t̪+$_{\text{R}}$na$_{1,2}$		3
a.	Φ: kala+$_{\text{R}}$t̪+$_{\text{R}}$naŋ$_1$+$_{\text{D}}$ka$_2$		W$_4$
b.	Φ: kala+$_{\text{R}}$t̪+$_{\text{R}}$naŋ$_1$	W$_1$	3

(7.69)

	M: *kala*+TH+fLOC$_1$+fOBL$_2$+T$_3$	MAX-MΦ	*μ
☞	Φ: kala+$_{\text{R}}$t̪+$_{\text{D}}$kurka$_{1,2}$+{$_{\text{R}}$a>ø}$_3$		4
a.	Φ: kala+$_{\text{R}}$t̪+$_{\text{D}}$ki$_1$+$_{\text{L}}$in̪t̪a$_2$+{$_{\text{R}}$a>ø}$_3$		W$_5$
b.	Φ: kala+$_{\text{R}}$t̪+$_{\text{D}}$ki$_1$+{$_{\text{R}}$a>ø}$_3$	W$_1$	4

In (7.68) and (7.69) the losing (a) candidates contain separate realisations of the relevant morphs, and in doing so incur an extra, critical violation of *μ relative to the winning candidate; losers (b) contain the same number of morphs as the winner, but realise less of input, and so fare poorly with respect to MAX-MΦ.

7.3.4 Stratal diacritics

Stratal diacritics which appear in the Φ level representation are analysed here as deriving from two possible sources. Firstly, we can recall that already in the Σ→M grammar some morphosyntactic feature values were realised as morphomes with particular stratal diacritics; these diacritics will now need to be carried through to the Φ level output. The constraint MAX(DIAC) will be used to this end.

(7.70) MAX(DIAC) ‘realise input stratal diacritics’
A stratal diacritic associated with element *a* in the M-level input is associated with element *a′*, the correspondent of *a*, in the Φ-level output.

Secondly, most morphs’ stratal diacritics will be taken from the lexicon. Constraints LEX-MΦ (the unparameterised constraint) and LEX(μ), defined in (7.71), will both be used.

(7.71) LEX(μ) ‘no unlicensed morph mappings’
For a corresponding M→Φ pair *a* and *a′*, a mapping *a*→*b′* is present in the M→Φ lexicon, where *a′* and *b′* share the same morph (i.e., ignoring stratal diacritics).

Issues pertaining to the stratal diacritics of fOBL are addressed in §7.3.5.1 below.

An example tableau in which diacritics are maintained from the input is shown in (7.72).

(7.72)

	M: *dangka*$_1$+$_R$fPRIV$_2$+T$_3$	LEX(μ)	MAX (DIAC)	LEX-MΦ
☞	Φ: ʈaŋka$_1$+$_R$wari$_2$+{$_R$a>ø}$_3$			1
a.	Φ: ʈaŋka$_1$+$_D$wari$_2$+{$_R$a>ø}$_3$		W$_1$	1
b.	Φ: ʈaŋka$_1$+$_R$mara$_2$+{$_R$a>ø}$_3$	W$_1$		1
c.	Φ: ʈaŋka$_1$+$_R$wari$_2$+{$_L$a>ø}$_3$			W$_2$

Because the input contains $_R$fPRIV, a morphome with a stratal diacritc, and because there is no corespondence in the MΦ lexicon between $_R$fPRIV and Φ level form, all candidates violate LEX-MΦ. However, there is a corespondence ‘fPRIV :: /wari/’ in the lexicon, and so both the winner and losers (7.72a,c) satisfy LEX(μ). Nevertheless, losing candidate (7.72a) fails to retain the input diacritic, and so violates MAX(DIAC). Tableau (7.72) also illustrates diacritics being taken from the lexicon. The diacritic for the termination T is not part of the input and so needs to match the diacritic of some correspondence in the lexicon. Loser (7.72c) fails to do this.

7.3.5 Allomorphy in terms of Φ level structure

This section analyses two instances of allomorphy in terms of Φ level structure, and which is sensitive to Φ level structure, i.e., to underlying phonological form. The first instance relates to the formal oblique (fOBL) and its stratal diacritic, and the second to the termination T.

7.3.5.1 The stratal diacritic of fOBL

The stratal diacritic of a given fOBL token is determined by whether that token follows a CV root, or something else (cf Ch.4, §4.4.2). In the default case the diacritic of fOBL is L/I, but after a CV root it is L/III. The constraint ranking and lexical entries used to capture the facts are shown in (7.73) and (7.74); the markedness constraint $^{*}CV_{ROOT}{+}_{L/I}$fOBL′ is defined in (7.75). Tableaux (7.76) and (7.77) illustrate the selection of the appropriate stratal diacritic.

(7.73) || LEX-MΦ, *CV$_{\text{ROOT}}$+$_{\text{L/I}}$fOBL′ » LEXPRIOR ||

(7.74)	a. ^fOBL :: $_{\text{L/I}}$in̪t̪a	b. fOBL :: $_{\text{L/III}}$in̪t̪a

(7.75) *CV$_{\text{ROOT}}$+$_{\text{L/I}}$fOBL′
fOBL is realised as a morph with the L/III stratal diacritic after a CV root.

(7.76)

	M: *dangka*$_1$+fOBL$_2$+T$_3$	LEX-MΦ	*CV$_{\text{ROOT}}$ +$_{\text{L/I}}$fOBL′	LEXPRIOR
☞	Φ: ʈaŋka$_1$+$_{\text{L/I}}$in̪t̪a$_2$+{$_{\text{R}}$a>ø}$_3$			
a.	Φ: ʈaŋka$_1$+$_{\text{L/III}}$in̪t̪a$_2$+{$_{\text{R}}$a>ø}$_3$			W$_1$
b.	Φ: ʈaŋka$_1$+$_{\text{D/V}}$in̪t̪a$_2$+{$_{\text{R}}$a>ø}$_3$	W$_1$		W$_1$

dangka ‘person’ → ʈaŋka

(7.77)

	M: *ja*+fOBL$_2$+T$_3$	LEX-MΦ	*CV$_{\text{ROOT}}$ +$_{\text{L/I}}$fOBL′	LEXPRIOR
☞	Φ: ca+$_{\text{L/III}}$in̪t̪a$_2$+{$_{\text{R}}$a>ø}$_3$			1
a.	Φ: ca+$_{\text{L/I}}$in̪t̪a$_2$+{$_{\text{R}}$a>ø}$_3$		W$_1$	L
b.	Φ: ca+$_{\text{D/V}}$in̪t̪a$_2$+{$_{\text{R}}$a>ø}$_3$	W$_1$	W$_1$	1

ja ‘foot’ → ca

7.3.5.2 Allomorphy of the termination, T

The termination, T, is underlyingly {$_{\text{R}}$a>ø} after a preceding vowel, $_{\text{D}}$ka after a preceding velar consonant and $_{\text{R}}$ta after a preceding coronal consonant (Ch.3, §3.7; Ch.4, §4.5). This pattern is analysed here in terms of the markednes constraints (7.78)–(7.79), ranked as shown in (7.80), and the lexical correspondences shown in (7.81).

(7.78) *C{$_\text{R}$a>ø}

The Φ level output does not contain a consonant followed by the allomorph set {$_\text{R}$a>ø}.

(7.79) *AGREE(coronal)/CC

Adjacent consonants in the output have the same value of [±coronal]. One violation is incurred for each pair which does not agree.

(7.80) || LEX-MΦ, *C{$_\text{R}$a>ø} » AGREE(cor) » LEXPRIOR ||

(7.81)

a. ^T :: {$_\text{R}$a>ø}	b. T :: $_\text{R}$ta	c. T :: $_\text{D}$ka

Tableaux (7.82)–(7.84) illustrate the selection of the correct allomorphs.

(7.82)

M: *nal*+T	LEX-MΦ	*C{$_\text{R}$a>ø}	AGREE(cor)	LEXPRIOR-T
☞ Φ: ɳal+$_\text{R}$ta				1
a. Φ: ɳal+$_\text{D}$ka			W_1	1
b. Φ: ɳal+{$_\text{R}$a>ø}		W_1		L

nal → /ɳal/

(7.83)

M: *kang*+T	LEX-MΦ	*C{$_\text{R}$a>ø}	AGREE(cor)	LEXPRIOR-T
☞ Φ: kaŋ+$_\text{D}$ka				1
a. Φ: kaŋ+$_\text{R}$ta			W_1	1
b. Φ: kaŋ+{$_\text{R}$a>ø}		W_1		L

kang → /kaŋ/

(7.84)

M: *maku*+T	LEX-MΦ	*C{$_\text{R}$a>ø}	AGREE(cor)	LEXPRIOR-T
☞ Φ: maku+{$_\text{R}$a>ø}				
a. Φ: maku+$_\text{D}$ka				W_1
b. Φ: maku+$_\text{R}$ta				W_1

maku → /maku/

7.3.6 Register-based allomorphy of fALL

The formal allative (fALL) is realised as underlying {Rɻiŋ>Rɻuŋ} in song, but as R/ɻiŋ/ in the spoken register. Likewise, the cumulative realisation of fALL.T is {Rɻi>Rɻu} in song but R/ɻi/ otherwise. This is formalised here using the markedness constraints (7.85)–(7.86), ranked as shown in (7.87), and the lexical correspondences shown in (7.88).

(7.85) *{Rɻiŋ>Rɻuŋ}/SPOKEN (7.86) *{Rɻi>Rɻu}/SPOKEN

(7.87) || LEX-MΦ, *{Rɻiŋ>Rɻuŋ}/SP., *{Rɻi>Rɻu}/SP. » LEXPRIOR ||

(7.88)

a.	^fALL :: {Rɻiŋ>Rɻuŋ}	c.	^fALL.T :: {Rɻi>Rɻu}
b.	fALL :: Rɻiŋ	d.	fALL.T :: Rɻi

Illustrative tableaux are shown in (7.89) and (7.90). The extra fLOC morphome, which appears just after the stem in the output, appears for reasons discussed in §7.3.2 above.

(7.89)

	SONG M: S+fALL$_1$+fLOC$_2$+T$_3$	LEX-MΦ	*{Rɻiŋ>Rɻuŋ} /SPOKEN	LEXPRIOR
☞	Φ: S+fLOC$_4$+{Rɻiŋ>Rɻuŋ}$_1$+fLOC$_2$+{Ra>ø}$_3$			
a.	Φ: S+fLOC$_4$+Rɻiŋ$_1$+fLOC$_2$+{Ra>ø}$_3$			W$_1$

(7.90)

	SPOKEN M: S+fALL$_1$+fLOC$_2$+T$_3$	LEX-MΦ	*{Rɻiŋ>Rɻuŋ} /SPOKEN	LEXPRIOR
☞	Φ: S+fLOC$_4$+Rɻiŋ$_1$+fLOC$_2$+{Ra>ø}$_3$			1
a.	Φ: S+fLOC$_4$+{Rɻiŋ>Rɻuŋ}$_1$+fLOC$_2$+{Ra>ø}$_3$		W$_1$	L

7.3.7 Constraint ranking in M→Φ

We have now completed the survey of the M→Φ grammar. The overall ranking of the constraints introduced above is presented in (7.91).

(7.91) Constraint ranking, M→Φ

Undominated:

{ LEXSTEM, MAX-MΦ, LIN-MΦ, MAX(DIAC),

*CV$_{\text{ROOT}}$+$_{\text{L/I}}$fOBL′, *C{$_{\text{R}}$a>ø}, *{$_{\text{R}}$ɻ̣iŋ>$_{\text{R}}$ɻ̣uŋ}/SPOKEN, *{$_{\text{R}}$ɻ̣i>$_{\text{R}}$ɻ̣u}/SPOKEN}

fABL′/fLOC′_ , fALL′/fLOC′_ , DEP-MΦ

LEX(μ)

LEX-MΦ

AGREE(coronal)/$C_{\mu1}C_{\mu2}$

LEXPRIOR

7.4 The architecture of Kayardild phonology and morphology

This final section offers an assessment in §7.4.1of the likelihood that a cyclic analysis of Kayardild morphology and phonology can be sustained in light of what has been discussed above, and in §7.4.2 a concluding observation regarding representational levels in morphology and phonology and the ways in which they are related.

7.4.1 Cyclicity

As discussed in Ch.4, §4.1, an assumption adopted in many theories of phonology and morphology, is that word formation and phonology are cyclically interleaved, with words constructed piece by morphological piece, and submitted to the phonology after each morphological operation has applied. In Chapter 4, arguments were provided to the effect that this view of phonology and morphology is difficult to sustain in Kayardild. Perhaps the most convincing was the existence of phonologically optimising allomorph selection in which the selection of an input allomorph was sensitive both to what preceded it, and to what followed it. If the phonology applies after the addition of each individual morph, then the phonologically optimising analysis of these particular instances of allomorphy cannot be sustained. As was argued in Ch.3, §3.14, it is certainly possible to construct an alternative analysis of the same phenomena in terms of phonological subcategorisation — and this analysis would be compatible with the cyclic view of morphology and phonology — but that alternative fails to capture the generalisations which the phonologically optimising analysis expresses, generalisations which do appear to be genuine facts about the language.

The purpose in this current section is to cast a wider net, and to examine the evidence from the $\Sigma \rightarrow M$ and $M \rightarrow \Phi$ grammars which bear on the question of morphological and phonological cyclicity. For the sake of the discussion, all evidence from the phonology which was identified in Ch.4 will be set aside, and since the $\Sigma \rightarrow M$ and $M \rightarrow \Phi$ grammars as they have been explored in this chapter relate primarily to inflection, we will concentrate on that.

If inflection is the empirical domain of interest, then a number of cyclic hypotheses could be entertained, depending on how many components of the grammar are entertained as being linked together in a cycle. The most far-reaching hypothesis would be that syntactic structure itself is built up cyclically. Morphosyntactic feature structures would be calculated for words based on just some portion of a sentence, then passed to the $\Sigma \rightarrow M$ grammar, to the $M \rightarrow \Phi$ grammar, and then to the phonology. A version of this hypothesis figures in recent Minimalist syntactic theory, where the operative notion is that of a **phase** (Chomsky 2000a; 2001): a section of syntactic structure, one of whose properties is that it is realised cyclically by the phonology. The prospects for this kind hypothesis turn out to be poor in Kayardild, as now follows.

Already in the output of the M→Φ grammar (i.e., before the phonology proper), fLOC and fOBL are realised cumulatively. This is significant, because fOBL is the realisation of COMP:plain, a feature which attaches to an S node, and fLOC realises, among other things CASE:loc, which can attach to a DP node at any depth of embedding. Since fLOC and fOBL are realised cumulatively, it follows that the realisational grammar will need to know whether or not the realisation of a CASE:locative feature is to be followed by the realisation of COMP:plain feature, and thus in the general case it needs to have visible to it the entire syntactic structure, from the node to which CASE:locative attaches (at any depth of embedding), all the way to the S nodes of the uppermost clause of the sentence, before it can realise the embedded CASE:locative feature. While this appears to present an immediate knock-down case against syntactico-phonological cyclicity, there is a counter-argument that could be mounted.

It has been assumed until now that the morph /$_{D}$kurka/ is truly a cumulative realisation of fLOC.fOBL. Suppose though, that we analyse $_{D}$kurka as compositional, consisting of the usual fLOC morph /$_{D}$ki/, plus a suppletive realisation of fOBL /urka/, with /kurka/ derived by some special kind of hiatus resolution /i+u/ → /u/. In this case, the argument presented above dissolves: a deeply embedded CASE:locative feature can be realised as /$_{D}$ki/ whether or not it is eventually followed by a realisation of COMP:plain (which is now understood to be /urka/ after /$_D$ki/). Notwithstanding the veracity of these observations, there are other difficulties for the syntactic cyclicity hypothesis.

In §7.2.5.1 above, it was discussed that the linear order of realisations of A-TAM and TH-TAM features which are associated with an embedded clause structure will be reversed if the feature associated with the lower clause is realised by fOBL. That is, if the lower clause feature is realised by fOBL, and the upper clause feature by *x*, then the order is not BASE-fOBL-*x* but BASE-*x*-fOBL. Now, if words are presumed to be built cyclically from the stem outward, then this fact appears to require that in the general case, features in a lower clause must wait until features in an upper clause are visible before being realised. If that is so, then the only kind of syntactico-phonological cyclicity which is possible in Kayardild, is one in which is not terribly interesting. Since the realisation of A-TAM and TH-TAM features must 'wait for' other features which might have attached to higher nodes in an entirely different clause, it will not be possible to submit a 'cycle' of syntactic structure to other components of the grammar until *all* nodes have been assembled, to which an A-TAM or TH-TAM might attach. Concretely, this means that the first 'cycle' will contain the entire sentence up to the first S node. Given that only one morphosyntactic feature *above* the first S node is ever realised in Kayardild, the kind of cyclicity we are discussing now is almost vacuous: just a single feature will be realised any later than the first cycle; while all other features are realised, all at once, on the first cycle. Before we conclude that this is indeed that case, and that syntactico-phonological cyclicity in Kayardild is essentially unviable, there is one more counter-analysis which must be rebutted.

It could be argued in cases where features are realised in the reverse order, as BASE-*x*-fOBL, that the *x* morph is added to the word as an infix; that is, one first builds BASE-fOBL, which is submitted to the Σ→M and M→Φ grammars and to the phonology, and only after that is *x* infixed on a later cycle, to yield BASE-*x*-fOBL. Technically this should be relatively straightforward to implement, with the use of a constraint which keeps fOBL anchored to the word's end. The analysis runs aground at the segmental level though, because fOBL, which underlyingly is /in̪t̪a/, has a surface form that is dependant on what precedes it. Suppose our BASE ends phonologically in /i/ and that *x* is fPROP, which ends in /u/. According to the infixing model, BASE+fOBL is submitted to the phonology first, in which case fOBL surfaces as /ɲca/: its initial /i/ vowel will be deleted, and its input laminal dental consonants /n̪t̪/ will be productively changed to laminal palatals /ɲc/ in the context of the preceding front vowel /i/, the final segment of the BASE. On the next cycle, we infix fPROP and submit the results to the phonology. In the phonology, input laminal palatal consonants are preserved unchanged, even after back vowels (Ch.4, §4.6), giving us the incorrect output *BASE-kuu-ɲca rather than the desired output, BASE-kuu-n̪t̪a. The infixing solution is not workable.

In sum, a far-reaching cyclic model which stretches from the syntax to the phonology is not supported in Kayardild, at least in any interesting form.

What about cyclic models with less depth? A model which realises morphosyntactic *feature values* cyclically, from inside a feature structure, runs into the same problems as the syntactic, cyclic model: sometimes, the order of feature values within the feature structure is not the order in the phonology, and as already discussed, a reanalysis in terms of infixation is not viable. Moving one step closer to the surface, is a model in which each *morphome* is submitted cyclically to the phonology. In this model, the starting point is the output of the Σ→M grammar, a string *S* of morphomes. Words are then built up morphome by morphome, according to the order of the elements in *S*, with the results of each cycle submitted to the M→Φ grammar and to the phonology. This model will sidestep the difficulties posed by the ordering of fOBL, since fOBL is already in its final linear position within *S*. Consequently, the model will succeed so long as we maintain the compositional analysis of /kurka/ mentioned above — an analysis which is predicated on a process of vowel hiatus /i+u/ → /u/, and on an allomorph /urka/ of fOBL, neither of which are attested anywhere else in the morphology and phonology of Kayardild, and for which there is consequently no genuine, independent motivation.

The final conclusion is that the case for any kind of cyclicity in Kayardild between pre-phonological levels of representation and the phonology itself is weak at best. As in the phonology, Kayardild presents itself as a language in which a complete packet of information about a word form must be available right from the outset, and in which all of that information is taken into account and realised within a single word-building cycle. As such, Kayardild will present a standing challenge to any theoretical framework in which cyclicity in taken to be an ineluctable aspect of word formation in all languages.

7.4.2 The relationships between levels of representation

In this chapter, the mappings between Σ and M level representations, and between M and Φ level representations have been formalised as two distinct grammars. The decision to do this follows primarily from considerations of space. It remains a question for future research though, whether the two grammars could be combined — not in the sense that mappings would proceed directly from Σ to Φ without an M level representation; this approach was soundly rejected in §7.1, but in the sense that a single grammar of ranked and violable constraints could act upon a complex representation in which correspondence relationship hold not just between elements in an input and an output, but between elements on three levels. Indeed the question of whether this general approach is viable — in which a single grammar regulates correspondences between multiple levels — is one which remains open with respect to the entirety of the Kayardild system of morphology and phonology. In Ch.4, §4.5.2 it was discussed that phonologically optimising allomorphy seems to require co-ordination between underlying phonological inputs and post-lexical outputs, yet also that aspects of Kayardild's segmental phonology strong motivate the positing of at least one intermediate level between these two. A single grammar which regulates correspondences between many levels simultaneously may well be what is needed in order to eventually resolve paradoxes of this kind. If nothing else then, the probing of Kayardild's morphology and phonology, conducted from a formal angle as has been the task of this dissertation, provides us with compelling questions which are to still be answered by linguists whose goal it is to describe and perhaps eventually explain, the phenomena we encounter in human language.

Appendix A Segmental phonology

This appendix provides a comprehensive exemplification of the modifications which apply in the segmental phonology, and which were listed, in summary form, at various points in Ch.4. Consonant cluster modifications are exemplified for the 'regular' phonology in §A.1, the 'deleting' phonology in §A.2 and the 'leniting' phonology in §A.3. Vowel hiatus resolution is exemplified in §A.4, and modifications to vowel–laminal sequences in §A.5. Some post-lexical modifications are noted in §A.6.

A.1 Consonant cluster modifications in the 'regular' phonology

Table (A.1) repeats (4.1) from Ch.4, §4.2.1.1, setting out for the regular phonology the modifications which apply to underlying consonant clusters which form across the boundary of adjacent morphs, m_1+m_2.

(A.1) Simplification of consonant clusters across boundaries of morphs m_1+m_2 in the ‘regular’ phonology of Kayardild

	Final string in m_1	Initial C in m_2										
		t,ʈ	n,ɳ	ɻ	t̪	c	k	p	ŋ	m	j	w
a.	V, Vŋ, Vk	(see h.,i.)		Vɻ	Vt̪	Vc	Vk	Vp	Vŋ	Vm	Vj	Vw
b.	r, rŋ, rk	ʈ	rn	l	rt̪	rc	rk	rp	rŋ	rm	rj	rw
c.	ɻ, ɻk	ɻʈ	ɻn	ɻ	ɻʈ̪	ɻc	ɻk	ɻp	ɻŋ	ɻm	ɻj	ɻw
d.	l, lŋ, lk	lt	ln	l	lt̪	lc	lk	lp	lŋ	lm	lj	lw
e.	ɳ	ɳʈ	ɳ	l	ɳʈ̪	ɳc	ɳk	ɳp	ɳŋ	ɳm		ɳm
f.	n, ɲ	nt	n	l	n̪t̪	ɲc	nk	np	nŋ	nm	ɲ	nm
g.	c, t̪	t	n	l	t̪	c	k	cp	ɲ	ɲm	j	j

	Final string in m_1	Initial C/V in m_2					
		ʈ	ɳ	n	r	l	i
h.	V	Vʈ	Vɳ	Vn	Vr	Vl	
i.	Vŋ, Vk	Vʈ	Vɳ				*

*see §A.4

The forms given in (A.3)–(A.17) provide specific examples corresponding to each filled cell in (A.1). Examples are arranged into sets in which forms ending in the same m_1-final sequence is followed by each attested, m_2-initial consonant. Clusters which are not attested (NA) are listed at the head of each set. The sets are summarised in (A.2).

(A.2)

Set	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10
m_1-final	ŋ	k	r	rŋ	rk	ɻ	ɻk	l
Set	A.11	A.12	A.13	A.14	A.15	A.16	A.17	
m_1-final	lŋ	lk	ɳ	n	ɲ	c	t̪	

For an example of the regular phonology applying to m_1+m_2 in which m_2 begins with a vowel, see (A.31) below.

(A.3) 'Regular' phonology /ŋ+C/

NA: ŋ-j

a. *kurndu-rdangka-wuru-*
ŋ-ʈ /kunʈuʈaŋkauɻu-/
/kunʈuŋ-ʈaŋka-kuɻu-/
chest-person-fPROP-
'having a person on one's chest'

b. *kurndu-rnurru-*
ŋ-ɳ /kunʈuɳuru-/
/kunʈuŋ-ɳuru-/
chest-fASSOC-
'mother of suckling child'

c. *thathu-ru-th-*
ŋ-ɻ /t̪at̪uɻu-t̪-/
/t̪at̪uŋ-ɻu-t̪-/
together-fFACT-TH
'put OBJ together'

d. *kurndu-thaldi-j-*
ŋ-t̪ /kunʈut̪alti-c-/
/kunʈuŋ-t̪alti-c-/
chest-stand-TH-
'be chest-upward'

e. *thuru-jungarra-*
ŋ-c /t̪uɻucuŋara-/
/t̪uɻuŋ-cuŋara-/
cold-big-
'heavy cold (illness)'

f. *kurndu-kurri-j-*
ŋ-k /kunʈukuri-c-/
/kunʈuŋ-kuri-c-/
chest-look-TH
'look hard'

g. *kurndu-birdi-*
ŋ-p /kunʈupiʈi-/
/kunʈuŋ-piʈi-/
chest-bad-
'having a bad chest'

h. *wija-nguni-*
ŋ-ŋ /wicaŋuni-/
/wicaŋ-ŋuni-/
hiding place-fINST-
'in a hiding place'

i. *wija-maru-th-*
ŋ-m /wicamaɻu-t̪-/
/wicaŋ-maɻu-t̪-/
hiding pl.-fDAT-TH-
'put into hiding'

j. *wumpuru-warri-*
ŋ-ŋ /wumpuɻuwari-/
/wumpuɻuŋ-wari-/
spear-fPRIV-
'spear.PRIV'

(A.4) 'Regular' phonology /k+C/

NA: k-ɻ k-t̪ k-c k-k k-m

a. *ngungu-rdingkarr-*
k-ʈ /ŋuŋuʈiŋkar-/
/ŋuŋuk-ʈiŋkar-/
story-long-
'long winded'

b. *ma-rnurru-*
k-ɳ /maɳuru-/
/mak-ɳuru-/
torch-fASSOC-
'torch-ASSOC'

c. *ngungu-birdi*
k-p /ŋuŋupiʈi-/
/ŋuŋuk-piʈi-/
story-bad-
'lie'

d. *ma-nguni-*
k-ŋ /maŋuni-/
/mak-ŋuni-/
torch-fINST-
'torch-INST'

e. *wa-yulmpurr-*
k-j /wajulmpur-/
/wak-julmpur-/
call-long-
'long call'

f. *ri-warri-*
k-w /ɻiwari-/
/ɻik-wari-/
cry-fPRIV-
'cry-fPRIV'

(A.5) 'Regular' phonology /r+C/

a. *bijuu-rdiya--n-*
r-ʈ /picuːʈian-/
/picuːr-ʈia-c-n-/
cockle-eat-TH-fN-
'cockle-eater'

b. *wunkurr-nurru-*
r-ɳ /wunkurnuru-/
/wunkur-ŋuru-/
grass shelter-fASSOC-
'grass shelter-ASSOC'

c. *dingka-lu-th-*
r-ɻ /ʈiŋkalut̪-/
/ʈiŋkar-ɻu-t̪-/
long-fFACT-TH
'elongate OBJ'

d. *nguyarr-thalkuru-*
r-t̪ /ŋujart̪alkuɻu-/
/ŋujar-t̪alkuɻu/
foreskin-fLADEN-
'carrying a foreskin'

e. *thawurr-jungarra-*
r-c /t̪aurcuŋara-/
/t̪uɻuŋ-cuŋara-/
throat-big-
'loud voiced'

f. *wunkurr-karrany-*
r-k /wunkurkaraɲ-/
/wunkur-karaɲ-/
grass-fGEN-
'on the grass'

g. *munirr-bardangu-*
r-p /munirpaʈaŋu-/
/munir-paʈaŋu-/
breast-large-
'large-breasted'

h. *kamarr-ngudi--n-*
r-ŋ /kamarŋutin-/
/kamar-ŋuti-c-n-/
stone-throw-TH-fN-
'stone-thrower'

i. *bantharr-marra-*
r-m /pan̪t̪armara-/
/pan̪t̪ar-mara-/
others-fUTIL-
'others-UTIL'

j. *thawurr-yulmburr-*
r-j /t̪aurjulmpur-/
/t̪aur-julmpur-/
throat-long-
'long-necked'

k. *minbarr-warri-*
r-w /minparwari-/
/minpar-wari-/
wound-fPRIV-
'unscathed'

(A.6) ‘Regular’ phonology /rŋ+C/

NA: rŋ-ʈ rŋ-t̪ rŋ-c rŋ-k rŋ-ŋ rŋ-j

a.	*kiyarr-nurru-*	b.	*kiya-lu-th-*	c.	*kiyarr-barji--n-*
rŋ-ɳ	/kiarnuru-/	rŋ-ɻ	/kialut̪-/	rŋ-p	/kiarpaɻcin-/
	/kiarŋ-ɳuru-/		/kiarŋ-ɻu-t̪-/		/kiarŋ-paɻci-c-n-/
	two-fASSOC-		two-fFACT-TH		two-be born-TH-fN-
	‘two-ASSOC’		‘duplicate OBJ’		‘twins’
d.	*kiyarr-marii--j-*	e.	*kiyarr-wu-j-*		
rŋ-m	/kiarmaɻiic-/	rŋ-w	/kiarwuc-/		
	/kiarŋ-maɻu-i-t̪-/		/kiarŋ-wu-c-/		
	two-fDAT-fMID-TH-		two-fDON-TH-		
	‘do together’		‘two-DON-ø’		

(A.7) ‘Regular’ phonology /rk+C/

NA: rk-ɳ rk-j

a.	*kantha-rdiya--n-*	b.	*kantha-la-th-*	c.	*rirr-thalkuru-*
rk-ʈ	/kan̪t̪aʈian-/	rk-ɻ	/kan̪t̪alat̪-/	rk-t̪	/ɻirt̪alkuɻu-/
	/kan̪t̪ark-ʈia-c-n-/		/kan̪t̪ark-ɻa-t̪-/		/ɻirk-t̪alkuɻu-/
	alone-eat-TH-fN-		alone-fRATH-TH-		grease-fLADEN-
	‘one who eats alone’		‘be lacking OBJ’		‘grease-besmirched’
d.	*kirr-jungarra-*	e.	*mijurr-karii---n-*	f.	*kirr-bu-yii-j-*
rk-c	/kircuŋara-/	rk-k	/micurkaɻiːn-/	rk-p	/kirpuiːc-/
	/kirk-cuŋara-/		/micurk-kaɻi-i-c-n-/		/kirk-puː-i-c-/
	nose-big-		tear-cover-fMID-TH-fN-		nose-pull-fMID-TH-
	‘big-nosed’		‘tear-streaked’		‘blow one’s nose’
g.	*rirr-nguni-*	h.	*kirr-maku-*	i.	*kantharr-wirndi--n-*
rk-ŋ	/ɻirŋuni-/	rk-m	/kirmaku-/	rk-w	/kan̪t̪arwiʈin-/
	/ɻirk-ŋuni-/		/kirk-maku-/		/kan̪t̪ark-wiʈi-c-n-/
	grease-fINST-		nose-woman-		alone-stay-TH-fN-
	‘grease-INST’		‘feminine-faced’		‘staying alone’

(A.8) ‘Regular’ phonology /ɻ+C/

NA: ɻ-ɳ ɻ-j

a.	*marl-dingkarr-*	b.	*mibu-raa-j-irriny-*	c.	*mar-thungal-uru-*
ɻ-ʈ	/maɭʈiŋkar-/ /maɻ-ʈiŋkar-/ hand-long- ‘long-handed’	ɻ-ɻ	/mipuɻaːciriɲ-/ /mipuɻ-ɻaː-c-iriɲ-/ eye-spear-TH-fRES- ‘speared in the eye’	ɻ-t̪	/maɭt̪uŋaluɻu/ /maɻ-t̪uŋal-kuɻu/ hand-thing-fPROP ‘having something in one’s hand’
d.	*dangur-janii--j-*	e.	*mar-kuu-c-*	f.	*dur-barrbarr-*
ɻ-t̪	/ʈaŋuɻcaniː-c-/ /ʈaŋuɻ-cani-i-c-/ crab-‹fHALL-fMID›-TH- ‘crab-‹PURP›-Ø’	ɻ-k	/maɻkuː-c-/ /maɻ-kuː-c-/ hand-bathe-TH- ‘be sick’[1]	ɻ-p	/ʈuɻparpar-/ /ʈuɻ-par~par-/ faeces-soft$_{NL}$-soft$_{NL}$ ‘suffering diarrhoea’
g.	*mar-ngudii--j-*	h.	*mibur-muthany-*	i.	*mibur-wulaa--j-*
ɻ-ŋ	/maɻŋutiː-c-/ /maɻ-ŋuti-i-c-/ hand-throw-fMID-TH- ‘wave’	ɻ-m	/mipuɻmut̪aɲ-/ /mipuɻ-mut̪aɲ-/ eye-fEXS- ‘lecher’	ɻ-w	/mipuɻwulaː-c-/ /mipuɻ-wula-i-t̪-/ eye-‹fOABL-fMID›-TH- ‘eye-‹SABL›-Ø’

(A.9) ‘Regular’ phonology /ɻk+C/

NA: ɻk-ʈ ɻk-ɻ ɻk-t̪ ɻk-c ɻk-k ɻk-p ɻk-ŋ ɻk-m ɻk-j

a.	*yarl-nurru-*	b.	*yar-maru-th-*	c.	*yar-waany-*
ɻk-ɳ	/jaɻɳuru-/ /jaɻk-ɳuru-/ below-fASSOC- ‘below-ASSOC’	ɻk-m	/jaɻmaɻut̪-/ /jaɻk-maɻu-t̪-/ below-fDAT-TH- ‘below-DAT-ø’	ɻk-w	/jaɻwaːɲ-/ /jaɻk-waːɲ-/ below-fORIG- ‘below-ORIG’

[1] This refers to suffering a specific illness, believed to be acquired through the improper mixing of land-based food with the sea, and proto-typically induced by washing one’s fatty hands in the sea.

(A.10) 'Regular' phonology /l+C/

a. l-ʈ	*marral-dunbu-* /maraltunpu-/ /maral-ʈunpu-/ ear-deaf- 'deaf'	b. l-ɳ	*wirril-nurru-* /wirilnuru-/ /wiril-ɳuru-/ leaf-fASSOC- 'leaf-ASSOC'	c. l-ɻ	*miji-laa--n-* /micilaːn-/ /micil-ɻaː-c-n-/ net-sew-TH-fN- 'net-sewer'
d. l-t̪	*kirdil-thungal-uru-* /kiʈilt̪uŋaluɻu-/ /kiʈil-t̪uŋal-kuɻu-/ back-thing-fPROP- 'having something on one's back'	e. l-c	*thungal-janii--c-* /t̪uŋalcaniː-c-/ /t̪uŋal-cani-i-c-/ thing-‹fHALL-fMID›-TH- 'thing-‹PURP›-ø'	f. l-k	*kirdil-kuriyala--n-* /kiʈilkuɻialan-/ /kiʈil-kuɻiala-t̪-n-/ back-be bunched-TH-fN 'hunch back'
g. l-p	*nal-birdi-* /ɳalpiʈi-/ /ɳal-piʈi-/ head-bad 'crazy'	h. l-ŋ	*dakal-nguni-* /ʈakalŋuni-/ /ʈakal-ŋuni-/ pounder-fINST- 'pounder-INST'	i. l-m	*kubul-muthany-* /kupulmut̪aɲ-/ /kupul-mut̪aɲ-/ hair-fEXS- 'extremely hairy'
j. l-j	*nal-yulmburr-* /ɳaljulmpur-/ /ɳal-julmpur-/ head-long- 'long-headed'	k. l-w	*mijil-wula-th-* /micilwulat̪-/ /micil-wula-t̪-/ net-fOABL-TH- 'net-OABL-ø'		

(A.11) 'Regular' phonology /lŋ+C/

NA: lŋ-ʈ lŋ-ɳ lŋ-ɻ lŋ-t̪ lŋ-c lŋ-k lŋ-p lŋ-ŋ lŋ-m lŋ-j lŋ-w

a. lŋ-m	*kurdalal-marra-* /kuʈalalmara-/ /kuʈalalŋ-mara-/ stingray-fUTIL- 'stingray-UTIL'

(A.12) ‘Regular’ phonology /lk+C/

NA: lk-ʈ lk-j

a.	*wangal-nurru-*	b.	*marda-la-th-*	c.	*dul-thalkuru-*
lk-ɳ	/waŋalnuru-/	lk-ɻ	/maʈala-t̪-/	lk-t̪	/ʈult̪alkuɻu-/
	/waŋalk-ɳuru-/		/maʈalk-ɻa-t̪-/		/ʈulk-t̪alkuɻu-/
	boomerang-fASSOC-		mud-fRATH-TH-		dirt-fLADEN-
	‘boomerang-ASSOC’		‘paint OBJ’		‘dirt-besmirched’
d.	*birrjil-jungarra-*	e.	*mardal-karii---n-*	f.	*mibul-barrwaa-j-*
lk-c	/pircilcuŋara/	lk-k	/maʈalkaɻiːn-/	lk-p	/mipulparwaːc-/
	/pircilk-cuŋara-/		/maʈalk-kaɻi-i-c-n-/		/mipulk-parwaː-c-/
	step-big-		mud-cover-fMID-TH-fN-		asleep-block-TH-
	‘fast walker’		‘mud-covered’		‘keep from sleeping’
g.	*wangal-ngudi-n-*	h.	*birrjil-muthany-*	i.	*wangal-warri-*
lk-ŋ	/waŋalŋutin-/	lk-m	/pircilmut̪aɲ/	lk-w	/waŋalwari-/
	/waŋalk-ŋuti-c-n-/		/pircilk-mut̪aɲ-/		/waŋalk-wari-/
	b.-throw-TH-fN-		step-fEXS-		boomerang-fPRIV-
	‘boomerang thrower’		‘excessive wanderer’		‘boomerang-PRIV’

(A.13) ‘Regular’ phonology /ɳ+C/

NA: ɳ-j

a.	*durn-durn-*	b.	*nga-rnurru-*	c.	*jampa-lu-th-*
ɳ-ʈ	/ʈuɳʈuɳ-/	ɳ-ɳ	/ŋaɳuru-/	ɳ-ɻ	/campalut̪-/
	/ʈuɳ-ʈuɳ-/		/ŋaɳ-ɳuru-/		/campaɳ-ɻu-t̪-/
	big$_{\text{NL}}$-big$_{\text{NL}}$		beach-fASSOC-		hollow-fFACT-TH-
	‘big’		‘beach-ASSOC’		‘hollow out OBJ’
d.	*Bingkurn-thulaa--n-*	e.	*bingkurn-janii--c-*	f.	*kirn-kirn-*
ɳ-t̪	/piŋkuɳt̪ulaːn-/	ɳ-c	/piŋkuɳcaniː-c-/	ɳ-k	/kiɳkiɳ-/
	/piŋkuɳ-t̪ula-i-t̪-n-/		/piŋkuɳ-cani-i-c-/		/kiɳ-kiɳ-/
	crab-descend-fMID-TH-fN-		crab-‹fHALL-fMID›-TH-		on top$_{\text{NL}}$-on top$_{\text{NL}}$
	(Place name)		‘crab-‹PURP›-ø’		‘on top’

g. *barn-barn-*
ɳ-p /paɳpaɳ-/
/paɳ-paɳ-/
crab$_{NL}$-crab$_{NL}$-
‘crab sp.’

h. *Walbarn-ngathi-*
ɳ-ŋ /walpaɳŋat̪i-/
/walpaɳ-ŋat̪i-/
Place name-fBORN-
(Name)

i. *ngarn-maru-th-*
ɳ-m /ŋaɳmaɻu-t̪-/
/ŋaɳ-maɻu-t̪-/
beach-fDAT-TH-
‘beach-DAT-ø’

j. *ngarn-mulaa--j-*
ɳ-j /ŋaɳmulaː-c-/
/ŋaɳ-wula-i-t̪-/
beach-‹fOABL-fMID›-TH-
‘net-‹SABL›-ø’

(A.14) ‘Regular’ phonology /n+C/

a. *wuran-diya--n-*
n-ʈ /wuɻantian-/
/wuɻan-tia-c-n-/
food-eat-TH-fN-
‘food-eater’

b. *dathi-nurru-*
n-ɳ /ʈat̪inuru-/
/ʈat̪in-ɳuru-/
there-fASSOC-
‘there-ASSOC’

c. *bali-lu-th-*
n-ɻ /palilut̪-/
/palin-ɻu-t̪-/
naked-fFACT-TH-
‘expose OBJ’

d. *mun-thaldi--n-*
n-t̪ /mun̪t̪altin-/
/mun-t̪alti-c-n-/
bottom-stand-TH-fN-
‘bottom-up’

e. *wuran-janii--c-*
n-c /wuɻaɲcaniː-c-/
/wuɻan-cani-i-c-/
food-‹fHALL-fMID›-TH-
‘food-‹PURP›-ø’

f. *birdin-kurri-j-*
n-k /piʈinkuri-c-/
/piʈin-kuri-c-/
mis$_{NL}$-see-TH-
‘mis-see’

g. *thukan-bardangu-*
n-p /t̪ukanpaʈaŋu-/
/t̪ukan-paʈaŋu-/
beard-large
‘full-bearded’

h. *dathin-nguni-*
n-ŋ /ʈat̪inŋuni-/
/ʈat̪in-ŋuni-/
that-fINST-
‘that-INST’

i. *wun-marra-*
n-m /wunmara-/
/wun-mara-/
rain-fUTIL-
‘rain-UTIL’

j. *thuka-nyulmburr-*
n-j /t̪ukaɲulmpur-/
/t̪ukan-julmpur-/
beard-long-
‘long-bearded’

k. *daman-marri-*
n-w /ʈamanmari-/
/ʈaman-wari-/
tooth-fPRIV-
‘tooth-PRIV’

(A.15) ‘Regular’ phonology /ɲ+C/

a. *ngij-in-dangka-bala-n-*
ɲ-ʈ /ŋicintaŋkapalan-/
/ŋicu-iɲ-ʈaŋka-pala-c-n-/
1sg-fPOSS-person-kill-TH-fN-
‘killer of my people’

b. *bi-lu-wa-nurru-*
ɲ-ɳ /piluwanuru-/
/pi-lu-paɲ-ɳuru-/
3-pl-fPOSS-fASSOC-
‘3-pl-ø-ASSOC’

c. *ni-wa-lu-th-*
ɲ-ɻ /ɳiwalut̪-/
/ɳi-paɲ-ɻu-t̪-/
3-fPOSS-fFACT-TH-
‘take OBJ as his’

d. *ngij-in-thuu-j-arrba-*
ɲ-t̪ /ŋicin̪t̪uːcarpa-/
/ŋicu-iɲ-t̪uː-c-ŋarpa-/
1sg-fPOSS-insult-TH-fCONS-
‘one who insulted me’

e. *ngum-ban-jani-j-*
ɲ-c /ŋumpaɲcani-c-/
/ŋuŋ-paɲ-cani-c-/
2sg-fPOSS-fHALL-TH-
‘2sg-ø-HALL-ø’

f. *kalangin-kalangin-*
ɲ-k /kalaŋinkalaŋiɲ-/
/kalaŋiɲ-kalaŋiɲ-/
worn-worn-
‘very worn out’

g. *duujin-barda-*
ɲ-p /ʈuːcinpaʈa-/
/ʈuːciɲ-paʈa-/
y.Br-fDEAR-
‘brother dear’

h. *duujin-ngarrba-*
ɲ-ŋ /ʈuːcinŋarpa-/
/ʈuːciɲ-ŋarpa-/
y.Br-fDYAD-
‘brother dyad’

i. *kuwan-marra-*
ɲ-m /kuanmara-/
/kuaɲ-mara-/
firestick-fUTIL-
‘firestick-UTIL’

j. *kala-th-irri-nyarrath-*
ɲ-j /kalat̪iriɲarat̪-/
/kala-t̪-iriɲ-jarat̪-/
cut-TH-fRES-fANOTH-
‘another initiated man’

k. *duujin-marri-*
ɲ-w /ʈuːcinmari-/
/ʈuːciɲ-wari-/
y.Br-fPRIV-
‘y.Br-PRIV’

(A.16) ‘Regular’ phonology /c+C/

a. *ngi-darri-j-*
c-ʈ /ŋitari-c-/
/ŋic-tari-c-/
wood-trample-TH-
‘look for firewood’

b. *mii-nurru-*
c-ɳ /miːnuru-/
/miːc-ɳuru-/
louse-fASSOC-
‘louse-ASSOC’

c. *warngi-lu-th-*
c-ɻ /waɻŋilut̪-/
/waɻŋic-ɻu-t̪-/
one-fFACT-TH-
‘mix OBJ’

d. *ngi-thalkuru-*
c-t̪ /ŋit̪alkuɻu-/
/ŋic-t̪alkuɻu-/
fire-fLADEN-
‘hot’

e. *ngi-janii--c-*
c-c /ŋicaniː-c-/
/ŋic-cani-i-c-/
wood-‹fHALL-fMID›-TH-
‘wood-‹PURP›-ø’

f. *biriij-biriij-*
c-p /piɻiːcpiɻiːc-/
/piɻiːc-piɻiːc-/
father-father
‘fathers’

g. *ngi-nyuni-*
c-ŋ /ŋiɲuni-/
/ŋic-ŋuni-/
wood-fINST-
'wood-INST'

h. *warnginy-marra-*
c-m /waɻŋiɲmara-/
/waɻŋic-mara-/
one-fUTIL-
'one-UTIL'

i. *mii-yarri-*
c-w /miːjari-/
/miːc-wari-/
tooth-fPRIV-
'tooth-PRIV'

j. *yurrurri--yurrurr-j-*
c-j /jururijururi-c-/
/jururi-c-jururi-c-/
swear at-TH-swear at-TH-
'swear at'

k. *kam-buri--kam-buri-j-*
c-k /kampuɻikampuɻi-c-/
/kaŋ-puɻi-c-kaŋ-puɻi-c-/
speech-ROOT$_{NL}$-TH-speech-ROOT$_{NL}$-TH-
'talk'

(A.17) 'Regular' phonology /t̪+C/
NA: t̪-ʈ t̪-t̪ t̪-j

a. *yarbu-nurru-*
t̪-ɳ /jaɻpunuru-/
/jaɻput̪-ɳuru-/
there-fASSOC-
'there-ASSOC'

b. *maka--lu-th-*
t̪-ɻ /makalut̪-/
/maka-t̪-ɻu-t̪-/
rest-TH-fFACT-TH-
'make OBJ rest'

c. *-wala-jani-i-j-*
t̪-c /-walacaniːc-/
/palat̪-cani-i-c-/
fPL-‹fHALL-fMID›-TH-
'-PL-‹PURP›-ø'

d. *yarbu-karrany-*
t̪-k /jaɻpukaraɲ-/
/jaɻput̪-karaɲ-/
animal-fGEN-
'animal-GEN'

e. *yarbuj-burldi--n-*
t̪-p /jaɻpucpuɻʈin-/
/jaɻput̪-puɻʈi-c-n-/
animal-hit-TH-fN-
'animal-hitter'

f. *yarbu-nyarrba*
t̪-ŋ /jaɻpuɲarpa-/
/jaɻput̪-ŋarpa-/
animal-fCONS-
'animal-CONS'

g. *marrkany-marrkath-*
t̪-m /markaɲmarkat̪-/
/markat̪-markat̪-/
soft$_{NL}$-soft$_{NL}$-
'soft'

h. *yarbu-yarri-*
t̪-w /jaɻpujari-/
/jaɻput̪-wari-/
animal-fPRIV-
'animal-PRIV'

A.2 Consonant cluster modifications in the ‘deleting’ phonology

Table (A.18) repeats (4.4) from Ch.4, §4.2.1.2, setting out for the deleting phonology the modifications which apply to underlying consonant clusters which form across the boundary of adjacent morphs, m_1+m_2.

(A.18) Simplification of consonant clusters across boundaries of morphs m_1+m_2 in the ‘deleting’ phonology of Kayardild

	Final string in m_1	Initial C in m_2: k	w		Final string in m_1	Initial C in m_2: k	ŋ	j	w
a.	V	V		i.	lk	lk			
b.	r	r		j.	ɳ	ɳk			
c.	ɻ	ɻ		k.	n	nk			
d.	l	l	l	l.	ɲ	ɲc			
e.	rŋ	rŋk		m.	ŋ	ŋk			ŋ
f.	lŋ	lŋk		n.	c	c	c	c	c
g.	rk	rk		o.	t̪	t̪	t̪		t̪
h.	ɻk	ɻk		p.	k	k			

The forms in (A.19) provide specific examples corresponding to each filled cell in (A.18).

(A.19) ‘Deleting’ phonology

a. *dangka-wuru*
a-k /ʈaŋkauɻu-/
/ʈaŋka-kuɻu-/
man-fPROP
‘man-PROP’

b. *maku-wuru*
u-k /makuuɻu-/
/maku-kuɻu-/
woman-fPROP
‘woman-PROP’

c. *birdi-wuru*
i-k /pit̪iuɻu-/
/pit̪i-kuɻu-/
bad-fPROP
‘bad-PROP’

d. *kulurr-ulurr-*
r-k /kulurulur-/
/kulur-kulur-/
intestine$_{NL}$-intestine$_{NL}$
‘intestine’

e. *mibur-uru-*
ɻ-k /mipuɻuɻu-/
/mipuɻ-kuɻu-/
seed-fPROP-
‘bearing seeds’

f. *kubul-ubul-*
l-k /kupulupul-/
/kupul-kupul-/
hair-hair-
‘hairy caterpillar’

g. *wambal-ambal-*
l-w /wampalampal-/
/wampal-wampal-/
bush-bush-
‘sparse scrub’

h. *kiyarrngk-uru-*
rŋ-k /kiarŋkuɻu-/
/kiarŋk-kuɻu-/
two-fPROP-
‘two-PROP’

i. *kurdalalng-ka*
lŋ-k /kuʈalalŋka/
/kuʈalalŋ-ka/
stingray-T
‘stingray-ø’

j. *kantharrk-uru-*
rk-k /kan̪t̪arkuɻu-/
/kan̪t̪ark-kuɻu-/
alone-fPROP-
‘unassisted’

k. *yark-a*
ɻk-k /jaɻka/
/jaɻk-ka/
below-T
‘below-ø’

l. *mibulk-uru-*
lk-k /mipulkuɻu-/
/mipulk-kuɻu-/
asleep-fPROP-
‘sleepy’

m. *ngarn-kuru-*
ɳ-k /ŋaɳkuɻu-/
/ŋaɳ-kuɻu-/
sand-fPROP-
‘sandy’

n. *diyaa--n-kuru-*
n-k /ʈia:nkuɻu-/
/ʈia-i-c-n-kuɻu-/
eat-fMID-TH-fN-fPROP-
‘edible’

o. *natha-kambin-juru-*
ɲ-k /ɳat̪akampiɲcuɻu-/
/ɳat̪a-kampiɲ-kuɻu-/
camp-child-fPROP-
‘son-in-law’

p. *nying-ka*
ŋ-k /ɲiŋka/
/ɲiŋ-ka/
2sg-T
‘you (sg)’

q. *wulthung-a-th-*
ŋ-w /wul̪t̪uŋa-t̪-/
/wul̪t̪uŋ-wa-t̪-/
prostrate-fINCH-TH-
‘lie prostrate’

r. *kinaa-j-inaa-j-*
c-k /kina:cina:-c-/
/kina:-c-ina:-c-/
show-TH-show-TH-
‘show’

s. *warra-j-arra-*
c-ŋ /waracara-/
/wara-c-ŋara-/
go-TH-fCONS-
‘go-ø-PST’

t. *junk-iij-arrath-*
c-j /cunki:carat̪-/
/cunku-i:c-jarat̪-/
straight-fCONT-fANOTH
‘in return’

u. *kinaa-j-arri-*
c-w /kina:cari-/
/kina:-c-wari-/
show-TH-fPRIV-
‘show-ø-NEG.ACT’

v. *bala-th-uu-*
t̪-k /palat̪uu-/
/pala-t̪-kuu-/
hit-TH-fPROP-
‘hit-ø-POT’

w. *bath-urrnga-*
t̪-ŋ /pat̪urŋa-/
/pat̪-urŋa-/
west-fBOUND-
‘W. across a boundary’

x. *wu-th-u-nthu-th-*
t̪-w /wut̪un̪t̪u-t̪-/
/wu-t̪-wu-n̪t̪u-t̪-/
give-TH-give-fRCP-TH
‘give.RCP’

A.3 Consonant cluster modifications in the 'leniting' phonology

Tables (A.20) and (A.21) repeat (4.5) and (4.6) from Ch.4, §4.2.1.3, setting out for the leniting phonology the modifications which apply to underlying consonant clusters which form across the boundary of adjacent morphs, m_1+m_2.

(A.20) Simplification of consonant clusters across boundaries of morphs m_1+m_2 in the 'leniting' phonology of Kayardild, where m_2 is consonant initial

	Final string	Initial C in m_2											
	in m_1	ʈ	ɳ	ɻ	t̪	c	k	p	ɲ	ŋ	m	j	w
a.	V, Vk	Vɻ			Vj	Vj		Vw					
b.	r, rk					rj		rw					
c.	ɻ, rk							ɻw					
d.	l, lk							lw					
e.	rŋ												
f.	lŋ												
g.	ɳ							ɳp					
h.	n, ɲ							np					
i.	ŋ	ɳʈ				ɲc	ŋk	mp			m	j	w
j.	c							cp	ɲ				
k.	t̪	t	n	l		c		cp	n̪	nŋ	nm		j

(A.21) Simplification of consonant clusters across boundaries of morphs m_1+m_2 in the 'leniting' phonology of Kayardild, where m_2 is /i/-initial

Final C(C) in m_1	V	r	rŋ	rk	ɻ	ɻk	l	lŋ	lk	ɳ	n,ɲ	ŋ	c	t̪	k
+ inital /i/ in m_2	*	ri	rŋi	rki	ɻi	ɻki	li		lki	ɳi	ni	ŋi	ci	t̪i	ki

*see §A.4

The forms in (A.22) and (A.23) provide specific examples corresponding to each filled cell in (A.20) and (A.21). For instances involving vowel hiatus, see §A.4.

(A.22) ‘Leniting’ phonology /Seg+C/

a. V-ʈ	*dunbu-runbu-* /ʈunpuɻunpu-/ /ʈunpu-ʈunpu-/ deaf-deaf ‘uselss’	b. V-t̪	*thurdaki-yurdaki-* /t̪uʈakijuʈaki-/ /t̪uʈaki-t̪uʈaki-/ fish sp.NL-fish sp.NL - ‘fish sp.’	c. V-c	*junku-yunku-* /cunkujunku-/ /cunku-cunku-/ straight-straight- ‘in return-PL’
d. r-c	*juurr-yuurr-* /cuːrjuːr-/ /cuːr-cuːr-/ grassh.NL-grassh.NL ‘grasshopper sp.’	e. r-p	*balarr-walarr-* /palarwalar-/ /palar-palar-/ white-white- ‘egg white’	f. rk-p	*kantharr-walath-* /kan̪t̪arwalat̪-/ /kan̪t̪ark-palat̪-/ alone-fPL- ‘alone-PL’
g. l-p	*ki-l-wany-* /kilwaɲ-/ /ki-l-paɲ-/ 2-pl-fPOSS- ‘2-pl-POSS’	h. n-p	*bithiin-balath-* /pit̪iːnpalat̪-/ /pit̪iːn-palat̪-/ man-fPL- ‘man-PL’	i. ɲ-p	*duujin-balath-* /ʈuːcinpalat̪-/ /ʈuːciɲ-palat̪-/ y.Br-fPL- ‘y.Br-PL’
j. ŋ-ʈ	*karn-dingkarr-* /kanʈiŋkar-/ /kaŋ-ʈiŋkar-/ speech-long- ‘long-winded’	k. ŋ-c	*kan-jungarra-* /kaɲcuŋara-/ /kaŋ-cuŋara-/ speech-big- ‘loud-voiced’	l. ŋ-k	*kang-kunya-* /kaŋkuɲa-/ /kaŋ-kuɲa-/ speech-small- ‘soft-voiced’
m. ŋ-p	*wijam-balath-* /wicampalat̪-/ /wicaŋ-palat̪-/ hiding place-fPL- ‘hiding place-PL’	n. ŋ-p	*kam-bardangu-* /kampaʈaŋu -/ /kaŋ-paʈaŋu-/ speech-large ‘loud-voiced’	o. ŋ-m	*ka-muthany-* /kamut̪aɲ-/ /kaŋ-mut̪aɲ-/ speech-fEXS- ‘chatterbox’
p. ŋ-j	*Ka-yardil-* /kajaʈil-/ /kaŋ-jaʈil-/ speech-strong- ‘Kayardild’	q. ŋ-w	*ka-wu-j-* /kawuc-/ /kaŋ-wu-c-/ speech-fDON-TH- ‘talk to’	r. c-p	*biriij-balath-* /piɻiːcpalat̪-/ /piɻiːc-palat̪-/ father-fPL- ‘father-PL’

s.	*kurri--nyarra-*	t.	*ni-ta*	u.	*ba-nurru-*
c-ɲ	/kuriɲara-/	t̪-t	/ɳita-/	t̪-ɳ	/panuru-/
	/kuri-c-ɲara-/		/ɳit̪-ta/		/pat̪-ɳuru-/
	see-TH-fAPPR-		name-T		west-fASSOC-
	‘see-ø-APPR’		‘name’		‘west-assoc’
v.	*ni-la-tha*	w.	*bu-jinka-j-*	x.	*yuuj-bany-*
t̪-ɻ	/ɳila-t̪a/	t̪-c	/pucinkac-/	t̪-p	/juːcpaɲ-/
	/ɳit̪-ɻa-t̪a/		/put̪-cinka-c-/		/juːc-paɲ-/
	name-fRATH-TH.T		behind-follow-TH-		ahead-fPOSS-
	‘call by name’		‘follow’		‘old-time’
y.	*bala--nharra-*	z.	*bin-ngarrba-*	aa.	*ban-mali-*
t̪-ɲ	/palan̪ara-/	t̪-ŋ	/pin-ŋarpa-/	t̪-m	/panmali-/
	/pala-t̪-ɲara-/		/pit̪-ŋarpa-/		/pat̪-mali-/
	hit-TH-fAPPR-		smell-fCONS-		west-fHAIL-
	‘hit-ø-APPR’		‘smell-CONS’		‘hey you in the west’
ab.	*ba-ya-th-*				
t̪-w	/pajat̪-/				
	/pat̪-wa-t̪-/				
	west-fINCH-TH-				
	‘move to the west’				

(A.23) ‘Leniting’ phonology /C+i/

a.	*kamarr-inja-*	b.	*kiyarrng-inja-*	c.	*birrk-inja-*
r-i	/kamariɲca-/	rŋ-i	/kiarŋiɲca-/	rk-i	/pirkiɲca-/
	/kamar-in̪t̪a-/		/kiarŋ-in̪t̪a-/		/pirk-in̪t̪a-/
	stone-fOBL		two-fOBL		string-fOBL
	‘stone-CONT’		‘two-CONT’		‘string-CONT’
d.	*mar-inja-*	e.	*yark-inja-*	f.	*kirdil-inja-*
ɻ-i	/maɻiɲca-/	ɻk-i	/jaɻkiɲca-/	l-i	/kiʈiliɲca-/
	/maɻ-in̪t̪a-/		/jaɻk-in̪t̪a-/		/kiʈil-in̪t̪a-/
	hand-fOBL		below-fOBL		back-fOBL
	‘hand-CONT’		‘below-CONT’		‘back-CONT’

g.	*wangalk-inja-*	h.	*ngarn-inja-*	i.	*dathin-inja-*
lk-i	/waŋalkiɲca-/	ɳ-i	/ŋaɳiɲca-/	n-i	/ʈat̪iniɲca-/
	/waŋalk-in̪t̪a-/		/ŋaɳ-in̪t̪a-/		/ʈat̪in-in̪t̪a-/
	boomerang-fOBL		beach-fOBL		there-fOBL
	‘boomerang-CONT’		‘beach-CONT’		‘there-CONT’
j.	*kuwan-inja-*	k.	*kang-inja-*	l.	*yarbuth-inja-*
ɲ-i	/kuaniɲca-/	ŋ-i	/kaŋiɲca-/	t̪-i	/jaɻput̪iɲca-/
	/kuaɲ-in̪t̪a-/		/kaŋ-in̪t̪a-/		/jaɻput-in̪t̪a-/
	firestick-fOBL		speech-fOBL		animal-fOBL
	‘firestick-CONT’		‘speech-CONT’		‘there-CONT’
m.	*warngiij-inja-*	n.	*rik-inja-*		
c-i	/waɻɳiːciɲca-/	k-i	/ɻikiɲca-/		
	/waɻɳiːc-in̪t̪a-/		/ɻik-in̪t̪a-/		
	firestick-fOBL		crying-fOBL		
	‘firestick-CONT’		‘crying-CONT’		

A.4 Hiatus resolution

Table (A.24) repeats (4.43) from Ch.4, §4.4.1, setting out the five classes of modifications which apply to underlying /V+i/ sequences which form across the boundary of adjacent morphs, m_1+m_2. Table (A.25) repeats (4.44), which lists all m_2 morphs that undergo hiatus resolution across their boundary to the left, and the classes of hiatus resolution which apply to them. Table (A.25) column d. indicates which class of consonant cluster modifications (if any) each suffix triggers.

(A.24) The five classes of hiatus resolving modifications

Final in m_1*	Initial in m_2*							
	I		II		III	IV		V
	i/_V	i/_C	i	iː	i	i	iː	i
C	Ci	Ci	Ci	Ciː	Ci	Ci	Ciː	Ci
u	uj	u	ui	uiː		i	iː	iː
uː			uiː		iiː			
a	aj	a	ai	aiː	aː	a		ai
aː			aiː		aiː			
i	ij	i	iː	iː	iː	i	iː	iː
iː			iː		iː			

*Taking into account consonant deletions associated with the ‘deleting’ phonology (I,IV,V) and ‘regular’ phonology (II).

(A.25) Hiatus resolution class applying to m_1+m_2 boundary

Morph m_2				Modification class, given m_1 as:							
a.	b.	c.	d.	CV root			any other morph				
formal long locative	fLLOC	/kiː/	D					II			
formal locative	fLOC	/ki/	D	I			I	II			V
formal dual	fDU	/kiarŋ/	D	I			I				
formal from	fFRM	/in/	L/D		II					IV	
formal middle	fMID	/i/	—		II				III	IV	V
formal *iny*	fINY	/iɲ/	—							IV	
formal oblique	fOBL	/in̪t̪a/	L			III	I				
formal same	fSAME	/ic/	L			III	I				
			R							IV	
formal end	fEND	/iɲin/	R							IV	
formal continuous	fCONT	/iːc/	R							IV	

The forms in sets (A.27)–(A.32) provide specific examples corresponding to each filled cell in (A.24). The content of those sets is summarised in (A.26).

(A.26)

Table	A.27	A.28	A.29	A.30	A.31	A.32
Class	I	I	II	III	IV	V
Environment of m_2 vowel	/_C	/_V	all	/_C[a]	/_C[a]	/_C[a]

[a]only attested in the /_C environment

(A.27) Class I, where m_2 i/__C

a.	*junku-j-*	b.	*maku-ntha-*	c.	*-kuu-ntha-*
u-iC	/cunkuc-/	u-iC	/makun̪t̪a-/	u-iC	/-kuun̪t̪a-/
	/cunku-ic-/		/maku-in̪t̪a-/		/-kuu-in̪t̪a-/
	straight-fSAME-		woman-fOBL-		-fPROP-fOBL-
	‘correct’		‘woman-COMP’		‘-FUT-COMP’

d.	*maku--naa-*	e.	*maku--ring-*	f.	*warirra-j-*
u-kiC	/makunaa-/	u-kiC	/makuɻiŋ-/	a-iC	/waɻirac-/
	/maku-ki-naa-/		/maku-ki-ɻiŋ-/		/waɻira-ic-/
	woman-fLOC-fABL-		woman-fLOC-fALL-		nothing-fSAME-
	‘woman-ø-ABL’		‘woman-ø-DIR’		‘still nothing’

g.	*dangka-ntha-*	h.	*dangka--naa-*	i.	*dangka--ring-*
a-iC	/ʈaŋkan̪t̪a-/	u-kiC	/ʈaŋkanaa-/	a-kiC	/ʈaŋkaɻiŋ-/
	/ʈaŋka-in̪t̪a-/		/ʈaŋka-ki-naa-/		/ʈaŋka-ki-ɻiŋ-/
	man-fOBL-		man-fLOC-fABL-		man-fLOC-fALL-
	‘man-COMP’		‘man-ø-ABL’		‘man-ø-DIR’

j.	*ngawarri-j-*	k.	*jalji-nja-*	l.	*jalji--naa-*
i-iC	/ŋawaric-/	i-iC	/calciɲca-/	i-kiC	/calcinaa-/
	/ŋawari-ic-/		/calci-in̪t̪a-/		/calci-ki-naa-/
	thirsty-fSAME-		shade -fOBL-		shade-fLOC-fABL-
	‘still thirsty’		‘shade -COMP’		‘shade-ø-ABL’

m.	*jalji--ring-*
i-kiC	/calciɻiŋ-/
	/calci-ki-ɻiŋ-/
	shade-fLOC-fALL-
	‘shade-ø-DIR’

(A.28) Class I, where m_2 i/__V

a. u-kiV
maku-yarrng-
/makujarŋ-/
/maku-kiarŋ-/
woman-fDU-
'woman-DU'

b. u-ki-V
maku-y-a
/makuja/
/maku-ki-a/
woman-fLOC-T
'woman-INS-ø'

c. u-ki-V
yubu~yubu-y-ic-
/jupujupujic-/
/jupujupu-ki-ic-/
road-fLOC-fSAME
'along the road'

d. a-kiV
dangka-yarrng-
/ʈaŋkajarŋ-/
/ʈaŋka-kiarŋ-/
man-fDU-
'man-DU'

e. a-ki-V
dangka-y-a
/ʈaŋkaja/
/ʈaŋka-ki-a/
man-fLOC-T
'man-INS-ø'

f. a-ki-V
yurda-y-ic-
/juʈajic-/
/juʈa-ki-ic-/
inside-fLOC-fSAME
'along the inside'

g. a-kiC
ja-y-a
/caja/
/ca-ki-a/
foot-fLOC-T
'foot-INS-ø'

h. a-kiC
ja-yarrng-
/cajarŋ-/
/ca-kiarŋ-/
foot-fDU
'foot-DU'

i. i-kiV
kujiji-yarrng-
/kucicijarŋ-/
/kucici-kiarŋ-/
youth-fDU-
'youth-DU'

j. i-ki-V
kujiji-y-a-
/kucicija/
/kucici-ki-a/
youth-fLOC-T
'youth-INS-ø'

k. i-kiC
ki-y-a
/kija/
/ki-ki-a/
nearby-fLOC-T
'nearby-INS-ø'

(A.29) Class II

a. u-ki
Birrmu-yi-
/pirmui-/
/pirmu-ki-/
sternum-fLOC-
(Place name)

b. u-kiː
damuru-yii-wa-th-
/ʈamuɻuiːwa-t̪-/
/ʈamuɻu-kiː-wa-t̪-/
corm-‹fLLOC-fINCH›-TH
'corm-‹COLL›-ø'

c. uː-iC
bu-yii-j-
/puiː-c-/
/puː-i-c-/
pull-fMID-TH-
'pull-MID-ø'

d. u-ki
Bartha-yi-
/paɻʈai-/
/paɻʈa-ki-/
track-fLOC-
(Place name)

e. a-i
ra-yin-
/ɻain-/
/ɻa-in-/
south-fFRM-
'from the south'

f. a-kiː
thungkuwa-yii-wa-th-
/t̪uŋkuwaiːwa-t̪-/
/t̪uŋkuwa-kiː-wa-t̪-/
m.-‹fLLOC-fINCH›-TH
'mangroves-‹COLL›-ø'

g.	*ba-yii-j-*	h.	*ri-in-*	i.	*kulkiji-i-wa-th-*
aː-iC	/paiː-c-/	i-i	/ɻiːn-/	i-kiː	/kulkiciːwa-t̪-/
	/paː-i-c-/		/ɻi-in-/		/kulkici-kiː-wa-t̪-/
	bite-fMID-TH-		east-fFRM-		shark-‹fLLOC-fINCH›-TH
	‘bite-MID-ø’		‘from the east’		‘shark-‹COLL›-ø’

j.	*kii--j-*
uː-iC	/kiː-c-/
	/kiː-i-c-/
	shelter-fMID-TH-
	‘shelter-MID-ø’

(A.30) Class III

a.	*buri-yii-j-*	b.	*kuli-yii-j-*	c.	*jaa-nja-*
u-iC	/puɻiiː-c-/	uː-iC	/kuliiː-c-/	a-iC	/caːɲca/
	/puɻu-i-t̪-/		/kuluː-i-c-/		/ca-in̪t̪a-/
	gather-fMID-TH-		scratch-fMID-TH-		foot-fOBL-
	‘gather-MID-ø’		‘scratch-MID-ø’		‘foot-COMP’
d.	*raa--ring-*	e.	*danaa--j-*	f.	*marra-yii-j-*
a-kiC	/ɻaːɻiŋ/	a-iC	/ʈanaː-c-/	aː-iC	/maraiː-c-/
	/ɻa-ki-ɻiŋ-/		/ʈana-i-t̪-/		/maraː-i-c-/
	south-fLOC-fALL-		leave-fMID-TH-		show-fMID-TH-
	‘south-ø-DIR’		‘leave-MID-ø’		‘show-MID-ø’
g.	*ni-ic-*	h.	*thi-inja-*	i.	*ki-i-naa-*
i-iC	/ɳiːc-/	i-iC	/t̪iːɲca-/	i-kiC	/kiːnaa-/
	/ɳi-ic-/		/t̪i-in̪t̪a-/		/ki-ki-naa-/
	3sg-fSAME-		tea-fOBL-		nearby-fLOC-fABL-
	‘the same’		‘tea-COMP’		‘nearby-COMP’
j.	*kurrii--j-*	k.	*wanjii--j-*		
i-iC	/kuriː-c-/	iː-iC	/waciː-c-/		
	/kuri-i-c-/		/waɲciː-i-c-/		
	see-fMID-TH-		ascend-fMID-TH-		
	‘see-MID-ø’		‘ascend-MID-ø’		

(A.31) Class IV

a.	*-waal-i-j-*	b.	*bardang-iny-*	c.	*ngij-iny-*
u-i	/-waːli-c-/	u-i	/paʈaŋiɲ-/	u-i	/ŋiciɳ-/
	/-waːlu-i-t̪-/		/paʈaŋu-iɲ-/		/ŋicu-iɳ-/
	-‹fOEVIT-fMID›-TH-		big-fINY-		1sg-fINY-
	'-SEVIT-'		'big toe; thumb'		'1sg-POSS'

d.	*ba-l-ij-*	j.	*junk-iij-arri-*	k.	*ba-l-iij-*
uŋ-i	/palic-/	u-iː	/cunkiːcari-/	uŋ-iː	/paliːc-/
	/pat̪-ɹuŋ-ic-/		/cunku-iːc-wari-/		/pat̪-ɹuŋ-iːc-/
	west-fALL-fSAME-		west-fCONT-fPRIV		west-fALL-fCONT-
	'far to west'		'without reciprocating'		'far to west'

g.	*yurda-n-ji-*	h.	*mutha-ny-*	i.	*jirrkaa-n-*
a-i	/juʈaɲci-/	a-i	/mut̪aɲ-/	a-i	/cirkaan-/
	/juʈa-iɲ-ki-/		/mut̪a-iɲ-/		/cirkaa-in-/
	inside-fINY-fLOC-		much-fINY-		north-fFRM-
	'pregnant'		'excessive$_{\text{NL}}$'		'form the north'

e.	*dirrkuli-ny-*	f	*bath-in-ki-r-ij-*	l.	*Balarr-i-r-iij-*
i-i	/ʈirkuliɲ-/	iŋ-i	/pat̪inkiɻic-/	iŋ-iː	/palariɻiiːc-/
	/ʈirkuli-iɲ-/		/pat̪-in-ki-ɹiŋ-ic-/		/palar-ki-ɹiŋ-iːc-/
	husband-fINY-		west-fFRM-fLOC-fALL-fSAME-		white-fLOC-fALL-fCONT-
	'male'		'west across a boundary'		(Place name)

(A.32) Class V

a.	*-marii--j-*	b.	*Birrmi-i-*
u-iC	/-maɻiː-c-/	u-ki	/pirmiː-/
	/-maɻu-i-t̪-/		/pirmu-ki-/
	-‹fDAT-fMID›-TH-		sternum-fLOC-
	'-‹TRANS›-Ø-'		(Place name)

A.5 Vowel–laminal sequences

There are only three suffixes which exhibit a surface alternation between laminal dental and laminal palatal consonants (Ch.4, §4.6.1). These are thematic (TH) /t̪/, the formal remote (fREM) /t̪/ and the formal oblique (fOBL) /in̪t̪a/. Examples of TH were shown in Ch.3, §3.4.1 and §3.13.1; fREM and fOBL are exemplified in (A.33) and (A.34) below.

(A.33) Formal remote (fREM) /t̪/

a.	*riya-th-*	b.	*walma-th-*	b.	*warra-th-*
a-t̪	/ɻiat̪-/	a-t̪	/walmat̪-/	a-t̪	/warat̪-/
	/ɻia-t̪-/		/walma-t̪-/		/wara-t̪-/
	east.fLOC-fREM-		high$_{NL}$-fREM-		far-fREM-
d.	*rar-i-j-*	e.	*jirrkari-j-*	f.	*bath-i-j-*
i-t̪	/ɻaɻic-/	i-t̪	/cirkaɻic-/	i-t̪	/pat̪ic-/
	/ɻaɻ-ki-t̪-/		/cirkaɻi-t̪-/		/pat̪-ki-t̪-/
	south-fLOC-fREM-		north.fLOC-fREM-		west-fLOC-fREM-

(A.34) Formal oblique (fOBL) /in̪t̪a/

d.	*dan-inja-*	a.	*dangka-ntha-*	e.	*-naa-ntha-*	h.	*jaa-nja-*
C-in̪	/ʈaniɲca-/	a-in̪	/ʈaŋkan̪t̪a-/	a-in̪	/-naan̪t̪a-/	a-in̪	/caːɲca-/
	/ʈan-in̪t̪a-/		/ʈaŋka-in̪t̪a-/		/-naa-in̪t̪a-/		/ca-in̪t̪a-/
	here-fOBL-		man-fOBL-		-fABL-fOBL-		foot-fOBL-
b.	*maku-ntha-*	f.	*-kuu-ntha-*	c.	*maali-nja-*	g.	*thii-nja-*
u-in̪	/makun̪t̪a-/	u-in̪	/-kuun̪t̪a-/	i-in̪	/maaliɲca-/	i-in̪	/t̪iːɲca-/
	/maku-in̪t̪a-/		/-kuu-in̪t̪a-/		/maali-in̪t̪a-/		/t̪i-in̪t̪a-/
	woman-fOBL-		-fPROP-fOBL-		tortoise-fOBL-		tea-fOBL-

A.6 Three post-lexical processes

This section briefly notes three post-lexical, segmental processes which were not covered within the discussion of variable realisation of individual segments in Ch.2.

As mentioned at several points, the double vowel sequence /aa/ becomes the single, long vowel /aː/ post-lexically.

The lexical sequence /n̪t̪/ often reduces to /n̪/ before a following vowel+nasal sequence even in slow, clear speech.[2] An example is shown in (A.35) in which lexical *kamburijuuntha* /kampuɻicuun̪t̪a/ becomes post-lexical *kamburijuunha* /kampuɻicuun̪a/ before *ngiju* /ŋicu/.

(A.35)	*Niya*	*kamburi-j-uu-**nh**a*	*ngiju,*
	ɳi-a	kampuɻi-c-kuu-in̪t̪a-ø	ŋicu-a
	3sg-T	talk-TH-fPROP-fOBL-T	1sg.COMP-T
	3sg-Ø	talk-Ø-POT-COMP-Ø	1sg.COMP-Ø
	'I'll tell him,' [W1960]		

Some speakers realise /ɳT/ sequences as [ɻNT] (where NT is a homorganic nasal+plosive), and /ɳm/ as /ɻm/.[3] Dawn Naranatjil for example produced (A.36a), and Sally Gabori (A.36b). Both of these speakers pronounce the place name *Warnbuli* with medial /ɻmp/ while May Moodoonuthi consistently pronounced it with /ɳp/, as does Roonga Bentinck in one recording.

(A.36)		a.	*karn-marii-ja*	b.	*kar-mu-yii-ja*
	Post-lexical		/kaɳmaɻiːca/		/kaɻmuiːca/
	Lexical		/kaɳmaɻiːca/		/kaɳmuiːca/
			/kaɳ-maɻu-i-t̪a/		/kaɳ-wuː-i-ca/
			grass-‹fDAT-fMID›-TH.T		grass-put-fMID-TH.T
			'grass-‹TRANS›-ACT'		'grass-put-MID-ACT'

[2] Reduction of /ɲc/ to /ɲ/ in a similar environment is rare.

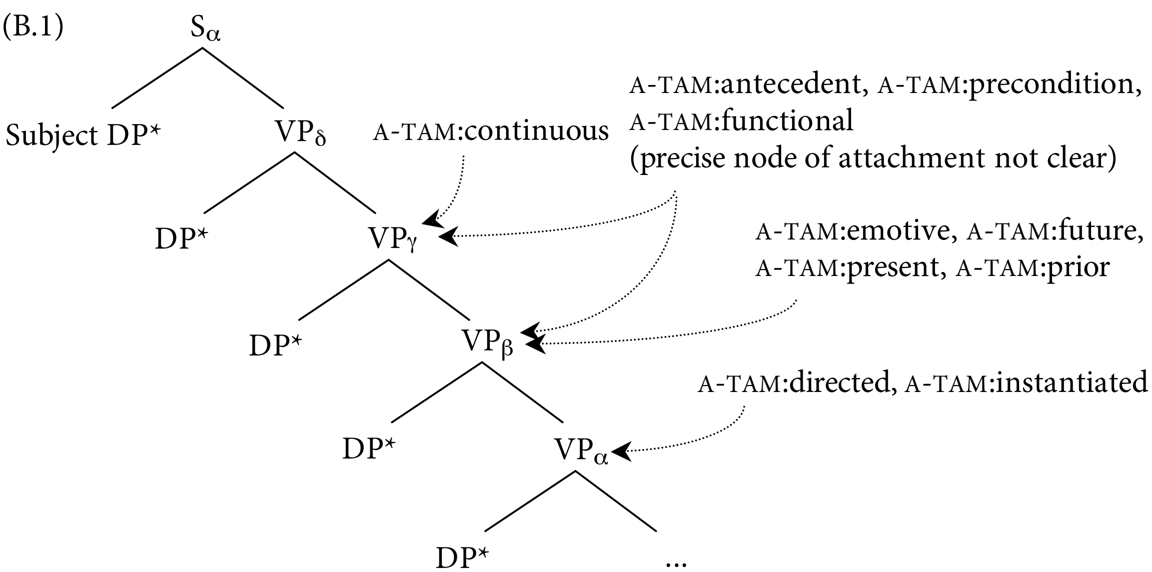
[3] I have too few other /ɳN/ tokens to comment on them.

I am not sure at this point whether these realisations containing /ɻ/ are in any kind of intra-speaker variation with the corresponding realisation containing /ɳ/, or whether the variation is only between speakers. It is also unclear whether there is any lexical specificity involved.

Appendix B Distribution of A-TAM

As argued in Ch.6, §6.5.4, A-TAM features attach to one of three VP nodes as shown in (B.1), which repeats the tree from (6.69). The position which a DP occupies within the non-surface syntactic tree then determines which A-TAM feature values it can potentially inherit, and hence, what values its constituent words can inflect for.

(B.1)



Appendix B provides examples sentences which illustrate, via the patterns of inflection which they instantiate, the VP mother nodes selected by various DP types. Because A-TAM features are inherited from a VP which is superordinate to the whole DP, the inflectional behaviour of an individual nominal word with respect to A-TAM is determined not by the word itself, but by the DP daughter of VP within which it appears (Ch.6, §6.5.4). What determines the position of the DP in the syntactic tree is usually its semantic–pragmatic role, but in some cases this is overridden by the head N of NP within DP. Consequently, the subsections below are organised sometimes according to DPs' roles, and sometimes according to the head N of their NP.

The appendix is organised as follows: §B.1 contains CASE:locative DPs which could be analysed as daughters of VP_α or as complements of V (cf Ch.6, §6.5.5); §B.2 presents other DP daughters of VP_α; §B.3 contains DPs for which evidence is ambiguous, and which could be daughters of VP_α or VP_β; §B.4 presents DP daughters of VP_β; §B.5 presents DP daughters of VP_γ; §B.6 presents DPs which are ambiguously either daughters of VP_γ or of VP_δ; and §B.7 containts DP daughters of VP_δ.

B.1 CASE:locative daughters of VP_α / complements of V

B.1.1 CASE:locative locations

CASE:locative is visible only in the absense of A-TAM features (Ch.6 ,§6.6.7), as in (B.2).

(B.2) Inflected with fLOC in a {TH-TAM:imperative, A-TAM:Ø} clause

Narrkiri-ja	*mala-a*	***ngarn-ki**- !*
bury-TH.T	beer-T	beach-fLOC-T
bury-IMP	beer-Ø	beach-LOC-Ø

'Bury the beer on the beach!' [E744]

(B.3) Inflected for A-TAM:instantiated, which attaches to VP$_{\alpha}$

Banthal~wanthalk-a	***yark-iy-a***	***nguku-y-a***	*thaldi-j.*
pan̪talk-pan̪talk-ka	jaɻk-ki-a	ŋuku-ki-a	t̪alti-ca
‹weed$_{NL}$-weed$_{NL}$›-T	under-fLOC-T	water-fLOC-T	grow-TH.T
water weed-Ø	under-INS-Ø	water-INS-Ø	grow-ACT

‘Water weed grows under the water.’ [E644]

(B.4) Inflected for A-TAM:directed, which attaches to VP$_{\alpha}$

Dan-da	***kurndaji-walath-i-ri***	*wirdi-j-i-r,*
here-T	sandhill-fPL-fLOC-fALL.T	stay-TH-fLOC-fALL.T
here-ø	sandhill-PL-Ø-DIR	stay-Ø- Ø-DIR

jungarrba	*bal-d.*
big-T	leaf-T
big-Ø	leaf-Ø

‘(*Kunybalka* creepers) grow here along the high sandhills, they have a big leaf.’ [R2005-jul08]

(B.5) Inflected for A-TAM:future, which attaches to VP$_{\beta}$ (−COMP)

Jambathu-	*wirdi--nang-ku-*	***dumu-uru-*.**
Mo.Fa-T	stay-TH-fNEG-fPROP-T	shore-fPROP-T
Mo.Fa-ø	stay-Ø-NEG-POT-Ø	stay-Ø-FUT-Ø

‘Your grandfather couldn’t stay on the shore.’ [R2007-may16]

(B.6) Inflected for A-TAM:present, which attaches to VP$_{\beta}$ (+COMP)

Dathina	*riy-a*	*warra-ja*	*nga-ku-l-d,*	*ri-wurrka-*
there.T	south-T	go-TH.T	1-2-pl-T	south-fLOC.fOBL-T
there	south-Ø	go-IMP	1-2-pl-Ø	south-INS.COMP-Ø

ni-wa-a	***ngarn-kurrka-***	*thula-th-urrk-*
3sg-fCOMP-T	beach-fLOC.fOBL-T	descend-TH-fLOC.fOBL-T
3sg-COMP-Ø	beach-INS.COMP-Ø	descend-Ø-PRES.COMP-Ø

‘Let’s go there in the south, as he comes down to the beach in the south.’ [W1960]

(B.7) Inflected for A-TAM:antecedent, which attaches to VP_{β} or possibly VP_{γ}

Bath-in-da	*thula-th-arrma-th,*
west-FROM-T	descend-TH-CAUS-TH.T
west-from-ø	descend-Ø-CAUS-IMP

thungkuwa--ngarrba-	*wirdi--n-ngarrb-.*
swamp-fCONS-T	stay-TH-‹fN-fCONS›-T
swamp-ANTE-Ø	stay-Ø-ANTE-Ø

‘Bring down from the west the ones who have been in the swamp!’ [R2005-jul15a]

(B.8) Inflected for A-TAM:continuous, which attaches to VP_{γ}

Nginya-nang-kuruw-a	***warngij-inja***-	***dulk-inja***-	*wirdind?*
‹fFRUST-fNEG-fPROP›-T	one-fOBL-T	place-fOBL-T	stay-TH-fN-T
‹why›-Ø	one-CONT-Ø	place-CONT-Ø	stay-Ø-PROG-Ø

‘Why is it staying in one place?’ [R2005-jul14a]

B.1.2 CASE:locative demoted non-human agent DPs

(B.9) Inflected for A-TAM:instantiated, which attaches to VP_{α}

Nga-da	*ba-yii-ja*	***wanku-y-.***
1sg-T	bite-fMID-TH.T	shark-fLOC-T
1sg-Ø	bite-MID-ACT	shark-INS-Ø

‘I was bitten by a shark.’ [E351.ex.9-138]

(B.10) Inflected for A-TAM:prior, which attaches to VP_{β} (−COMP)

Mala--na	*kurrkaa--jarr-,*	*yakuri-i-wa-th-arra-nth-.*
sea-fLOC-fABL-T	take-fMID-TH-fCONS-T	fish-‹fLLOC-fINCH›-TH-fCONS-fOBL-T
sea-Ø-PRIOR-Ø	take-MID-Ø-PST-Ø	fish-‹COLL›-Ø-PST-COMP-Ø

‘She was taken by the sea, when she went for fish.’ [R2005-jun29]

(B.11) Inflected for A-TAM:emotive, which attaches to VP_β (+COMP)

Bakii-ja	*yiiwi-ja*	*ngaruwarra-y-a*	*kaburrba-y,*
all do-TH.T	sleep-TH.T	between-fLOC-T	fire-fLOC-T
all do-ACT	sleep-ACT	between-INS-T	fire-INS-T

kalarrang-inja-	*ba-yii--nyarra-nth-.*
mosqito-fOBL-T	bite-fMID-TH-fAPPR-fOBL-T
mosqito-EMO.COMP-Ø	bite-MID-Ø-APPR-COMP-Ø

'Everyone slept bewteen fires, so they wouldn't be bitten by mosquitoes' [E696]

(B.12) Inflected for A-TAM:antecedent, which attaches to VPβ or VP_γ (+COMP)

Dathin-kiy-a ...	*nga-ku-l-da*	*kurirr-walath-ij-iy-a*
there-fLOC-T	1-2-pl-T	dead-‹fPL-fSAME›-fLOC-T
there-EMP-Ø	1-2-pl-Ø	dead-‹EVERY›-EMP-Ø

dalururdaluru-ngarrba-y-a	*balaa---n-ngarrba-y-a*
gun-fCONS-fLOC-T	kill-fMID-TH-‹fN-fCONS›-fLOC-T
gun-ANTE-EMP-Ø	kill-MID-Ø-ANTE-EMP-Ø

'We and all the people killed by the gun were there.' [E1984-03-01]

B.1.3 CASE:locative second object DPs

(B.13) Inflected for CASE:locative in the context of A-TAM:Ø

Dathina	*makurarra*	*buka-banji--n-d,*	*wuu-ja*	***jardarrka-y-!***
that.T	wallaby-T	‹rotten-stink-TH-fN›-T	give-TH.T	crow-fLOC-T
that	wallaby-Ø	rancid-Ø	give-IMP	crow-LOC-Ø

'That wallaby (meat) stinks, give it to the crows!' [E659]

(B.14) Possibly inflected for CASE:locative, or for A-TAM:instantiated, which attaches to VP_α

Wadu-y-a	*wuu-ja*	*wuran-ki-.*
smoke-fLOC-T	put-TH.T	food-fLOC-T
smoke-(LOC|INS)-T	put-ACT	food-INS-Ø

'We put the food in the smoke.' [E107.ex.3-25]

(B.15) Inflected for A-TAM:prior which attaches to VP$_{\beta}$ (+COMP)

Wirriku--naa-ntha-	*wuu-j-arra-ntha-,*	*rarrwa-th-arra-nth-.*
oven-fLOC-fABL-fOBL-T	put-TH-fCONS-fOBL-T	roast-TH-fCONS-fOBL-T
oven-Ø-PRIOR-COMP-Ø	put-Ø-PAST-COMP-Ø	roast-Ø-PAST-COMP-Ø

'(*Warabu* creeper) is put in a ground oven or roasted' [E84-05-07]

(B.16) Inflected for A-TAM:future, which attaches to VP$_{\beta}$ (–COMP)

Nga-da	*dathin-ku*	*wuu-j-u-*	*ngurrumanji-wu-*	***kaburrba-wu-.***
1sg-T	that-fPROP-T	put-TH-fPROP-T	billy can-fPROP-T	fire-fPROP-T
1sg-Ø	that-FUT-Ø	put-Ø-POT-Ø	billy can -FUT-Ø	fire-FUT-Ø

'I'll put that thing, the billy can, on the fire.' [W1960]

(B.17) Inflected for CASE:locative in the context of A-TAM:Ø

Marraa-ja	*dangka-a*	***kurumbu-y-*** *!*
show-TH.T	man-T	spear-fLOC-T
show-IMP	man-Ø	spear-LOC-Ø

'Show the man the spear!' [E338.ex.9-101]

(B.18) Possibly inflected for CASE:locative, or for A-TAM:instantiated, which attaches to VP$_{\alpha}$

Dangka-wala-da	*marraa-ja*	*wuu-ja*	*ngij-in-ji-*
person-PL-T	show-TH.T	give-TH.T	1sg-fPOSS-fLOC-T
person-PL-Ø	show-IMP	give-IMP	1sg-Ø-INS-T

mutha-y-a	***dulk-i-*** *.*
many-fLOC-T	place-fLOC-T
many-(LOC|INS)-Ø	place-(LOC|INS)-Ø

'People have shown me many places.' [E728]

(B.19) Inflected for A-TAM:future, which attaches to VP$_{\beta}$ (–COMP)

Nga-da	***wangalk-u-***	*marraa-j-u-*	*ngum-ban-maru-th-u- .*
1sg-T	boomerang-fPROP-T	show-TH-fPROP-T	2sg-fPOSS-fDAT-TH-fPROP-T
1sg -Ø	boomerang-FUT-Ø	show-Ø-POT-Ø	2sg-Ø-DAT-Ø-POT-Ø

'I will show you the boomerang.' [W1960]

B.2 Daughters of VP$_{\alpha}$

B.2.1 CASE:utilitive and CASE:instrumental DPs

(B.20) Inflected for A-TAM:instantiated, which attaches to VP$_{\alpha}$

Nga-da	*kinaa-j*	*bi-lu-wan-ji-,*	***yakuri-marra-y,***
1sg-T	tell-TH.T	3-pl-fPOSS-fLOC-T	fish-fUTIL-fLOC-T
1sg-Ø	light-ACT	3-pl-Ø-INS-Ø	fish-UTIL-INS-Ø

ngawun-ji,	*karna-j.*
coals-fLOC-T	light-TH.T
coals-INS-Ø	light-ACT

'I'll tell them to burn down some coals for the fish.' [W1960]

(B.21) Inflected for A-TAM:instantiated, which attaches to VP$_{\alpha}$

Thaldi-ja	*kurri-ja*	***dumu-nguni-y-a***	***walmathi-nguni*--.**
stand-TH.T	look-TH.T	dune-fINST-fLOC-T	top-fINST-fLOC-T
stand-ACT	look-ACT	dune-INST-INS-Ø	top-INST-INS-Ø

'(They) stood and looked from on top of the sandhill.' [E153.ex.4-71]

(B.22) Inflected for A-TAM:future which attaches to VPβ (+COMP)

Wirril-uu-ntha-	*buru-th-uu-ntha-*	***kuna-walany-marra-wuu-nth*-,**
leaf-fPROP-fOBL-T	gather-TH-fPROP-fLOC-T	child$_{NL}$-fPL-fUTIL-fPROP-fOBL-T
leaf-FUT-COMP-Ø	gather-Ø-POT-EMP-Ø	child-PL-UTIL-FUT-COMP-Ø

karba~karba-ru-th-uu-nth- .
‹dry$_{NL}$-dry$_{NL}$›-fFACT-TH-fPROP-fOBL-T
dry-FACT-Ø-POT-COMP-Ø
'I'll gather some *wirrilda* leaves for the baby, to dry it.'[R2005-aug02a]

(B.23) Inflected for A-TAM:future which attaches to VPβ (+COMP)

Kambuda-	*kala-th-uru-y-a*	***narra-nguni-wuru-y-a**,*
nut-T	cut-TH-fPROP-fLOC-T	knife-fINST-fPROP-fLOC-T
nut-Ø	cut-Ø-POT-EMP-Ø	knife-INST-FUT-EMP-T

kurda-wu-j-uru-y-
coolamon-fDON-TH-fPROP-fLOC-T
coolamon-DON-Ø-POT-EMP-Ø
'We'll cut the pandanus nut with a knife and put it in the coolamon.'
[R2005-jul08]

(B.24) Inflected for A-TAM:future which attaches to VPβ (–COMP)

Kira-th-u-	***yurda-nguni-wu-***	***walbu-nguni-wu-** .*
gather-TH-fPROP-T	inside-fINST-fPROP-T	raft-fINST-fPROP-T
gather-TH-POT-T	inside-INST-FUT-T	raft-INST-FUT-T

'You can gather up (the dead fish) in a raft.' [R2005-jun29]

(B.25) Inflected for A-TAM:prior, which attaches to VPβ (–COMP)

Nying-ka	*ngi-nurruw-a*	*dali-j-arr-,*	***kuwan-marra--na-** ?*
2sg-T	wood-fASSOC-T	come-TH-fCONS-T	fire stick-fUTIL-fLOC-fABL-T
2sg-Ø	wood-ASSOC-Ø	come-Ø-PST-Ø	fire stick-UTIL-Ø-PRIOR-Ø

'Have you brought wood for firesticks?' [E160.ex.4-98; W1960]

(B.26) Inflected for A-TAM:continuous, which attaches to VP_{γ}

Niy-a	*kala-n-da*	*thungal-inja-*	***bijarrba-marra-ntha***
3sg-T	cut-fN-T	tree-fOBL-T	dugong-fUTIL-fOBL-T
3sg-Ø	where-PROG-Ø	tree-CONT-Ø	dugong-UTIL-CONT-Ø

narra-nguni-nj-
axe-fINST-fOBL-T
axe-INST-CONT-Ø
'He is cutting the tree with a shell axe, to use for (spearing) dugong.'
[E112.ex.3-40]

B.2.2 Case:genitive circumessive DPs

(B.27) Inflected for A-TAM:instantiated, which attaches to VP_{α}

Nguku-karran-jiy-a	*nguku-rnurru-*	*diya-ja*	*wirdi-j* .
water-fGEN-fLOC-T	water-fASSOC-T	eat-TH.T	stay-TH.T
water-GEN-INS-Ø	water-ASSOC-Ø	eat-ACT	stay-ACT

'They ate around the water, at the water.' [E1984-03-01]

B.2.3 Case:proprietive instruments DPs #1

Case:proprietive instruments can appear as daughters of VP_{α} (shown here) or of VP_{γ} (shown in §B.5.3).

(B.28) Inflected for A-TAM:directed, which attaches to VP_{α}

Bi-rr-a	*ra-nthu-th-i-r,*	***wumburung-kuru--r*** ,
3-du-T	spear-fRCP-TH-fLOC-fALL.T	spear-fPROP-fLOC-fALL.T
3-du-Ø	spear-RCP-TH-Ø-DIR	spear-PROP-Ø-DIR

dathin-kuru-wa	*maku-uru.*
that-fPROP-T	that-fPROP-T
that-PROP-Ø	that-PROP-Ø

'They are fighting one another with spears over that woman.' [W1960]

(B.29) Inflected for A-TAM:present, which attaches to VP_{β} (+COMP)

Bula-th-urrka-	***milka-wuru-urrk-*** .
remove-TH-fLOC.fOBL-T	milk-fPROP-fLOC.fOBL-T
remove-Ø-IMMED.COMP-Ø	milk-PROP-PRES.COMP-Ø

'(Babies' limbs) are wiped clean with milk.' [R2005-jul08]

(B.30) Inflected for A-TAM:prior, which attaches to VPβ (–COMP)

Niy-a	*dathina*	*dangka-a*	*ngij-in-ji-na-*	***wumburung-kuru--na-***
3sg-T	that.T	man-T	1sg-fPOSS-fLOC-fABL-T	spear-fPROP-fLOC-fABL-T
3sg-Ø	that	man-Ø	1sg-Ø-Ø-PRIOR-Ø	spear-PROP-Ø-PRIOR-Ø

raa-j-arr-
spear-TH-fCONS-T
spear-Ø-PST-Ø
'That man speared me with a spear.' [W1960]

(B.31) Inflected for A-TAM:future, which attaches to VPβ (–COMP)

Nga-da	*bala-th-u-*	*ki-rr-wan-ju-*	***ngij-in-juru-uru-wa***
1sg-T	hit-TH-fCONS-T	2-du-fPOSS-fPROP-T	1sg-fPOSS-fPROP-fPROP-T
1sg -Ø	hit-Ø-PST-Ø	2-du-Ø-FUT-Ø	1sg-Ø-PROP-FUT-Ø

karwa-wuru-uru- .
club-fPROP-fPROP-T
club-PROP-FUT-Ø
'I will hit you two with my club.' [W1960]

(B.32) Inflected for A-TAM:cont, which attaches to VP_{γ}

Nga-da	*kala--n-da*	*thungal-inja-*	***narra-wuru-nth-*** .
1sg-T	cut-TH-fN-T	tree-fOBL-T	knife-fPROP-fOBL-T
1sg-Ø	cut-Ø-PROG-Ø	tree-CONT-Ø	knife-PROP-CONT-Ø

'I am cutting down the tree with a shell knife.' [E418.ex.10-32]

B.2.4 CASE:Ø demonstrative locations

Location DPs with a demonstrative N head of NP take CASE:Ø. This can be seen by their faliure to inflect with fLOC in the absense of A-TAM features, as in (B.33).

(B.33) Not inflected with fLOC in a {TH-TAM:imperative, A-TAM:Ø} clause

Dali--na	*nying-ka*	***dathina***	*wirdi-j !*
come-TH-fNEG.T	2sg-T	there.T	stay-TH.T
come-Ø-NEG.IMP	2sg-Ø	there	stay-IMP

'Don't come, stay there!' [W1960]

(B.34) Inflected for A-TAM:instantiated, which attaches to VP_{α}

Dangka-a	*daraa--ja*	***dathin-ki-.***
person-T	circumcise-fMID-TH.T	there-fLOC-T
person-Ø	circumcise-MID-ACT	there-INS-Ø

'Men were circumcised there' [R2005-jul21]

(B.35) Inflected for A-TAM:directed, which attaches to VP_{α}

Niy-a	***dathin-ki-ri***	*thaari-j-i-r.*
3sg-T	there-fLOC-fALL.T	bring back-TH-fLOC-fALL.T
3sg-Ø	there-Ø-DIR	bring back-Ø-Ø-DIR

'He brought (the water) back there.' [R2007-jun01]

(B.36) Inflected for A-TAM:present which attaches to VP_{β} (+COMP)

Barji-j-urrka-	***dan-kurrka-***	*bardangu-nth-*
fall-TH-fLOC.fOBL-T	here-fLOC.fOBL-T	large-fOBL-T
fall-Ø-IMMED.COMP-Ø	here-PRES.COMP-Ø	large-COMP-Ø

'It's raining heavily here.' [R2005-aug02a]

(B.37) Inflected for A-TAM:emotive, which attaches to VP_{β} (–COMP)

Niy-a	***dan-inja-***	*yiiwi--da-*	*nga-ku-lu-wan-inja-*	*natha-nth-.*
3sg-T	here-fOBL-T	sleep-TH-fDES-T	1-2-pl-fPOSS-fOBL-T	camp-fOBL-T
3sg-Ø	here-EMO-Ø	sleep-Ø-DES-Ø	1-2-pl-POSS-EMO-Ø	camp-EMO-Ø

'He should sleep here in our camp' [W1960]

(B.38) Inflected for A-TAM:prior which attaches to VP_{β} (–COMP)

Ngaaka-	*dangka-a*	***dan-ki-na-***	*ngambura-th-arr- ?*
what-T	person-T	here-fLOC-fABL- T	dig well-TH-fCONS-T
what-Ø	person-Ø	here-Ø-PRIOR- Ø	dig well-Ø-PAST-Ø

'Who dug a well here?' [W1960]

B.2.5 *Kada-* 'again' #1

Kada 'again' can also appear as daughter of VP_δ, cf §B.7.3.

(B.39) Inflected for A-TAM:instantiated, which attaches to VP_α

Jirrkara-	***kada-y-a***	*thaa-th.*
north-T	again-fLOC-T	return-TH.T
north-Ø	again-INS-Ø	return -ACT

'Then I went north again.' [E300.ex.8-7]

(B.40) Inflected for A-TAM:directed, which attaches to VP_α

Dathina	*dangka-a*	*barji-j-arr-,*	***kada--ri***
that.T	man-T	fall-TH-fCONS-T	again-fLOC-fALL.T
that	man-Ø	fall-Ø-PST-Ø	again-Ø-DIR

rabi-j-i-ri	*barji-j-i-r.*
rise-TH-fLOC-fALL.T	fall-TH-fLOC-fALL.T
rise-Ø-Ø-DIR	fall-Ø-Ø-DIR

'That man fell down, got up again and fell down again.' [W1960]

(B.41) Inflected for A-TAM:future which attaches to VP_β , and for +COMP

Badi-j-uu-ntha-	*ngiju-wa-*	*ngij-uu-ntha-*
carry-TH-fPROP-fOBL-T	1sg-fCOMP-T	wood-fPROP-fOBL-T
carry-Ø-POT-COMP-Ø	1sg-COMP-Ø	wood-Ø-FUT-COMP-Ø

kada-wuu-nth-.
again- fPROP-fOBL-T
again- Ø-FUT-COMP-Ø

'I'll carry wood again.' [R2005-aug02a]

(B.42) Inflected for A-TAM:future which attaches to VP_β (–COMP)

nyingka	*ri-in-da*	***kada-wu-***	*thaa-th-u-.*
2sg-T	east-fFRM-T	again-fPROP-T	return-TH-fPROP-T
2sg-Ø	east-ABL-Ø	again-FUT-Ø	return-Ø-POT-Ø

'You will come back from the east again.' [E300.ex.8-8]

(B.43) Inflected for A-TAM:continuous (2nd clause), which attaches to VP_{γ}

Kada	*julda~julda-wa-th-,*	***kada-ntha-***	*balkaji-wa--n-d.*
again.T	‹tough-tough›-fINCH-TH.T	again-fOBL-T	thin-fINCH-TH-fN-T
again	‹tough›-INCH-ACT	again-CONT-Ø	thin-INCH-Ø-PROG-Ø

'She's getting bony again, getting thin again.' [R2005-jul04b]

B.2.6 *Darr-* 'occasion; time', jina- darr- ~ jinardarr- 'when'

(B.44) Inflected for A-TAM:instantiated, which attaches to VP_{α}

Ngum-ban-janii--ja	*ngaka-tha*	***mutha-y-a***	***darr-i-***
2sg-fPOSS-‹fHALL-fMID›-TH.T	wait-TH.T	much-fFLOC-T	time-fFLOC-T
2sg-Ø-‹PURP›-ACT	wait-ACT	much-INS-Ø	time-INS-Ø

'I've been waiting for you a long time' [W1960]

(B.45) Inflected for A-TAM:future which attaches to VP_{β} (−COMP)

Nga-da	*bala-th-u-*	***mutha-wu-***	***darr-u-***
1sg-T	hit-TH-fPROP-T	much-fPROP-T	time-fPROP-T
1sg-Ø	hit-Ø-POT-Ø	much-FUT-Ø	time-FUT-Ø

'I will hit (it) many times.' [W1960]

(B.46) Inflected for A-TAM:prior which attaches to VP_{β} (−COMP)

Jina--na	***darr-i-na***	*nying-ka*	*jirrkaa-n-ki-na?*
what-fLOC-fABL-T	time-fLOC-fABL-T	2sg-T	north-fFRM-fLOC-fABL-T
what-Ø-PRIOR-Ø	time-Ø-PRIOR-Ø	2sg-Ø	north-ABL-Ø-PRIOR-Ø

'When did you come from the north?' [W1960]

(B.47) Inflected for A-TAM:emotive which attaches to VP_{β} (−COMP)

Niya	***jinardarr-inja-***	*dali--d-,*	*nga-ku-lu-wan-jani--d-?*
3sg-T	when-fOBL-T	come-TH-fDES-T	1-2-pl-fPOSS-fHALL-TH-fDES-T
3sg-Ø	when-EMO-Ø	come-Ø-DES-Ø	1-2-pl-Ø-HALL-Ø-fDES-Ø

'When will he come back here to get us?' [E370.ex.9-224]

B.2.7 *Yanij-* 'first'

(B.48) Inflected for A-TAM:directed, which attaches to VP_{α}

Ra-wa-n-mari-i-j-i-ri	***yanij-i-ri,***
south-fINCH-TH-‹fN-fDAT-fMID›-TH-fLOC-fALL.T	first-fLOC-fALL.T
south-INCH-Ø-‹let self do›-Ø-Ø-DIR	first-Ø-DIR

ra-wa--da	*thaa-d-*
south-fINCH-TH-fDES-T	return-TH-fDES-T
south-fINCH-Ø-DES-Ø	return-Ø-DES-Ø

'It's going back south first, it should return back south.' [R2005-jul21]

(B.49) Inflected for A-TAM:emotive which attaches to VP_{β} (–COMP)

Yanij-inja-	*wirdi-j-inj-*	*rarrwa-th-uru-y-*	*wuran-kuru-y-*
first-fOBL-T	stay-TH-fOBL-T	roast-TH-fPROP-fLOC-T	food-fPROP-fLOC-T
first-EMO-Ø	stay-Ø-HORT-Ø	roast-Ø-POT-EMP-Ø	food-FUT-EMP-Ø

'We should stay first, and cook some food.' [W1960]

(B.50) Inflected for A-TAM:present which attaches to VP_{β} (+COMP)

Nga-la-wa-	***yanij-urrka-***	*kamburi-j-urrka-*
1-pl-fCOMP-T	first-fLOC.fOBL-T	talk-TH-fLOC.fOBL-T
1-pl-COMP-Ø	first-PRES.COMP-Ø	talk-Ø-IMMED.COMP-Ø

'We're talking first' [R2005-jul21]

B.2.8 *Barruntha-* 'yesterday; in a while' #1

Barruntha- 'yesterday; in a while' acts either as a daughter of VP_{α} (as shown here) or of VP_{β} (as shown in §B.4.10).

(B.51) Possibly inflected for CASE:locative, or for A-TAM:instantiated, which attaches to VP_{α}

Nga-da	***barruntha-y-a***	*kurri-ja*	*makalmakal-i-*
1sg-T	yesterday-fLOC-T	see-TH.T	old woman$_{NL}$-fLOC-T
1sg-Ø	yesterday-(LOC|INS)-Ø	see-ACT	old woman$_{NL}$-INS-Ø

'I saw the old woman yesterday.' [W1960]

(B.52) Inflected for A-TAM:directed, which attaches to VP_{α}

Dathina	*kiyarrng-ka*	*dangka-a*	*bi-rr-i-da*	*dangka-a*
that.T	two-T	person-T	3-du-fSAME-T	person-T
that.Ø	two-T	person-Ø	3-du-SAME-Ø	person-Ø

barruntha--ri	*nga-ku-lu-wan-ji-r-*	*kamburi-j-i-r?*
yesterday-fLOC-fALL.T	1-2-pl-fPOSS-fLOC-fALL.T	speak-TH-fLOC-fALL.T
yesterday-Ø-DIR	1-2-pl-Ø-Ø-DIR	speak-Ø-Ø-DIR

'Are they the same two men who came to talk to us yesterday?' [E390.ex.9-308]

(B.53) Inflected for A-TAM:contemporaneous, which attaches to VP_{β} (+COMP)

Dan-da	*budu~budu-*	*dathin-ki-na-*	*dangka--na,*
this-T	‹boat$_{NL}$-boat$_{NL}$›-T	that-fLOC-fABL-T	man-fLOC-fABL-T
this-Ø	‹boat›-Ø	that-Ø-ABL-T	man-Ø-ABL-T

ni-wa-a	***barruntha-wurrk-***	*dali-jurrk-.*
3sg-fCOMP-T	yesterday-fLOC.fOBL-T	come-TH-fLOC.fOBL-T
3sg-COMP-Ø	yesterday-PRES.COMP-Ø	come-Ø-IMMED.COMP-Ø

'This is the boat of the man, who came here yesterday.' [E502.ex12-35]

(B.54) Inflected for A-TAM:future, which attaches to VP_{β} (–COMP)

Barruntha-wu-	*nga-da*	*thaa-th-u- .*
a while-fPROP-T	1sg-T	return-TH-fPROP-T
a while-FUT-Ø	1sg -Ø	return-Ø-POT-Ø

'I'll come back in a little while.' [E649]

B.3 Daughters, ambiguously of VP_α or VP_β

B.3.1 *balmbi-* 'tomorrow', *wulji-* 'last night'

Both *balmbi* /palmpi/ 'tomorrow/ the next day' and *wulji* /wulci/ 'last night' end in /i/, in which case the roots plus fLOC are identical to the roots themselves. As such, it is not possible to tell, in examples such as (B.55), whether they inflect for CASE:locative or A-TAM:instantiated.

(B.55) Possibly inflected for CASE:locative, or for A-TAM:instantiated, which attaches to VP_α

Mirniwarrkiy-a	*dangka-a*	***balmbiy-a***	*diya-ja*	*bijarrba-y-.*
successful-T	man-T	next.day(-fLOC)-T	eat-TH.T	dugong-fLOC-T
successful-ø	man-Ø	next.day(-LOC|INS)-Ø	eat-ACT	dugong-INS-Ø

The man who killed it could eat the dugong the next day. [E642]

(B.56) Inflected for A-TAM:emotive, which attaches to VPβ (–COMP)

Nga-da	***balmbi-nja-***	*kurri--da-*	*kunya-ntha-*	*wangalk-inj-.*
1sg-T	tomorrow-fOBL-T	look-TH-fDES-T	small-fOBL-T	boomerang-fOBL-T
1sg-Ø	tomorrow-EMO-Ø	look-Ø-DES-Ø	small-EMO-Ø	boomerang-EMO-Ø

'I should look at that small boomerang tomorrow.' [W1960]

(B.57) Inflected for A-TAM:prior, which attaches to VPβ (–COMP)

Nying-ka	*jijina--na-*	*warra-j-arra*	***wulji--na***
2sg-T	which.way-fLOC-fABL-T	go-TH-fCONS-T	last night-fLOC-fABL-T
2sg-Ø	which.way-Ø-PRIOR-Ø	go-Ø-PST-Ø	small- Ø-PRIOR-Ø

'Which way did you head last night?' [E368.ex.9-213]

(B.58) Inflected for A-TAM:future, which attaches to VPβ (+COMP)

Balmbi-wuu-ntha-	*warra-j-uu-ntha-*	*jurrkurung-kuu-nth-.*
tomorrow-fPROP-fOBL-T	go-TH-fPROP-fOBL-T	north.ALL-fPROP-fOBL-T
tomorrow-FUT-COMP-Ø	go-Ø-POT-COMP-Ø	north.ALL-FUT-COMP-Ø

'I'll go north tomorrow.' [R2005-jul21]

(7.59) Inflected for A-TAM:present, which attaches to VPβ (+COMP)

Mala-ntha	*niy-a*	*yumari-j-urrka-*	*ki-wurrka-*
sea-fOBL-T	3sg-T	sink-TH-fLOC.fOBL-T	close -fLOC.fOBL-T
sea-COMP-ø	3sg-Ø	sink-ø-IMMED.COMP-Ø	close-INS.COMP-Ø

laan-,	***wulji-wurrk-.***
fishing line-T	last night-fLOC.fOBL-T
fishing line-ø	last night-INS.COMP-Ø

'It washed away in the sea near the fishing line, last night.' [R2006-aug10]

B.4 Daughters of VPβ

B.4.1 CASE:Ø locations

CASE:Ø DPs which refer to locations are formally neutralised with CASE:locative DPs when they are inflected for A-TAM (cf Ch.6, §6.6.7). This section shows CASE:Ø location DPs which are daughters of VPβ, and which therefore do not inflect for A-TAM values which attach to VP_{α}. In these examples, it can be seen that the DP does not inflect for CASE:locative.

(B.60) Not inflected for CASE:locative in an A-TAM:Ø clause

Ki-l-da	*warra--na*	*jirrkurii--na*	***wambal-da***	*wanjii--n!*
ki-l-ta	wara-c-na	cirkuɽiː-c- naŋ	wampal-ta	waɲciː-c-na
2-pl-T	go-TH-fNEG.T	3-pl-T	bush-T	ascend-TH-fNEG.T
2-pl-Ø	go-Ø-NEG.IMP	3-pl-Ø	bush-Ø	ascend-Ø-NEG.IMP

'Don't you all go up north into the bush!' [W1960]

(B.61) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Warra-a	***natha-a***	*wirdi-j,*	*bundalwaan-d.*
wara-a	naṯa-a	wiʈi-ca	puntalwaːɲ-ta
far-T	camp-T	stay-TH.T	menstruating-T
far-ø	camp-ø	stay-ACT	menstruating-Ø

'She camps far off, she's menstruating.' [E661]
(lit. 'She is in a distant camp, she's menstruating.')

B.4.2 CASE:allative DPs

(B.62) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Nga-da	*warra-ja*	***ngarn-ki-r***.
1sg-T	go-TH.T	beach-fLOC-fALL.T
1sg-Ø	go-ACT	beach-Ø-ALL

'I am going/have gone to the beach.' [E107.ex.3-25]

(B.63) Inflected for A-TAM:prior, which attaches to VPβ (–COMP)

Nga-da	*warra-j-arra-*	***ngarn-ki-ring-ki-na-*** .
1sg-T	go-TH-fCONS-T	beach-fLOC-fALL-fLOC-fABL-T
1sg-Ø	go-Ø-PAST-Ø	beach-Ø-ALL-Ø-PRIOR-T

'I went to the beach.' [E108.ex.3-27]

B.4.3 Bare stem compass locationals

(B.64) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Nga-da	*wirdi-ja*	***ba-d*** .
1sg-T	stay-TH.T	west-T
1sg-Ø	stay-ACT	west-Ø

'I am in the west.' [E207.ex.5-30a]

(B.65) Not inflected for A-TAM:directed, which attaches to VP_{α}

Kang-ki-ri	*marri-j-i-ri*	***jirrkar***- .
voice-fLOC-fALL.T	listen-TH-fLOC-fALL.T	north-T
voice-Ø-DIR	listen-Ø-Ø-DIR	north-Ø

'I am hearing a voice in the north' [E207.ex.5-30a]

(B.66) Inflected for A-TAM:future, which attaches to VPβ (+COMP)

Bath-uu-ntha-	*dii-j-uu-ntha*	*waldarra-nth-*,
west-fPROP-fOBL-T	set-TH-fPROP-fOBL-T	moon-fOBL-T
west-FUT-COMP-T	set-Ø-POT-COMP-T	moon-COMP-T

nga-da	*ri-in-da*	*thaa-th-u-*	*ngum-ban-janii--j-u-*
1sg-T	east-FROM-T	return-TH-fPROP-T	2sg-fPOSS-‹fHALL-fMID›-TH-fPROP-T
1sg-Ø	east-FROM-Ø	return-Ø-POT-Ø	2sg-ø-‹PURP›-Ø-POT-Ø

‘When the moon sets in the west, I’ll return to you from the east.’ [W1960]

(B.67) Inflected for A-TAM:future, which attaches to VPβ (–COMP)

Yuuth-u-	***jirrkara-wu***-	*kurri-j-u-*	*nga-ku-l-d.*
first-fPROP-T	north-fPROP-T	look-TH-fPROP-T	1-2-pl-T
first-FUT-T	north-FUT-T	look-Ø-POT-Ø	1-2-pl-Ø

‘We’ll look in the north first’ [E299.ex.8-5]

B.4.4 Allative stem compass locationals

(B.68) Not inflected for A-TAM:instantiated, which attaches to VP$_{\alpha}$

Ra-rung-ka	*bi-l-da*	*budii-j-iy-a*	*kuujuu-j-i-ring-ki-.*
south-fALL-T	3-pl-T	run away-TH-fLOC-T	swim-TH-fLOC-fALL-fLOC-T
south-ALL-Ø	3-pl-Ø	run away-Ø-IMMED-Ø	swim-Ø-Ø-DIR-INS-T

‘They’re running away to the south to swim.’ [R2005-jul08]

(B.69) Not inflected for A-TAM:directed, which attaches to VP$_{\alpha}$

Ba-lung-ka	*bantharra-*	*rajurri-j-i-ri*
west-fALL-T	some-T	walk around-TH-fLOC-fALL.T
south-ALL-Ø	some-Ø	walk around-Ø-Ø-DIR

budii-j-i-r.
run away-TH-fLOC-fALL.T
run away-Ø-Ø-DIR

‘Others are running around in the west.’ [R2005-aug02a]

(B.70) Inflected for A-TAM:present, which attaches to VPβ (+COMP)

Ba-lung-kurrka-	*warra-wurrka-*	*dulk-urrka-.*
west-fALL-fLOC.fOBL-T	far-fLOC.fOBL-T	far-fLOC.fOBL-T
south-ALL-PRES.COMP-Ø	far-PRES.COMP-Ø	far-PRES.COMP-Ø

'(The cyclone) is far away in the west.' [R2005-aug02a]

(B.71) Inflected for A-TAM:emotive, which attaches to VPβ (–COMP)

Niy-a	*warra--nyarra*	***ra-rung-inj***-.
3sg-T	go-TH-fAPPR-T	south-fALL-fOBL-T
3sg-Ø	go-Ø-APPR-Ø	south-ALL-EMO-Ø

'He might go south.' [W1960]

B.4.5 Ablative stem compass locational, as a predicate

(B.72) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Mutha-a	*yakuriy-a*	*ri-in-d.*
many-T	fish-T	east-fFRM-T
many-Ø	fish-Ø	east-ABL-Ø

'Many fish came from the east.' [E724]

(B.73) Inflected for A-TAM:prior which attaches to VP_{β} (–COMP)

Jina--na	*darr-i-na*	*nying-ka*	***jirrkaa-n-ki-na?***
what-fLOC-fABL-T	time-fLOC-fABL-T	2sg-T	north-fFRM-fLOC-fABL-T
what-Ø-PRIOR-Ø	time-Ø-PRIOR-Ø	2sg-Ø	north-ABL-Ø-PRIOR-Ø

'When did you come from the north?' [W1960]

(B.74) Inflected for A-TAM:present which attaches to VP_{β} (+COMP)

Ra-yin-da	*dii-ja*	*dathin,*	*ngiju-wa-*	***jirrkaa-n-kurrk-***
south-fFRM-T	sit-TH.T	there.T	1sg-COMP-T	north-fFRM-fLOC.fOBL-T
south-ABL-Ø	sit-IMP	there	1sg-COMP-Ø	north-ABL-PRES.COMP-Ø

'Sit (facing) from the south there, while I (sit) from the north.' [R2005-jul12c]

B.4.6 The reflexive pronoun *marin-*

(B.75) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Niy-a	***marin-da***	*mardalaa--j.*
3sg-T	self-T	paint-fMID-TH.T
3sg-Ø	self -Ø	paint-MID-ACT

'He is painting himself up.' [E353.ex.9-153; W1960]

(B.76) Inflected for A-TAM:emotive, which attaches to VPβ

Nal-da	***marin-inja-***	*kalaa---nyarr-.*
3sg-T	self-fOBL-T	cut-fMID-TH-fAPPR-T
3sg-Ø	self-EMO-Ø	cut-MID-Ø-APPR-Ø

'(She) might slash her head (in mourning).' [E354.ex.9-156]

(B.77) Inflected for A-TAM:future, which attaches to VPβ

Ki-l-da	*mardalaa--j-u-.*	***marin-ju-***
2-pl-T	paint-fMID-TH-fPROP-T	self-fPROP-T
2-pl-Ø	paint-MID-Ø-POT-Ø	self-FUT-Ø

'You'll paint yourselves.' [W1960]

B.4.7 *Jina-* 'where'

(B.78) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Nying-ka	***jina-a***	*warra-j?*
2sg-T	where-T	go-TH.T
2sg-Ø	where-Ø	go-ACT

'Where are you going?' [R2005-jul05b]

(B.79) Inflected for A-TAM:prior, which attaches to VPβ (–COMP)

Jina--na-	*nying-ka*	*wuu-j-arr-?*
where-fLOC-fABL-T	2sg-T	put-TH-fCONS-T
where-Ø-PRIOR-Ø	2sg-Ø	put-Ø-PST-Ø

'Where did you put it?' [W1960]

(B.80) Inflected for A-TAM:continuous, which attaches to VP_{γ}

Nying-ka	***jina-ntha-***	*wirdi--n-d?*
2sg-T	where-fOBL-T	stay-TH-fN-T
2sg-Ø	where-CONT-Ø	stay-Ø-PROG-Ø

‘Where are you staying?’ [R2007-may21]

B.4.8 *Jijina* ‘which direction’ #1

Example (B.81) is the only attested case of interrogative *jijina* ‘which direction’ inflecting for an A-TAM value which attaches to VPβ. See §B.6.5 for other examples.

(B.81) Inflected for A-TAM:prior, which attaches to VPβ (–COMP)

Nying-ka	***jijina--na-***	*warra-j-arra*	*wulji--na?*
2sg-T	which.way-fLOC-fABL-T	go-TH-fCONS-T	last night-fLOC-fABL-T
2sg-Ø	which.way-Ø-PRIOR-Ø	go-Ø-PST-Ø	small- Ø-PRIOR-Ø

‘Which way did you head last night?’ [E368.ex.9-213]

B.4.9 *Yan-* ‘now; soon’ #1

Yan- ‘soon’ can be a daughter of VPβ (shown here), or of VP_{γ} or VP_{δ} (shown in §B.6.4).

(B.82) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Nga-da	***yan-da***	*warra-j.*
1sg-T	now-T	go-TH.T
1sg-Ø	now-ø	go-ACT

‘I’m going now.’ [W1960]

(B.83) Inflected for A-TAM:future, which attaches to VPβ (–COMP)

Yan-ku-	*wirrka-j-u-*	*bi-l-da*	*ngimi-wu-*
soon-fPROP-T	dance-TH-fPROP-T	3-pl-T	night-fPROP-Ø
soon-FUT-Ø	dance-Ø-POT-Ø	3-pl-Ø	night-FUT-Ø

‘They will dance soon, at night.’ [W1960]

(B.84) Inflected for A-TAM:future, which attaches to VPβ (–COMP)

Dathina	*bantharra*	***yan-inja***-	*wirdi-j-inj-.*
that.T	others-T	now-fOBL-T	stay-TH-fOBL-Ø
that	others-Ø	now-EMO-Ø	stay-Ø-HORT-Ø

'These others should stay (here) now.' [R2005-jul21]

B.4.10 *Barruntha-* 'yesterday; in a while' #2

Barruntha- 'yesterday; in a while' acts either as a daughter of VP_{α} (shown in §B.2.8) or of VPβ (as shown here), in which case it inflects for CASE:locative.

(B.85) Inflected for CASE:locative, but not A-TAM in the context of A-TAM:directed, which attaches to VP_{α}

Nga-da	***barruntha-y-a***	*kurri-j-i-ri*
1sg-T	yesterday-fLOC-T	see-TH-fLOC-fALL.T
1sg-Ø	yesterday-LOC-Ø	see-Ø-Ø-DIR

ngij-in-ji-r	*kaja~kaja-r.*
1sg-fPOSS-fLOC-fALL.T	‹father_{NL}-father_{NL}›-fLOC-fALL.T
1sg-Ø-Ø-DIR	‹father›-Ø-DIR

'I saw my father yesterday.' [W1960]

B.5 Daughters of VP_{γ}

B.5.1 CASE:proprietive intentional objects and intentional destinations

CASE:proprietive intentional objects and intentional destinations are daughters of VP_{γ} and so do not inflect for any A-TAM values.

(B.86) Not inflected for A-TAM:instantiated, which attaches to VP$_{\alpha}$

Nga-da	*warra-ja*	***ba-lung-ku-*** .
1sg-T	go-TH.T	west-fALL-fPROP-T
1sg-Ø	go-ACT	west-ALL-fPROP-Ø

'I am going to the west.' (i.e., as my eventual destination)[E218.ex.5-68]

(B.87) Not inflected for A-TAM:directed, which attaches to VP$_{\alpha}$

Ba-lung-kuru-	*warra-j-i-r.*
west-fALL-fPROP-T	go-TH-fLOC-fALL.T
west-ALL-fPROP-Ø	go-Ø-Ø-DIR

'(We're) going to the west (as the eventual destination)' [R2006-aug10]

(B.88) Not inflected for A-TAM:future, which attaches to VP$_{\beta}$ (+COMP)

Damuru-uru-ntha-	*ngijuwa-*	*warra-j-uu-ntha-.*
corm-fPROP-fOBL-T	1sg.COMP-T	go-TH-fPROP-fOBL-T
corm-PROP-COMP-Ø	1sg.COMP-Ø	go-TH-POT-COMP-Ø

balmbi-wuu-nth-.
tomorrow-fPROP-fOBL-T
tomorrow-FUT-COMP-Ø
'I'll go for corms tomorrow.' [R2005-jul12c]

(B.89) Not inflected for A-TAM:prior, which attaches to VP$_{\beta}$ (–COMP)

Nga-da	*jani-j-arra-*	***ngum-ban-ju-*** .
1sg-T	seek-TH-fCONS-T	2sg-fPOSS-fPROP-T
1sg-Ø	seek-Ø-PST-Ø	2sg-Ø-PROP-Ø

'I searched for you'[E108.ex.3-29]

(B.90) Inflected for A-TAM:cont, which attaches to VP$_{\gamma}$

Niy-a	*jani--n-da*	***kunawuna-wuru-nth-*** .
3sg-T	seek-TH-fN-T	child-fPROP-fOBL-T
3sg-Ø	seek-Ø-PROG-Ø	child-PROP-CONT-Ø

'He is searching for the child.' [E412.ex.10-20]

B.5.2 CASE:proprietive transferred objects

(B.91) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Maku	*dun-maru-tha*	*wuu-ja*	***nguku-uru***- .
woman-T	husband-fDAT-TH.T	give-TH.T	water-fPROP-T
woman-Ø	husband-DAT-ACT	give-ACT	water-PROP-Ø

‘A woman gives water to her spouse.’ [E336.ex.9-95]

(B.92) Not inflected for A-TAM:emotive, which attaches to VP_{β} (+COMP)

Marndii---nyarra-nha-	*ngijuwa-*	***wuran-kuru-nth***- .
deprive-fMID-TH-fAPPR-fOBL-T	1sg.COMP-T	food-fPROP-fOBL-T
deprive-MID-Ø-APPR-COMP-Ø	1sg.COMP-Ø	give-PROP-COMP-Ø

‘I might be robbed of my food.’ [R2005-jul21]

(B.93) Not inflected for A-TAM:prior, which attaches to VP_{β} (–COMP)

Niy-a	*marndi-j-arra-*	*kanthathu--na-*	***wirrin-kuru***- .
3sg-T	deprive-TH-fCONS-T	father-fLOC-fABL-T	money-fPROP-T
3sg-Ø	deprive-Ø-PST-Ø	father-Ø-PRIOR-Ø	money-PROP-Ø

‘He took money off his father.’ [E420.ex.10-38]

(B.94) Inflected for A-TAM:cont, which attaches to VP_{γ}

Niy-a	*marndi--n-da*	*kanthathu-ntha-*	***wirrin-kuru-nth***- .
3sg-T	deprive-TH-fN-T	father-fOBL-T	money-fPROP-fOBL-T
3sg-Ø	deprive-Ø-PROG-Ø	father-CONT-Ø	money-PROP-CONT-Ø

‘He is taking money off his father.’ [E420.ex.10-39]

B.5.3 CASE:proprietive instrument DPs #2

CASE:proprietive instruments can appear as daughters of VP_{α} (shown in §B.2.3) or of VP_{γ} (shown here).

(B.95) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Nga-da	*burldi-ja*	*ni-wan-ji-*	***wangalk-uru-*** .
1sg-T	hit-TH.T	3sg-fPOSS-fLOC-T	boomerang-fPROP-T
1sg-Ø	hit-ACT	3sg-Ø-INS-Ø	boomerang-PROP-Ø

'I hit it with boomerang.' [W1960]

(B.96) Not inflected for A-TAM:future, which attaches to VP_{β} (+COMP)

Nga-ku-l-da	*burldi--nang-kuru-y-a*	***wangalk-uru-y-*** .
1-2-pl-T	hit-TH-fNEG-fPROP-fLOC-T	boomerang-fPROP-fLOC-T
1-2-pl-Ø	hit-Ø-NEG-POT-EMP-Ø	boomerang-FUT-EMP-Ø

'We can't hit them with boomerangs.' [W1960]

(B.97) Not inflected for A-TAM:prior, which attaches to VP_{β} (–COMP)

Nga-l-da	*kala-th-arra-*	***rawalan-ku-*** .
1-pl-T	cut-TH-fCONS-T	baler shell-fPROP-T
1-pl-Ø	cut-Ø-PST-Ø	baler shell-PROP-Ø

'We used to cut (things) with baler shells.' [E418.ex.10-34]

(B.98) Inflected for A-TAM:cont, which attaches to VP_{γ}

Nga-da	*kala--n-da*	*thungal-inja-*	***narra-kuru-nth-*** .
1sg-T	cut-TH-fN-T	tree-fOBL-T	knife-fPROP-fOBL-T
1sg-Ø	cut-Ø-PROG-Ø	tree-CONT-Ø	knife-PROP-CONT-Ø

'I am cutting down the tree with a shell knife.' [E418.ex.10-32]

B.5.4 CASE:proprietive 'subject matter' DPs

CASE:proprietive 'subject matter' DPs presumably are daughters of VP_{γ}, though the positive evidence available only shows that they are too high in the non-surface syntactic tree to inherit A-TAM features that attach to VP_{α}, i.e., they must be daughters of VP_{β} or higher.

(B.99) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Waa-ja *wirdi-ja* *nga-da* ***bijarrba-wuru.***
sing-TH.T stay-TH.T 1sg-T boomerang-fPROP-T
sing-ACT stay-ACT 1sg-Ø boomerang-PROP-Ø
'I am singing about a dugong..' [E148.ex.4-49]

(B.100) Not inflected for A-TAM:directed, which attaches to VP_{α}

Bi-rr-a *ra-nthu-th-i-r,* *wumburung-kuru--r*,
3-du-T spear-fRCP-TH-fLOC-fALL.T spear-fPROP-fLOC-fALL.T
3-du-Ø spear-RCP-Ø-Ø-DIR spear-PROP-Ø-DIR

dathin-kuru-wa ***maku-uru.***
that-fPROP-T that-fPROP-T
that-PROP-Ø that-PROP-Ø
'They are fighting one another with spears over that woman.' [W1960]

B.6 Daughters, ambiguously of VP_{γ} or VP_{δ}

B.6.1 CASE:ablative DPs

(B.101) CASE:ablative source
Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Nga-l-da *marri-ja* *kang-ki-* ***jungarra--na-***
1-pl -T hear-TH.T story-fLOC-T big-fLOC-fABL-T
1-pl-Ø hear-ACT story-INS-Ø big-Ø-ABL-Ø

dangka--na- .
person-fLOC-fABL-T
person-Ø-ABL-Ø
'We heard the story from the old people.' [E143.ex.4-35;605.line35.text8]

(B.102) CASE:ablative demoted human agent

Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Bijarrba-	*ra-yii-ja*	***dangka--na-.***
dugong-T	spear-fMID-TH.T	man-fLOC-fABL-T
dugong-Ø	spear-MID-ACT	man-Ø-ABL-Ø

‘The dugong is/was speared by the man.’ [E2.ex.1-6]

(B.103) Not inflected for A-TAM:future, which attaches to VPβ (–COMP)

Nga-da	*ra-yii-j-u-*	*mun-da*	***balarr-i-na-***
1sg-T	spear-TH-fPROP-T	buttocks-T	white-fLOC-fABL-T
1sg-Ø	spear-Ø-POT-Ø	buttocks-Ø	white-Ø-ABL-Ø

maku--na-
woman-fLOC-fABL-T
woman-Ø-ABL-Ø

‘I will be injected in the buttocks by the white woman.’ [E350.ex.9-134b]

(B.104) Not inflected for A-TAM:antecedent, which attaches to VPβ or VP_{γ} (available data underdetermines which node precisely)

Jina-a	*kuna~wun-*	*kinyilii---n-ngarrba-*
where-T	‹child$_{NL}$-child$_{NL}$›-T	deliver-fMID-TH-‹fN-fCONS›-T
where-ø	‹child›-Ø	deliver-MID-Ø-‹ANTE›-Ø

marrkathu--na- .
FaSi-fLOC-fABL-T
FaSi-Ø-ABL-Ø

‘Where is the child who was delivered by aunty?’ [E144.ex.4-42]

B.6.2 Ablative stem compass locationals

(B.105) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Ra-yin-da	*thula-tha*	*tharda-a*	*manarr-u-.*
south-fFRM-T	descend-TH.T	shoulder-T	torch-fPROP-T
south-ABL-Ø	descend-ACT	shoulder-Ø	torch-PROP-Ø

‘He came down [from the south –ER] to the sea with a bark torch on his shoulder.’ [E724]

(B.106) Not inflected for A-TAM:directed, which attaches to VP$_{\alpha}$

Ra-yin-da	*thaa-th-i-r.*
south-fFRM-T	return-TH-fLOC-fALL.T
south-ABL-Ø	return-Ø-Ø-DIR-Ø

'(The bird) is returning from the south.' [R2006-oct19]

(B.107) Not inflected for A-TAM:present, which attaches to VP$_{\beta}$ (+COMP)

Kada-wurrka-	***bath-in-inja-***	*dali-j-urrk-*
again-fLOC.fOBL-T	west-fFRM-fOBL-T	come-TH-fLOC.fOBL-T
again-PRES.COMP-T	west-ABL-COMP-Ø	come-Ø-IMMED.COMP -Ø

'Because it will come again from the west' [R2005-aug02a]

(B.108) Not inflected for A-TAM:future, which attaches to VP$_{\beta}$ (–COMP)

Maraka	*ri-in-da*	*wanjii-j-u-*	*ni-.*
CTRFCT	east-fFRM-T	ascend-TH-fPROP-T	3sg-T
CTRFCT	east-ABL-Ø	ascend-Ø-POT-Ø	3sg-Ø

'He should have come up from the east.' [R2007-may22]

B.6.3 Counted occasion & unit duration DPs

DPs refering to counted occasions, or durations measured in units are daughters of VP$_{\gamma}$ or VP$_{\delta}$, with the exception of thoses whose NP is head by *darr-* 'occasion; time' (on which, cf §B.2.6).

(B.109) Not inflected for A-TAM:instantiated, which attaches to VP$_{\alpha}$

Jinamulu-	***warrku-wa***	*karrngi-ja*	*wuran-ki-?*
how many-T	day-T	keep-TH.T	food-fLOC-T
how many-ø	day-ø	keep-ACT	food-INS-Ø

'How many days do you keep the food?' [R2005-jul12c]

(B.110) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Nga-da	*bala-tha*	*ni-wan-ji-*	***warngii-da***	***birrjil-k.***
1sg-T	hit-TH.T	3sg-fPOSS-fLOC-T	one-T	occasion-T
1sg-Ø	hit-ACT	3sg-Ø-INS-Ø	one-ø	occasion-ø

'I hit him one time.' [E656]

(B.111) Not inflected for A-TAM:future, which attaches to VPβ (–COMP)

Dan-ku-	*nga-ku-l-da*	*yiiwi-j-u-*
here-fPROP-T	1-2-pl-T	sleep-TH-fPROP-T
here-Ø-FUT-Ø	1-2-pl-ø	sleep-Ø-FUT-Ø

warngii-da	***ngimi-,***	*karba-karba-ru-th-u-.*
one-T	night-T	‹dry_{NL}-dry_{NL}›-fAWAIT-TH-fPROP-T
one-ø	night-ø	‹heal›-AWAIT-Ø-FUT-Ø

'We'll sleep here one night until she's healed.' [R2005-jul21]

(B.112) Not inflected for A-TAM:prior, which attaches to VPβ (–COMP)

Dan-ki-na-	*nga-da*	*kurri-j-arra-*	*ni-wan-ji-na-*
here-fLOC-fABL-T	1sg-T	see-TH-fCONS-T	3sg-fPOSS-fLOC-fABL-T
here-Ø-PRIOR-Ø	1sg-Ø	hit-Ø-PST-Ø	3sg-Ø-Ø-PRIOR-Ø

kiyarrng-ka	***birrjil-k.***
two-T	occasion-T
two-ø	occasion-ø

'I saw her here twice.' [R2005-jun29]

B.6.4 *Yan-* 'now; soon' #2

Yan- 'soon' can be a daughter of VPβ (shown in §B.4.9), or of VP_{γ} or VP_{δ} (shown here).

(B.113) Not inflected for A-TAM:future, which attaches to VP_{β} (–COMP)

Yan-d,	*nga-ku-lu-wan-ju-*	*kurri-j-u-*	*wara-th-u-*
soon-T	1-2-pl-fPOSS-fPROP-T	look-TH-fPROP-T	send-TH-fPROP-T
soon-Ø	1-2-pl-Ø-FUT-T	look-Ø-POT-Ø	send-Ø-POT-Ø

ba-lung-ku-.
west-fALL-fPROP-T
west-ALL-FUT-Ø
'Now they are looking out at us as we go westwards.' [E310.ex.8-58]

(B.114) Not inflected for A-TAM:future, which attaches to VP_{β} (+COMP)

Yan-inja-	*balaa--j-uu-ntha-*	*walmathi-wuu-nth-*
soon-fOBL-T	kill-fMID-TH-fPROP-fOBL-T	above-fPROP-fOBL-T
soon-COMP-Ø	kill-MID-Ø-POT-COMP-Ø	above-FUT-COMP-Ø

'They would soon be killed up above.' [E1984-03-01]

B.6.5 *Jijina* 'which direction' #2

One example of *jijina* exists in which it inflects for an A-TAM value which attaches to VP_{β} (§B.4.8). Here, it does not.

(B.115) Not inflected for A-TAM:instantiated, which attaches to VP_{α}

Jijina	*kurrngu- ?*
which direction-T	dugong's feeding path-T
which direction-Ø	dugong's feeding path-Ø

'Which direction is the dugong moving?' [E224.ex.5-92]

(B.116) Not inflected for A-TAM:future, which attaches to VP_{β} (–COMP)

Nying-ka	***jijina***	*warra-j-u- ?*
2sg-T	which direction-T	go-TH-fPROP-T
2sg-Ø	which direction-Ø	go-Ø-POT-Ø

'Where are you going?' [E368.ex.9-212]

(B.117) Not inflected for A-TAM:emotive, which attaches to VP$_\beta$ (–COMP)

Niy-a	***jijina***	*warra-d-- ?*
3sg-T	which direction-T	go-TH-fDES-T
3sg-Ø	which direction-Ø	go-Ø-DES-Ø

'Which way should he go?' [E160.ex.4-98; W1960]

B.7 Daughters of VP$_\delta$

B.7.1 CASE:associative DPs

(B.118) CASE:associative location

Not inflected for A-TAM:instantiated, which attaches to VP$_\alpha$

Nga-l-da	*wirdi-ja*	***wunkurr-nurru-,***	*nathaa.*
1-pl -T	stay-TH.T	grass shelter-fASSOC-T	camp-T
1-pl-Ø	stay-ACT	grass shelter-ASSOC-Ø	camp-Ø

'We stayed under grass shelters at our camps.' [W1960]

(B.119) CASE:associative comitative

Not inflected for A-TAM:instantiated, which attaches to VP$_\alpha$

Ngij-in-urru-	***thabuju-rnurru-***	*niy-a*	*warra-j.*
1sg-fPOSS-fASSOC-T	e.Br-fASSOC-T	3sg-T	go-TH.T
1sg-POSS-ASSOC-Ø	e.Br-ASSOC-Ø	3sg-Ø	go-ACT

'She's going (there) with my big brother.' [E155.ex.4-78]

(B.120) CASE:associative accoutrement

Not inflected for A-TAM:directed, which attaches to VP$_\alpha$

Dathina	*dangka-a*	*jawi-j-i-ri*	***ngij-in-urruw-a***
that.T	man-T	run-TH-fLOC-fALL.T	1sg-fPOSS-fASSOC-T
that	man-Ø	run-Ø-Ø-DIR	1sg-POSS-ASSOC-Ø

wangal-nurruw-a	*ngiju-wa-*	*kurri-j-arra-nth-.*
boomerang-fASSOC-T	1sg-fCOMP-T	see-TH-fCONS-fOBL-T
boomerang-ASSOC-Ø	1sg-COMP-Ø	see-Ø-PST-COMP-Ø

'That man who I see is running with my boomerang.' [W1960]

(B.121) CASE:associative accoutrement

Not inflected for A-TAM:prior, which attaches to VP$_{\beta}$ (–COMP)

Nying-ka	***ngi-nurruw-a***	*dali-j-arr-,*	*kuwan-marra--na-?*
2sg-T	wood-fASSOC-T	come-TH-fCONS-T	fire stick-fUTIL-fLOC-fABL-T
2sg-Ø	wood-ASSOC-Ø	come-Ø-PST-Ø	fire stick-UTIL-Ø-PRIOR-Ø

'Have you brought wood for firesticks?' [E160.ex.4-98; W1960]

(B.122) CASE:associative comitative

Not inflected for A-TAM:future, which attaches to VP$_{\beta}$ (–COMP)

Nga-ku-lu-wan-urruw-a	*bi-l-da*	*wirrka-j-u-.*
1-2-pl-fPOSS-fASSOC-T	3-pl-T	dance-TH-fPROP-T
1-2-pl-Ø-ASSOC-Ø	3-pl-Ø	dance-Ø-POT-Ø

'They'll dance with us (i.e. when we get there).' [E155.ex.4-79]

(B.123) CASE:associative accoutrement

Not inflected for A-TAM:continuous, which attaches to VP$_{\gamma}$ (–COMP)

Bi-l-da	*dali--n-da*	***ngi-nurruw-a***	*kuwan-marra-nth-.*
3-pl-T	come-TH-fN-T	wood-fASSOC-T	fire stick-fUTIL-fOBL-T
3-pl-Ø	come-Ø-PROG-Ø	wood-ASSOC-Ø	fire stick-UTIL-CONT-Ø

'They are coming with wood for the fire.' [E362.ex.9-178]

B.7.2 CASE:genitive demoted inanimate cause DPs

(B.124) Not inflected for A-TAM:continuous (within subordinate clause), which attaches to VP$_{\gamma}$

Jangka-wu-	*darr-u-*	***kamarr-karra***	*balaa---n-d .*
other-fPROP-T	occasion-fPROP-T	stone-fGEN.T	hit-fMID-TH-fN-T
other-FUT-Ø	occasion-FUT-T	stone-GEN	hit-MID-Ø-PROG-Ø

'Another time (your head)'ll get broken on a stone.' [E473.ex.11-31]

B.7.3 *Kada* 'again' #2

Kada was seen previously, in §B.2.5 where it was the daughter of VP$_{\alpha}$. Here, it sits in a different position as the daughter of VP$_{\delta}$.

(B.125)	Not inflected for A-TAM:instantiated, which attaches to VP$_{\alpha}$			
	Kada	*wara-tha*	*rulung-ka*	*wululbu-y-* .
	again.T	throw-TH.T	east.fALL-T	bait-fLOC-T
	again	throw-ACT	eact.C.ALL-Ø	bait-INS-Ø
	'He threw the bait eastwards again' [E781]			

(B.126)	Not inflected for A-TAM:future which attaches to VP$_{\beta}$ (–COMP)			
	Kada	*rabi--nang-ku-,*	*dulk-uru*	*dii-j-u-.*
	again.T	arise-TH-fNEG-fPROP-T	ground-fPROP-T	sit-TH-fPROP-T
	again	arise-Ø-NEG-POT-Ø	ground-FUT-Ø	sit-Ø-POT-Ø
	'He won't get up again, he'll stay on the ground.' [W1960]			

(B.127)	Not inflected for A-TAM:future which attaches to VP$_{\beta}$ (+COMP)			
	Nga-da	*mungurru-,*	***kada-ntha-***	*thaa-th-uu-nth-.*
	1sg-T	know-T	again-fOBL-T	return-TH-fPROP-fOBL-T
	1sg-Ø	know-Ø	again-COMP-Ø	return-Ø-POT-COMP-Ø
	'I know that I will come back (here) again.' [E490–91.ex.12-7]			

(B.128)	Not inflected for A-TAM:continuous, which attaches to VP$_{\gamma}$		
	Kada	*ngaaka-ntha-*	*kurri--n-d?*
	again.T	who-fOBL-T	look at-TH-fN-T
	again	who-CONT-Ø	look at-Ø-PROG-Ø
	'Who's he looking at again?' [R2005-jul21]		

In (B.129), *kada* is not inflected, even for COMP:empathy. It would appear that *kada* is functioning as a particle, hence escapes inflection. An alternative would be to propose that *kada* is topicalised, but as discussed in Ch.6, §§6.5.1.2; 6.5.5.1, usually only DPs which can be complements of V can be topicalised, and there is no evidence that *kada* is ever a complement of V.

(B.129) Not inflected for A-TAM:future which attaches to VP_{β}, nor for +COMP

Kada *marri-j-uru-y-.*
again.T listen-TH-fPROP-fLOC-T
again listen-Ø-POT-EMP-Ø
'We should listen again.' [2007-may21]

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