Auxiliary placement in Rangi:
A Dynamic Syntax perspective

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Declaration

I hereby certify that this thesis is the result of my own research and that none of the chapters included have been submitted to any other institution for the fulfillment of a degree. Where information has been derived from other sources, I confirm that this has been indicated.

Signed:_____ Date:_____

Abstract

The Tanzanian Bantu language Rangi is unusual in that it exhibits a construction in which an infinitival verb form precedes an inflected auxiliary. This ordering of the infinitive with respect to the auxiliary is marked within the context of East African Bantu. It also contradicts Greenberg's (1963) proposed linguistic universal that Subject Verb Object languages exhibit auxiliary-infinitive order. Whilst the infinitive precedes the auxiliary in main declarative clauses, auxiliary-infinitive order is found in negative, interrogative and cleft constructions, as well as in relative and subordinate clauses.

This thesis examines infinitive-auxiliary order in Rangi, providing a detailed description of the structure and contexts in which the construction is used. Based on this, a formal analysis is developed from the perspective of Dynamic Syntax (Kempson et al. 2001; Cann et al. 2005b) – a framework which models the establishment of propositional structure by focusing on the dynamics of the parsing/production process in a time-linear manner. The infinitive-auxiliary order is captured by adopting an analysis in which infinitival verb forms are projected onto an unfixed predicate node. In contrast, auxiliaries project fixed minimal predicate-argument structure and introduce temporal information. The alternation auxiliary-infinitive order is subsequently analysed as resulting from the presence of an unfixed node.

The analysis presented depends on the independent restriction operative in the Dynamic Syntax framework under which two unfixed nodes of the same modality cannot co-exist. This restriction is the result of the two nodes being defined identically in terms of tree logic. The presence of an unfixed node is taken as a trigger for the auxiliary-infinitive order, whilst the infinitive-auxiliary order is found in the absence of this trigger. A formal definition of the rule of PREDICATE ADJUNCTION is presented. The analysis provides further support for the availability of the building and re-building of the same structure within a semantic tree which is permissible in Dynamic Syntax. The thesis interrogates the extent to which similar syntactic contexts can be seen to motivate, and inform, distributional properties of similar (and distinct) elements in languages in unrelated language families.

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Figures and tables

Abbreviations

1, 2, 3 etc.	noun class 1, 2, 3 etc.
1st sg	first person singular etc.
2nd pl	second person plural etc.
APPL	applicative
AUX	auxiliary
CAUS	causative
CJ	conjoint
CON	construct case
COND	conditional
CONN	conjunction
CONT	continuous
CNTREXPECT	counter-expectational
CSEC	consecutive
COP	copula
DEM	demonstrative
DET	determiner
DIST	distal
F	feminine
FV	final vowel
FUT	future
GEN	genitive
HAB	habitual
IMP	imperative
IMPFV	imperfective
INF	infinitive
IRR	irrealis
lit.	literal
LOC	locative
NEG	negative
NEUT	neuter
NOM	nominaliser
OBJ	object concord
OPT	optative
p.c.	personal correspondence
PASS	passive
PAST	past
PAST1	recent past
PAST2	distant past
PERF	perfect
pl	plural
PP	personal pronoun
PRES	present
PROG	progressive
PROX	proximal
PVT	perfective
REC	reciprocal

REF	referential
REFL	reflexive
RETR	retrospective
SC	subject concord
sg	singular
SM	subject marker
SEP	seperative
SEQ	sequential
STAT	stative
UNAC	unaccomplished

1 Introduction

1.1 The Rangi language

Rangi is a north-eastern Bantu language spoken in the northern region of central Tanzania. The majority of the Rangi people live in the Kondoa District – in Kondoa town and the surrounding villages. Estimates of the number of Rangi-speakers range from 270,000 (Bergman et al. 2007) to 310,000 (Gordon 2005), whilst Cox and Stegen (2007) calculate the Rangi-speaking population to be as high as 420,000.[1] Of these, 35,000 are estimated to be monolingual speakers of Rangi whilst many ethnic Burunge and some ethnic Alagwa also have Rangi as their first language (Gordon 2005).

The Dodoma-Arusha road – the main road of the district – cuts through Rangi-land. Rangi populations are found in all the villages along and beside this road, from Kidoka (60 kilometers south of Kondoa) to Bereko (60 kilometers north of Kondoa). Sizeable Rangi-speaking communities are also found in the northern city of Arusha and the coastal city of Dar es Salaam. In both instances the formation of these communities outside of Rangi-land is due to economically-driven rural-to-urban migration, often associated with perceived increased employment opportunities and better living standards in these cities.

Rangi is the largest linguistic group in the Babati-Kondoa region, which is home to more than 40 languages (Grimes 2000; Dunham 2005). In addition to Rangi, the main languages represented in this area of high linguistic diversity are the Cushitic languages Iraqw, Burunge, Gorowa, Alagwa, the Nilotic languages Datooga and Maasai, the Khoisan language Sandawe[2] and the Bantu languages Mbugwe, Gogo and Chaga (Grimes 2000). The Rift Valley area of central and northern Tanzania is unique in being the only area in Africa where languages

[1] This higher figure is supported by the findings of the 2002 Tanzanian census which gave the population of Kondoa District as 428,090, indicating that the Rangi population may have reached 400,000 (Stegen 2011).

[2] There has however been some debate about the exact nature of the relation between the Tanzanian languages Sandawe and Hadza, and the Khoisan languages of southern Africa. For claims against the connection between Sandawe and Hadza and Khoisan see Westphal (1971:401) and Wright et al. (1995:1). For support of the connection between these languages see Ehret (1986) and Elderkin (1986;1989).

from all four African language phyla are found (Heine and Nurse 2000). As such, it is an area with a sustained history of language contact and has long been characterised by patterns of bi- and multi-lingualism as well as language shift between smaller and larger groups (Kießling et al. 2007). All linguistic observations of Bantu and Cushitic languages in this area indicate that there has been much interaction between the different languages. The nature of this contact is further characterised by the fact that the languages in this area come from different language families and represent widely different language types. In terms of basic word order for example, the Cushitic and Khoisan languages are SOV languages, the Bantu languages are typically SVO, whilst the Southern Nilotic language Datooga exhibits a predominantly VSO constituent order (Kießling et al. 2007:189).

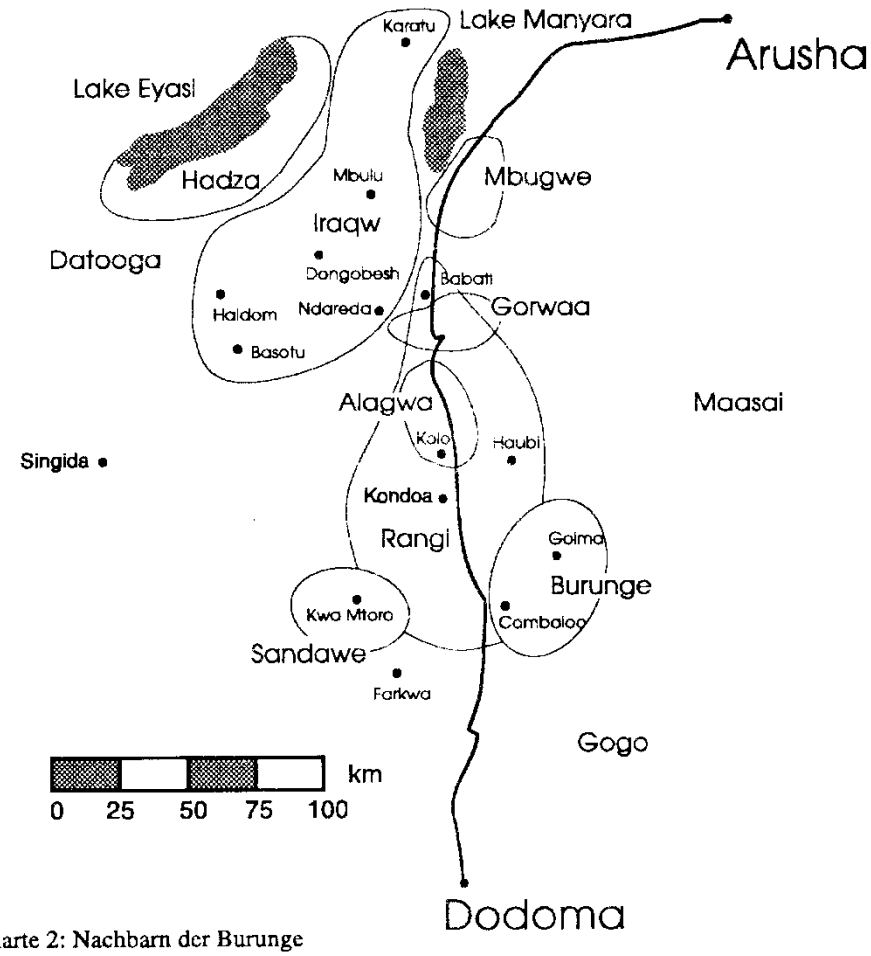
Despite the observation that 'Rangi is not obviously unambiguously related to any other East African group' (Nurse 1999:11), Rangi has been classified as F33 following Guthrie (1967–71:II:48) and the revised Guthrie system outlined in Maho (2003:646).[3] Closely related languages include Nyaturu (Rimi), Sukuma, Nyamwezi, Kimbu, Nilamba and Sumbwa, all of which are classified under Guthrie's (1967–71) F branch. The language most closely related to Rangi is Mbugwe (F34). Mbugwe is spoken in the town of Magugu, which is also located further north on the Dodoma-Arusha road, in the Babati District of Arusha Province.

The Rangi- and Mbugwe-speaking communities have a long historical connection and are thought to have moved into the Central District from the same region. Bergman et al. (2007) estimate 52% lexical similarity between Rangi and Mbugwe, whilst Grimes (2000) puts this number at 74%. Today the Rangi and Mbugwe people are separated by speakers of the Cushitic language Gorwaa who live in the area between these two communities. Mbugwe is of interest to the current study since Mbugwe also exhibits the infinitive-auxiliary

[3] These numerical classifications follow Guthrie (1971) and are used to provide an indication of geographic proximity of languages and, by implication, in some instances also an indication of genetic relatedness. See Maho (1999; 2003) for detailed discussion of classification codes for Bantu languages.

construction in restricted syntactic contexts, albeit in different tenses from those in which it is found in Rangi.[4] A number of the languages spoken in the region of central Tanzania where Rangi is also found are shown in the map (from Kießling (1994)) in Figure 1.

Figure 1: A linguistic map of Central Tanzania



Karte 2: Nachbarn der Burunge

Although there are a number of dialects of Rangi, the main dialectal difference perceived by Rangi-speakers is between Highland Rangi (spoken in Haubi) and Lowland Rangi (spoken elsewhere). Further sub-divisions are made within Lowland Rangi, between the dialects spoken in Busi, Mondo, Kondoa, Kolo and

[4] Mous (2000; 2004) notes the infinitive-auxiliary order is attested in the present progressive, future, habitual and past imperfective verb forms in Mbugwe. Vera Wilhemsen (personal correspondence) notes that the infinitive-auxiliary order is found in Mbugwe in recent past progressive, distant past progressive, present progressive and habitual verb forms.

Bereko. This thesis focuses primarily on the Kondoa and Haubi varieties of Rangi. This decision is motivated by the fact that the Kondoa dialect is considered to be the most widely understood dialect, and a large number of Rangi-speakers have spent at least some time living, studying or working in Kondoa Town. As the main economic centre of the region, Kondoa is the current home to many Rangi-speakers. As such, the Rangi spoken here has assumed something of a 'standard' status. However, since Kondoa is the main town in the region, it is also home to a number of people from different ethno-linguistic groups. This linguistic diversity, coupled with the dominance of Swahili throughout Tanzania, means that the Kondoa Town dialect of Rangi is considered by some to be diluted and to show signs of influence from these other languages, particularly Swahili. The second dialect under consideration in the current study is the Haubi dialect. This is considered by many to be the most prestigious dialect of Rangi and in a number of the traditional narratives, Haubi is described as the first place the Rangi people settled when they arrived in their present day home. As such, Haubi was chosen as the site of the majority of the fieldwork conducted in the 2009–2010 research trip.

The language under examination in the current thesis is known variously as Rangi, Langi, Kirangi and Kɨlaangi. Whilst Kɨlaangi is the term of self-reference, Kirangi is how the language is referred to in Swahili. Dunham (2004; 2005) uses the term Langi – an anglicized version of the self-referent – in her work. The language name Rangi is employed throughout this thesis, following the work of Stegen (2001; 2002; 2011) and the increasing use of this term in the wider literature.

1.2 Previous studies

Previous studies of Rangi have been primarily ethno-linguistic (Seidel 1898; Dempwolff 1916; Kesby 1986; Kesby 1996) or morphological (Stegen 2002; Dunham 2004; 2005) in nature. There are two main sources of Rangi data. One is the published 2005 doctoral thesis by Margaret Dunham entitled *Eléments de description du langi: language bantu F.33 de Tanzanie; phonologie, grammaire, lexique*. This thesis focuses primarily on Rangi phonology and verbal morphology, although a number of features of Rangi grammar are also discussed. The second main source of Rangi data is the 2011 doctoral thesis by Oliver

Stegen entitled *In quest of a vernacular writing style for the Rangi of Tanzania: Assumptions, processes, challenges*. This study provides an in-depth analysis of Rangi narratives with the aim of providing an appropriate Rangi orthography. There is also a Master's thesis which examines Rangi grammar (Akhavan-Zandjani 1990) and a number of articles that consider more specific aspects of the Rangi language. These articles include Stegen (2001), which looks at the functions of auxiliaries and the copula; Stegen (2002), which examines Rangi derivational processes and Dunham (2004), which considers the Rangi verbal system as a whole. Stegen (2004) looks at Rangi orthography development, Stegen (2005) discusses Rangi literature production and Stegen (2007) examines lexical density in Rangi narratives. Whilst none of these contain a formal analysis of Rangi syntax, they do provide an examination of specific aspects of Rangi and in some cases a number of examples and texts exemplifying language use in context. Since no comprehensive examination of Rangi syntax has previously been undertaken, this thesis provides a thorough description of Rangi clause structure, with a focus on auxiliary placement and the infinitive-auxiliary construction.

1.3 Auxiliary placement in Rangi

Rangi has come to the attention of linguists as a result of the unusual infinitive-auxiliary constituent order found in the future tense. Not only is this infinitive-auxiliary order unusual in the context of East African Bantu, it appears to contradict Greenberg's (1963:84) proposed linguistic universal that verb-object languages exhibit auxiliary-infinitive order. The infinitive-auxiliary order is found in the immediate future tense and the general future tense. As can be seen on examination of the examples below, these tenses are formed using an infinitival verb in conjunction with an inflected auxiliary. In the case of the general future tense, the auxiliary is an inflected form of the auxiliary *-ri* (1) whilst the immediate future tense is formed using the auxiliary *-ísе* (2). In both instances the infinitive consistently precedes the auxiliary and the preverbal placement of the auxiliary results in ungrammaticality (3).[5]

[5] For a list of abbreviations used throughout this thesis please refer to page 11.

(1) weéwe rín-a ú-r~~ɨ~~ ~~ɨ~~-h~~ɨ~~ m~~ɨ~~-r~~ɨɨ~~nga
2nd sg.PP open-FV SM2nd sg-AUX DEM-4 4-beehive
'You will open these beehives'

(2) háánd-a tw-íise m~~ɨ~~-disi
plant-FV SM1st pl-AUX 4-banana.plant
'We will plant banana plants'

(3) *nd~~ɨ~~-r~~ɨ~~ térek-a chá-k~~u~~rya
SM1st sg-AUX cook-FV 7-food
'I will cook food'

Whilst the infinitive precedes the auxiliary in main affirmative clauses, the auxiliary-infinitive order is found in negatives, wh-interrogatives, relative and subordinate clauses and certain cleft constructions. This can be seen in example (4) below, where the order auxiliary-infinitive is found following the wh-expression *ani* 'who'.

(4) ani á-r~~ɨ~~ rín-a ~~ɨ~~-h~~ɨ~~ m~~ɨ~~-r~~ɨɨ~~nga ?
who SM1-AUX open-FV DEM-4 4-beehive
'Who will open this beehive?'

The account of auxiliary placement in Rangi presented in this thesis is formalised from the perspective of the Dynamic Syntax framework (Kempson et al. 2001; Cann et al. 2005b). Dynamic Syntax (DS) is a grammar formalism that reflects the dynamics of parsing and uses binary semantic trees to represent the incremental establishment of propositional content which results from parsing utterances in context, on a left-to-right basis. The analysis will show that the semantic and structural contributions made by auxiliary constructions are determined by the lexical information encoded therein, and that their interpretation is dependent on the triggering conditions that are present at the point at which they are parsed. This thesis shows that both the marked infinitive-auxiliary order and the alternative auxiliary-infinitive order found in Rangi can be captured by reference to underspecification – a central concept in the DS framework. The thesis also contributes to the typological study of Bantu syntax and Bantu clause structure and word order variation in particular. In so doing, it adds to the growing body of literature which addresses Bantu syntax.

1.4 Objectives of the thesis

There are two primary objectives of this thesis. The first objective is the provision of a detailed synchronic descriptive account of auxiliary placement in the Tanzanian Bantu language Rangi. Since Rangi is under-documented, the provision of a descriptive account of Rangi syntax is aimed at adding to the body of descriptive literature which describes the language. In addition to this, post-verbal auxiliary placement in Rangi is of interest from a comparative typological perspective since and it is unusual, both in the context of East African Bantu languages and cross-linguistically. By providing a description of Rangi clause structure, this thesis aims to add to the growing body of literature examining Bantu syntax, as well as providing further descriptive detail on an erstwhile under-described language.

The second objective of this thesis is the formal modelling of the marked infinitive-auxiliary order found in Rangi from the perspective of the Dynamic Syntax framework. The DS framework is adopted for its powers as a parsing-oriented framework and its ability to model complex data such as those which will form the basis of the analysis presented in Chapters 5 and 6. Employing the DS framework in the formal modelling of the marked infinitive-auxiliary construction in Rangi is also done with the aim of probing the theoretical framework and seeing to what extent it is able to capture the phenomena found in Rangi. The analysis will show that auxiliary placement in Rangi future tense constructions is regulated by the processing strategy used. Specifically, it will show that the auxiliary-infinitive order is found in the presence of an unfixed node, whilst the infinitive-auxiliary order is found in the absence of such a trigger.

The analysis I present for Rangi auxiliary placement will provide further evidence in support of the availability of re-building the same structure within a semantic tree. Whilst the permissibility of such an option in Dynamic Syntax has previously been assumed, the analysis presented in this thesis is dependent on such a possibility and provides further evidence in support of this option.
The analysis employed also results in employing similar strategies to model apparently distinct phenomena across distinct language groups.

1.5 Methodology and corpus

The data used in this thesis are based on research carried out during two fieldtrips. The first of these was conducted in the Kondoa region between October 2009 and May 2010. The second research trip was conducted in both the Kondoa and Dodoma regions in October and November 2011. The majority of data in the first fieldtrip were collected via elicitation through semi-structured interviews conducted in the village of Haubi. The data in the second fieldtrip were collected in the city of Dodoma as well as in Kondoa town and the village of Itololo. This thesis also contains data collected in the villages of Pahi and Iduurwi. Unless otherwise stated, the data contained within this thesis are the result of my own data collection.

My primary informant during the first fieldwork trip was a retired civil servant called Leonard Mavere who was born in 1940. He is a native of Haubi, where he has lived for the majority of his life except for periods of time spent in Morogoro and Dodoma. Rangi is his mother tongue and, living in Haubi, he uses Rangi as his primary language of communication on a day-to-day basis with his family and with other members of the community. He is also fluent in Swahili and has a good command of English, which he learnt at school and used for official purposes whilst working for the government.

During the second fieldtrip I worked with Florentina Mbuva. Also a native of Haubi, Mrs Mbuva is now based in Dodoma where she lives with her family. I also worked with Fransisca Dossa and Angela Aloisi Kitula, both of whom are from Haubi but now live in Kondoa. I also received help and clarification on a number of areas of Rangi grammar and clause structure from Amelia Issaka, who was living in Haubi during my 2009–10 visit but who was based at the Summer Institute of Linguistics (SIL) Rangi project in Dodoma by the time of my 2011 fieldtrip. Other informants consulted include Paolo Kijuu and Yovini Maingu, who are part of the SIL Rangi project based in Dodoma. Both Kijuu and Maingu are from Haubi and maintain strong links and regular contact with family and community members still based in the village. They also live in areas of Dodoma predominantly occupied by Rangi-speakers.

I have also worked with a native Rangi-speaker called Vanessa Nyere who grew up in the Soweto district of Kondoa Town. Originally from Haubi, where her parents still live, Vanessa currently lives in Preston, UK. I consulted Vanessa in order to cross-check data and seek further explanation and contextualisation of data I had attained whilst in Tanzania. I was granted access to an online corpus of texts curated by Margaret Dunham. Part of the *Langues et civilization à tradition orale* project, the Langi Corpus comprises texts recorded in Kondoa, Pahi and Piriri in 1996, 2003 and 2004 by Margaret Dunham. Data from this corpus is indicated by a unique identifier beginning with MD (for Margaret Dunham) and followed by the initials of the title of the text and a number indicating the line in the corpus from which the example is taken. The corpus can be accessed at http://lacito.vjf.cnrs.fr/archivage/languages/Langi_en.htm.

Rangi has no official status or function in the Tanzanian formal education system and there is no standard orthography. Oliver Stegen and members of the SIL Rangi project, together with members of the Rangi-speaking community, continue to develop an orthography for Rangi. The data in this thesis are presented in a modified form of the SIL orthography. This orthography is based on that employed for Standard Swahili. The main deviation from the Swahili orthography occurs in accounting for the Rangi 7-vowel system in which both long and short forms of the vowels [a], [e], [i], [ɪ], [o], [u] and [ʊ] are found. Throughout the thesis, the vowels [ɪ] and [ʊ] are represented orthographically as ɨ and ʉ respectively – as is being used in the trial Rangi orthography.

1.6 Structure of the thesis

The thesis is divided into two sections. The first section is descriptive in nature and is comprised of Chapters 2 and 3, whilst the second section has a theoretical focus and is comprised of Chapters 4, 5 and 6. Since Rangi is an under-documented language, Chapter 2 presents a grammar sketch of Rangi, providing an overview of Rangi phonology as well as the verbal and nominal morphology and a number of key features of Rangi morphosyntax. Chapter 3 provides a detailed examination of Rangi auxiliary constructions, looking at the function and distribution of copulas and auxiliaries in the language and their use in the

formation of compound constructions. In addition to contributing to the typological study of Bantu languages, the descriptive section of this thesis lays the foundation for the analysis of auxiliary-based constructions which comprises the focus of the second half of the thesis.

Chapter 4 provides an overview of Dynamic Syntax, presenting the tools and mechanisms of representation made available in the framework. It discusses the issues that are central to Dynamic Syntax analyses of Bantu languages, drawing on previous studies of Bantu clause structure, before focusing on the issues that are pertinent to the modelling of Rangi. In Chapter 5 a formal characterisation of the infinitive-auxiliary order found in Rangi from the perspective of Dynamic Syntax is presented. Chapter 6 provides the formal account of the alternation contexts – the contexts in which the future tenses are associated with the auxiliary-infinitive order. Chapter 7 constitutes a conclusion to the thesis, summarising the issues that arose from the preceding analyses. Chapter 7 also presents a number of outstanding questions that arise from the thesis and suggests possible directions for future research.

2 A grammatical sketch of Rangi

2.1 Introduction

Chapter 2 provides an introductory Rangi grammar sketch. The motivation for this is two-fold. Firstly, this is done with the aim of providing additional descriptive material to the body of literature on Rangi. In so doing, this section builds on the work of Stegen (2001; 2002; 2006; 2011) and Dunham (2004; 2005), extending this to provide further empirical coverage. Since no comprehensive analysis of Rangi syntax has previously been provided, Chapter 2 aims to provide a descriptive overview of Rangi and an overdue description of Rangi syntax. The second motivation for providing a grammatical sketch of Rangi is to provide the necessary background for understanding the analysis of infinitive-auxiliary constructions, which comprises the theoretical and analytical focus of this thesis.

The current chapter presents the basic elements of Rangi phonology and morphosyntax, including the noun class system, nominal derivation and nominal morphology, before going on to examine Rangi verbal morphology and providing an overview of the tense-aspect-mood system. This introduction to Rangi grammar acts as a background for the examination of infinitive-auxiliary constructions that are presented in Chapter 3 and provides a context for understanding this typologically marked structure.

2.2 Phonology

This section provides an introduction to Rangi phonology, beginning with the consonants and vowels. An account of the phonemeic inventory is followed by a description of the Rangi tone system and the syllable structure.

2.2.1 Consonants

Rangi has 27 consonants as can be seen on examination of Table 1 below.

Table 1: Phonemic inventory

	labial	**alveolar**	**palato-aleveolar**	**velar**	**glottal**
voiceless stop	p	t		k	
voiced stop	b	d		g	
voiceless affricate			ch		
voiced affricate			j		
voiceless fricative	f	s	sh		h
voiced fricative	v	z			
nasal	m	n	ny	ng’	
voiced pre-nasalised stop	mb	nd			
voiceless pre-nasalised stop	mp	nt		nk	
sonorant	l, r				
glides	w		y		

The orthographic representation used throughout this thesis, where they differ from the symbols of the International Phonetic Alphabet (IPA), are shown in Table 2.

Table 2: IPA equivalents of orthographic representation for consonants

Orthography	**IPA symbol**
ch	[tʃ]
j	[dʒ]
ng	[ŋg]
ny	[ɲ]
sh	[ʃ]
y	[j]

2.2.2 Vowels

Rangi has a seven-vowel system, with a single low vowel and phonemically contrasting front-back pairs at three heights. The vowels are [a], [ɛ], [i], [ɪ], [ɔ], [u] and [ʊ] (Stegen 2002; Dunham 2005). The Rangi vowels can be seen in Table 3 below.

Table 3: The Rangi vowels

i		u
ɪ		ʊ
ɛ		ɔ
	a	

Following Stegen (2011) and the orthography that is being adopted for Rangi literacy, I represent the vowels [ɛ] and [ɔ] as **e** and **o** respectively. The vowels [ɪ] and [ʊ] are represented as **~~ɨ~~** and **~~ʉ~~** respectively, in order to distinguish them from the high vowels [i] and [u], which are represented as **i** and **u**. These representations will be used throughout this thesis.

Rangi has phonemic vowel length alternation, with a distinction found between long and short vowels. This can be seen on comparison of the forms in (5) below (data from Stegen (2002:4)).

(5)	k~~ʉ~~láva	'to sprain'	*versus*	k~~ʉ~~láava	'to wake up early'
	m~~ʉ~~k~~ʉ~~ú~~ʉ~~l~~ʉ~~	'father-in-law'	*versus*	m~~ʉ~~k~~ʉ~~úú~~ʉ~~l~~ʉ~~	'elder brother'

As is widely attested across Bantu languages, Rangi exhibits asymmetric vowel height harmony. This can be observed in instances in which verbal extensions containing the vowels **~~ɨ~~** and **~~ʉ~~** are suffixed to verb stems containing the vowels **e** and **o**. Thus, /ɪ/ is lowered to /e/ after both /e/ and /o/, whilst /u/ is lowered to /o/ only after /o/. The vowel /a/ neither triggers nor undergoes harmony. This can be seen in the verb forms in (6) below, where the applicative suffix -*~~ɨr~~* takes the form -*er* following the mid-vowels /e/ and /o/, but appears as -*~~ɨr~~* after /a, ʊ, u, ɪ, i/.

(6)	gav-ɨr-a	'share out'
	rim-ɨr-a	'loose'
	rɨm-ɨr-a	'farm for'
	chuung-ɨr-a	'tie at/for'
	lʉmb-ɨr-a	'ask for'
	ter-er-a	'listen to'
	bok-er-a	'dig for/at'

Rangi therefore has 'canonical Bantu vowel height harmony'. The properties that canonical Bantu vowel height harmony, as described by Hyman (1999) are that it is subject to morphological conditioning, applies only to suffixes and does not apply to final vowels or prefix vowels. Vowel harmony in Rangi is also subject to this phonological conditioning and exhibits the asymmetry outlined above with only the mid root vowels [e, o] triggering the output of harmony whilst [i, ɪ, u, ʊ, a] do not trigger harmony. The low vowel [a] is opaque, meaning that in addition to not undergoing harmony, it blocks the spread of harmony. Finally, the back initial vowels harmonize only to the back mid vowel [o].[6]

Since Rangi does not readily accept adjacent heterosyllabic vowels, a vowel sequence may be subject to resyllabification, vowel elision, glide formation or coalescence. Sequences of vowels within the word are the result of vowel hiatus across a prefix+root boundary. This occurs at the boundary of nominal and verbal prefixes, vowel-initial stems and tense-aspect-mood morphemes. Prefixes with the vowels ɨ and ʉ either desyllabify on vowel-initial stems, leading to compensatory lengthening of the stem-initial vowel, or they coalesce and assimilate completely. The result of these processes is illustrated in (7) below, which shows pairs of class 3/4 nouns which take the singular prefix *mʉ-* ~ *mw-* and the plural prefix *mɨ-* ~ *mi* ~ *my-* (data from Stegen (2002:10)).[7]

[6] See Hyman (1999) for a detailed study and discussion of the history of vowel harmony in Bantu.
[7] Whilst there is no example of the combination ʉ+ɨ or ɨ+ɨ it is predictable that these combinations will result in wɨɨ and ɨɨ respectively.

(7)	**Class 3**	**Class 4**	
	mw-aáká	my-aáká	'year(s)'
	mw-eérɨ	my-eérɨ	'moon(s), month(s)'
	m~~u-ú~~mb~~u~~	my-~~uú~~mb~~u~~	'calabash(s)'
	m~~u-~~umuu	my-uumu	'fig tree(s)'
	mw-iíwa	mi-íwa	'thorns'

A sequence of the vowels i+a, i+e, i+~~u~~ and i+u results in a glide as can be seen in the forms such as *my-aáka* 'years' and *my-eérɨ* 'moons'. A sequence of two equivalent vowels such as i+i form a long vowel, as can be seen in *miíwa* 'thorns'.

Rangi has ATR harmony in which +ATR vowels trigger leftwards ATR assimilation. This ATR harmony applies both from stems onto prefixes and from suffixes onto stems, and appears to have a lesser effect at a larger distance from the trigger (Stegen 2002:11). Rangi fits the description of a standard seven-vowel system with dominant [+ATR] as described by Casali (1998). Thus, the vowels [i] and [u] spread their [+ATR] features leftwards, resulting in the [+ATR] variants [i, e, o, u] of the underlyingly [-ATR] vowels [ɪ ɛ ɔ ʊ].

2.2.3 Tone

Rangi is a two-tone language exhibiting high and low tones. Throughout this thesis high tone is marked with an acute accent and low tone is unmarked. Short vowels carry only high or low tone. Long vowels, however, can occur with high, low, rising or falling tone. Falling and rising tone is the realization of two different tones on adjacent syllable nuclei. Examples of these tone patterns can be seen on the nouns shown in (8) below (data from Stegen (2002:5)).

(8)	mbava	'cockroach'	(low)
	ibáta	'duck'	(high)
	baanka	'room'	(low)
	mpááha	'fingernail'	(high)
	ibaándi	'grass hopper'	(rising)
	ibáanda	'hut'	(falling)

Lexical tone distinctions appear to have been lost on verbs (Stegen 2002:6). Every verbal stem receives one high tone, which is assigned to the ante-penultimate stem mora and spreads to any preceding stem morae. On stems shorter than three morae,

the earliest possible stem mora receives the high tone. Rangi does however, make use of grammatical tone. The tone on the imperative form, for example, is polar to the tone on the infinitive, as can be seen in (9) below.

(9)	kʉbóka	'to dig'	*versus*	boká	'dig!'
	kʉfyááhɨra	'to sweep'	*versus*	fyaahɨ́rá	'sweep well!'

2.2.4 Syllable structure

The syllable shapes CV (consonant followed by a short vowel) and CVV (consonant is followed by a long vowel) have been reconstructed for Proto-Bantu.[8] The additional structures V and N have also been proposed although it is thought that these syllable shapes may have been limited to prefixes such as the class 1 subject prefix *á-* and the class 9 noun prefix *N- (Hyman 2003a:3). The syllable structures found in Rangi closely mirror those proposed for Proto-Bantu, with CV, CVV, V and CGV (where G stands for glide) forms attested, examples of which can be seen in Table 4 below.

Table 4: Rangi syllable structure

Syllable structure	Example	Translation
V	u-do	'millet'
CV	nd-a	'stomach'
CVV	ipai-pai	'papaya tree'
CGV	mb-w-i	'spider
N	ng-i	'scorpion'

2.3 Nominal morphology

This section provides an overview of the Rangi noun and its modifiers. An introduction to the Rangi noun class system is followed by a discussion of nominal derivation, the associative markers, the possessive construction and possessive pronouns, demonstratives, adjectives, quantifiers, numerals, interrogatives, personal pronouns and the locative suffix.

[8] Although many modern-day Bantu languages have lost the V/VV opposition and the existence of long vowels in Proto-Bantu has been called into question (Meeussen 1979).

2.3.1 Noun classes

Bantu languages are known for employing noun class systems under which noun classes function as grammatical genders, and act, along with an associated agreement system, to cross-reference the arguments of a verb. Bantu noun class systems have long been of interest to linguists, with numerous studies concerned with understanding the underlying semantic basis for the grouping (see, amonst others, Contini-Morava (2002); Maho (1999); Senft (2000b); Demuth (2000)). I assume that the Rangi noun class system has a semantic basis, at least historically, in all instances.

Noun classes are realized morphologically as prefixes on nouns and as agreement markers on syntactic constituents such as adjectives, numerals and verb forms. In certain classes, noun classes indicate not just set membership but also information about grammatical number, with singular and plural nouns classified in different noun classes. Following the system laid out by Bleek (1862) (and extended by Meinhof (1899; 1932)), noun classes are referred to using a numbering system, with classes grouped into singular/plural pairings and numbered accordingly. By convention, singlar noun classes are numbered with odd numbers whilst even numbers represent plural nouns. For example, class 3 is a singular noun class which forms its plural counterpart in class 4.

Rangi nouns typically comprise a nominal prefix and a stem. All nouns are associated with a particular noun class upon which the form of this nominal prefix is dependent. According to the analysis provided by Dunham (2005) and Stegen (2011), Rangi has 17 noun classes. This 17-class analysis is also adopted for the purposes of the current study. The Rangi classes 1–10 exhibit mainly regular singular/plural pairs. The nouns belonging to classes 11–19 exhibit less regular singular/plural pairing and include a number of mass, non-count and locative nouns which exhibit no number distinction and no singular/plural distinctions. There are also nouns which form their plurals in more than one class, such as class 14 nouns,

which have plural counterparts in both class 6 and class 10. Following Stegen (2011), the noun classes which are found in Rangi are shown in Table 5 below.

Table 5: Rangi noun classes

	Prefix	**Allomorphs**	**Examples**
1	m~~u~~-	mw-	*m~~uu~~nt~~u~~* ‘person’, *mwaána* ‘child’
2	va-		*vaant~~u~~* ‘people’, *vaána* ‘children’
3	m~~u~~-	mw-	*m~~u~~t~~i~~* ‘tree’, *m~~u~~v~~i~~r~~i~~* ‘body’, *mweeri* ‘moon’
4	m~~i~~-	my-, mi-	*m~~i~~t~~i~~* ‘trees’, myooda ‘medicines’
5	i-	r-	*iyuundi* ‘farm’, *imaamba* ‘finger’
6	ma-		*makuta* ‘oil’
7	k~~i~~	ch-	*k~~i~~r~~i~~ro* ‘problem’
8	vi-	vy-	*viraasi* ‘potatoes’, *vyak~~u~~rya* ‘food’
9	N-		*nd~~i~~r~~i~~* ‘skin’
10	N-		*ny~~uu~~mba* ‘houses’, *njoya* ‘feathers’
11	l~~u~~-	lw-, lu-	*l~~u~~saanga* ‘sand’
12	ka-		*kachihi* ‘small bird’
14	~~u~~-	w-	*~~u~~ta* ‘bow’, *war~~i~~* ‘porridge’
15	k~~u~~-	kw-, ko-	*k~~u~~rya* ‘eating’
16	ha-		*haant~~u~~* ‘place’
17	k~~u~~-		*k~~uu~~nt~~u~~* ‘place’
19	fi-	fy-	*fyaána* ‘small children’

The use of the alternative prefixes shown in column three of Table 5 is motivated by phonological considerations. For example, if the stem of a class 1 noun begins with a consonant, the prefix is *m~~u~~-* as in *m~~uu~~nt~~u~~* ‘person’. However, if a class 1 noun stem begins with a vowel, the prefix takes the form *mw-* as in *mwaána* ‘child’.

Class 1 and its plural counterpart class 2 contain nouns which denote humans such as *m~~uu~~nt~~u~~* ‘person’, *mwaána* ‘child’ and *m~~u~~dala* ‘old woman’. A number of examples of class 1 and class 2 nouns are shown in (10) below.

(10)	m~~uu~~nt~~u~~	vaant~~u~~	‘person (people)’
	m~~u~~dala	vadala	‘old woman (women)’
	m~~u~~hinja	vahinja	‘girl(s)’
	m~~u~~singa	vasinga	‘child(ren)’
	mwaána	vaána	‘child, son(s)’

Class 1 also contains a closed subset of nouns labeled 1a (the plural counterpart of which is 2a) which denote close kinship terms. The nouns in class 1a and 2a show the same agreement as the nouns in class 1 and 2 but appear without the regular class 1 prefix *m~~u~~-* in the singular. In the plural, they are prefixed by the class 2a prefix *vala-* as can be seen in the examples in (11).

(11)	iyo	valaiyo	'mother(s)'
	taata	valataata	'father(s)'

Class 3 and its plural counterpart class 4 contain nouns which denote a variety of entities, including tree types, natural phenomena and body parts which exhibit part-whole relationships. Examples of class 3 nouns, with their class 4 plural counterparts, can be seen in (12) below.[9]

(12)	m~~u~~t~~i~~	m~~i~~t~~i~~	'tree(s)'
	m~~u~~kono	m~~i~~kono	'hand(s)'
	mweér~~i~~	myeér~~i~~	'moon(s)'
	m~~u~~si	misi	'afternoon(s)'

Class 5 contains nouns which host the prefix *i-* (13) or *ri-* (14). The nouns from class 5 form their plural counterparts in class 6, which hosts the prefix *ma-* regardless of whether their class 5 counterpart is formed using *i-* or *ri-*. Note however, that the plural form of *riiso* 'eye' is *miiso* 'eyes' not **maiso*. This is the result of coalescence which means that /a/+/i/ >/ii/, resulting in the plural form *miiso* 'eyes'.

(13)	imaamba	mamaamba	'finger(s)'
	ivu	mavu	'ash(es)'
	iyuunda	mayuunda	'farm(s)'
(14)	riiso	miiso	'eye(s)'
	raávya	maávya	'caterpillar(s)'

Class 6 also contains a number of mass nouns such as *maaji* 'water', *makuta* 'oil' and *mas~~uu~~su* 'milk', which have no singular form (15).

[9] The plural form *myeeri* 'months' is the result of vowel coalescence with /i/+/e/ > yee.

(15) maaji 'water'
makuta 'oil'
mas~~uu~~su 'milk'

The only human referent found in class 5/6 is *irumbu* ~ *marumbu* 'sister(s)'. As can be seen upon examination of example (16) below, whilst this noun triggers class 5 agreement on the possessive pronoun *raan~~i~~* 'my', it triggers class 1 agreement in both the demonstrative form *~~u~~h~~u~~* and the adjective *m~~u~~duudi* 'small'. This apparent noun class mismatch reflects the centrality of human animacy of the referent for adjectives and demonstratives. This contrasts with the centrality of the noun class for the possessive form.

(16) ~~u~~-h~~u~~ n~~í~~ i-rumbu r-áán~~i~~ m~~u~~-duudi
DEM-1 COP 5-sister 5-my 1-small
'This is my younger sister'

The class 5/6 prefixes *i- ~ri-/ma-* also have an augmentative function. In such instances, the typical noun class prefix is replaced by the class 5 prefix (in the singular) or the class 6 prefix (in the plural) resulting in an augmentative interpretation. For example, *mwaána* 'child' can become *raána* 'big child' or *maána* 'big children' (17).

(17) mwaána raána maána 'big child(ren)'
ndaafu idaafu madaafu 'big billy goat(s)'

Class 7 and its plural counterpart class 8 contain nouns which denote inanimate objects including tools such as *chaarya* 'axe' and other inanimates including *k~~ii~~ntu* 'thing' and *chák~~u~~rya* 'food'.

(18) k~~ii~~nt~~u~~ v~~ii~~ntu 'thing(s)'
k~~i~~chiko v~~i~~chiko 'long rainy season(s)'
chaarya vyaarya 'axe(s)'
chák~~u~~rya vyák~~u~~rya 'food(s)'

As is common in eastern Bantu languages, the prefixes on nouns belonging to classes 9 and 10 consist of an underlying unspecified nasal which assimilates to the place of articulation following plosives. Thus, the prefix takes the form *m-* before a

labial as in *mb~~u~~ri* ‘goat’, and *n-* before a dental as in *ntínyi* ‘ant’. The nasal is realized as *ny-* or *ng’-* when it appears before vowel-initial stems as in *ny~~uu~~mba* ‘house’ and *ng’oombe* ‘cow’. This nasal elides before other consonants, resulting in forms such as *siimba* ‘lion’. There is no difference in morphological form between the singular class 9 nouns and their corresponding plural class 10 counterparts. However, the singular/plural distinction can be seen on the associated modifiers such as demonstrative or possessive pronouns. Examples of class 9/10 nouns can be seen in (19) below.

(19)	nkiingo	‘neck(s)’
	ng’oombe	‘cow(s)’
	nyényeeri	‘star(s)’
	mb~~u~~ri	‘goat(s)’
	s~~u~~v~~i~~	‘leopard(s)’
	~~u~~n~~u~~	‘mosquito(es)’

The class 11 prefix has been reconstructed for Proto-Bantu as containing nouns which are long in shape. Nouns which cover an extensive area, or have extensive reach, are also included in this class such as *l~~uu~~m~~i~~* ‘dew’ and *l~~u~~lvao* ‘lightening’. Nouns in class 11 host the prefix *l~~u~~-* and form their plural, if they have one, in class 10 as can be seen in (20).

(20)	l~~u~~fyo	nj~~u~~fyo	‘knife/knives’
	l~~uu~~ji	nj~~uu~~j~~i~~	‘river(s)’
	l~~u~~víi	mbí~~i~~	‘falcon(s)’
	l~~u~~saanju	saanju	‘pestle(s)’
	l~~uu~~m~~i~~	–	‘dew’
	l~~u~~lavo	–	‘lightning’

The class 12 prefix *ka-* encodes a diminutive meaning and can appear either instead of the original noun class prefix or in addition to the original noun class prefix. Diminutive nouns, the original noun of which belongs to classes 1, 5 and 9 are shown in (21) below. Class 1 nouns lose their class 1 noun prefix. This results in the class 1 noun *mwaana* ‘child’ becoming *kaana* ‘small child’ in the diminutive form. The same is true of the class 5 and class 9 nouns.

(21)	kiivi	<	mwiivi (class 1)	'small thief'
	kahiinja	<	m~~u~~hiinja (class 1)	'small girl'
	kaana	<	mwaana (class 1)	'small child'
	kabaanda	<	ibaanda (class 5)	'small hut'
	kanjoka	<	njoka (class 9)	'small snake'
	kanyenyeeri	<	nyenyeeri (class 9)	'small star'

In other instances, the diminutive prefix occurs alongside the typical noun class prefix. Thus, the class 3 noun *mwiiwi* 'arrow' is *kamwiiwi* 'small arrow' in the diminutive form and the class 15 noun *k~~u~~lu* 'foot' is *kak~~u~~l~~u~~* 'small foot' (22).

(22)	kamwiiwi	<	mwiiwi (class 3)	'small arrow'
	kam~~u~~t~~i~~	<	m~~u~~t~~i~~ (class 3)	'small tree'
	kak~~i~~int~~u~~	<	k~~i~~int~~u~~ (class 8)	'small thing'
	ka~~u~~loongo	<	~~u~~loongo (class 11)	'small lie'
	kak~~u~~l~~u~~	<	k~~u~~l~~u~~ (class 15)	'small feet'

Use of the diminutive form can be seen in example (23) below, where the noun *chihi* 'bird' is prefixed with the diminutive marker *ka-*.

(23) maa a-ka-túúb-a ka-ra ka-chihi [MD.PD-23]
then SM1-CONSC-follow-FV 12-DEM 12-bird
'Then she followed that little bird'

Class 14 contains non-count nouns and abstract nouns which do not have a plural counterpart, such as *war~~i~~* 'stiff porridge' and *~~u~~keva* 'poverty'. A number of count nouns are also found in this class, including *~~u~~ta* 'bow' and *~~u~~r~~i~~r~~i~~nta* 'bed'. The class 14 prefix is *u-* with the allomorph *w-* found before vowel-initial stems (24).

(24)	ur~~i~~mbo	'glue'
	war~~i~~	'stiff porridge'
	wakati	'time'
	~~u~~jusi	'profession'
	~~u~~fumo	'origin'
	~~u~~keva	'poverty'
	wiivi	'theft'

The nouns of class 14 which have plural counterparts form these plurals in either class 6 (25) or class 10 (26).

(25) ~~u~~ta mata ‘bow/bows’

(26) ~~u~~r~~i~~r~~í~~nta nd~~i~~r~~í~~nta ‘bed/beds’

Nouns from other classes can also take the class 14 prefix in the formation of abstract nouns. This can be seen in the examples in (27) below (data from Stegen (2002:24)).

(27)	woosi	‘old age’	cf.	moosi (class 1)	‘elder’
	~~u~~kabaak~~u~~	‘strength’	cf.	nkabaak~~u~~ (class 9)	‘bull’
	~~u~~sáví	‘witchcraft’	cf.	m~~u~~sáv~~í~~ (class 1)	‘witch’
	~~uu~~nt~~u~~	‘humanity’	cf.	m~~uu~~nt~~u~~ (class 1)	‘person’

A subset of these abstract nouns is derived from adjectives and also exhibit the class 14 prefix ~~*u*~~- ~ *w*- as can be seen in the examples in (28) below (data from Stegen (2002:24)).

(28)	~~u~~k~~úú~~l~~u~~	‘bigness, size’	-k~~úú~~l~~u~~	‘big’
	~~u~~dúúdi	‘smallness’	-dúúdi	‘small’
	~~u~~l~~íí~~h~~i~~	‘length’	-l~~íí~~h~~i~~	‘long’
	~~u~~kúfi	‘shortness’	-kúfi	‘short’
	~~u~~ruto	‘weight’	-ruto	‘heavy’
	weer~~u~~	‘whiteness, light’	-eru	‘white, light’
	wiiru	‘blackness, darkness’	-iru	‘black, dark’

Class 15 contains verbal nouns or infinitives. As has been widely noted, Bantu verbal nouns pattern with both verbs and nominal elements. Examples of class 15 infinitives can be seen in (29) below. The only two nouns in class 15 which are not verbal in nature are given in (30) below.

(29)	k~~u~~rya	‘eating’
	k~~u~~tereka	‘cooking’
	k~~u~~loongoa	‘lying’

(30)	k~~u~~-(w)~~u~~l~~u~~	‘leg’
	k~~u~~rumu	‘heaven’

Classes 16 and 17 contain locative nouns. Class 16 contains only the noun *haant~~u~~* ‘place’. Class 17 contains only the nouns *k~~uu~~nt~~u~~* ‘place’ and *k~~u~~mooso* ‘left side’.

(31) Class 16 haant~~u~~ 'place'

(32) Class 17 k~~uu~~nt~~u~~ 'place'
k~~u~~mooso 'left side'

The class 16 noun *haant~~u~~* 'place' can be seen in example (33) below, where it triggers class 16 agreement on both the demonstrative pronoun and the verbal complex in the form of the prefix *ha-*.

(33) ha-ra ha-ant~~u~~ ha-va-~~i~~r-w-áa vi-ryo
16-DEM 16-place SM16-hit-APPL-PASS-HAB 8-millet
'This is the place where the millet is beaten'

The class 16 noun *haant~~u~~* can also be used to describe time, as per example (34) below.[10]

(34) ha-ant~~u~~ ná-som-áá weéwé w-á-bw~~ii~~t-áá
16-place SM1.PAST-read-PAST.HAB 2nd sg.PP SM2nd sg-PAST-play-PAST.HAB
'When I was studying you were playing'

Example (35) shows the class 17 agreement marker *kwa-* triggered on the verb phrase despite the fact that there is no overt class 17 noun.

(35) k~~u~~-ush-a v~~i~~-ryo na lw-aala haaha kwa-look-w-a
INF-mill-FV 8-millet CONN 11-stone now 17-leave-PASS-FV
n~~i~~ mpiindi
COP 9.time
'Grind the millet with the stone now, time is going'

Whilst there is no productive class 18 in Rangi, a vestige of locative class 18 still appears to exist in the terms used to describe a homestead. Equivalent to *chez* in French or *kwetu* in Swahili, *meenyu* and *meetu* are used to describe home as can be seen in example (36).

[10] The use of a locative phrase for temporal purposes is also observed in the Bantu language Swahili where the prefix *-po-* is used both for locative purposes and to refer to the time at which an event took place.

(36) v-oosí v-á m-eetu
2-elders 2-of 18?-our.place
'Our elders'
(lit.: 'elders of our place')

Further evidence that *meeyu* and *meenyu* are related to the class 18 locative class can be seen in example (37) below where the class 18 prefix *mw-* is triggered on the verb *-ikala* 'stay, lie'.

(37) i-taanga r-a m-eenyu jooli mw-ikal-aa
5-area 5-of 18.your(pl).place how 18?-stay-PRES.HAB
'How big is your land?'
(lit.: 'That place of yours, how does it lie?')

Class 19 contains plural diminutive forms and is the plural counterpart of the diminutive class 12. Class 19 nouns are formed by the addition of the prefix *fi-* ~ *fy-*.

(38) fyaana < vaana (class 2) 'small children'
fikuúti < kuúti (class 9) 'small puppies'
fiviryo < viryo (class 8) 'small millet'

The plural diminutive prefix can be seen in use in example (39) below, where the prefix *fi-* is added to the noun *viryo* 'millet'.

[MD.NPD-49]

(39) maa ka-ch~~ɨ~~h~~ɨ~~ maa ka-ka-héé-w-a fi-vi-ryo
then 12-bird then SM12-CONSC-give-PASS-FV 19-8-millet
'Then the little bird was given a tiny amount of millet.'

This sub-section has presented the Rangi noun classes and their prefixes. Section 2.3.2 below examines nominal derivation, looking at verb-to-noun derivation and the derivation of agentive nouns.

2.3.2 Nominal derivation

Verb-to-noun derivational is achieved in Rangi through the addition of the nominalising suffix *-o* and a noun class prefix to a verbal base which carries a high tone. Thus, the noun *mar~~u~~m~~ɨ~~ro* 'roars' in example (40) is comprised of the verb *k~~u~~r~~u~~m~~ɨ~~ra* 'roar (at)', the nominalising suffix *-o* and the class 6 prefix *ma-*. The same can be seen in example (41) where the noun *~~u~~fúmo* 'origin' is derived from the verb *k~~u~~fuma* 'come from'.

(40) ma-rúm-ir-o ya-ri kuli [MD.NPD-77]
6-roar-APPL-NOM SM6-AUX far
'The roars are far away'

(41) u-fúm-o w-óó mw-aasu
14-come.out-NOM 14-of 3-sun
'where the sun comes from'

Further examples of nouns derived from verbs can be seen in (42) below.

(42)	murimo	'work'	-ríma	'farm'
	ifyaahiro	'broom'	-fyááhira	'sweep'
	luseko	'laughter'	-séka	'laugh'
	lusímo	'story'	-síma	'tell a story'
	firiro	'other side'	-fíriira	'jump'

Nouns derived through this process of nominalisation are found in all noun classes except classes 1 and 2. Class 1 and 2 nouns undergo a distinct process for the formation of agentive nouns. This involves the addition of the class 1 prefix *mu-* and the agentive suffix *-i* to a verbal base. Examples of agentive nouns that are derived from verbs are shown in (43) below (data from Stegen (2002:22)).

(43)	mukíindi	'sorcerer'	-kíinda	'bewitch'
	musháani	'blacksmith'	-sháana	'forge'
	musákaati	'hunter'	-sákaata	'hunt'
	mulóoli	'bridegroom'	-lóola	'marry'
	mwiívi	'thief'	-íva	'steal'

2.3.3 Associative markers

Associative markers are used to indicate a possessive relation between two nouns. Rangi differentiates between basic associatives and referential associatives. Whilst the former serves to indicate a basic relationship of possession, the latter refers back to a noun that has been mentioned or suggested earlier on in the discourse. Characteristic of Bantu, the Rangi noun class system exhibits an extensive system of concordial agreement in which all nominal modifiers, pronouns and verb forms show agreement with the head noun in terms of the features of its noun class assignment. This can be seen in the associatives where both the basic form *-a* ~ *-á*

and the referential form *-óó ~ -oo* show obligatory agreement with the noun they are modifying. The form of the associatives for all noun classes is shown in Table 6.[11]

Table 6: Form of the associatives

noun class	simple associative	referential associative
1	wa	woo
2	vá	vóó
3	wá	wóó
4	ya	yóó
5	rá	róó
6	yá	yóó
7	chá	chóó
8	vyá	vyóó
9	ya	yoo
10	já	jóó
11	lwá	lóó
12	ká	kóó
14	wá	wóó
15	kwá	kóó
16	há	hóó
17	kwá	kóó
19	fyá	fyóó

The basic associative *-a~ -á* is used to indicate a simple possessive relation as can be seen in examples (44) and (45) below, where it is used to link a possessor noun with a possessed noun.

(44) mpiindi y-a i-r~~i~~m-a
9.time 9-of 5-farm-FV
'Farming season'

(45) k~~i~~-chik~~u~~ ch-á ~~u~~-h~~u~~ mw-aáká
7-monsoon 7-of DEM-3 3-year
'This year's rainy season, the rainy season this year'

The associative *-óó ~ -oo* is used to refer back to a noun which has been mentioned or indicated in the preceding discourse. The use of the referential associative can be

[11] As can be seen on examination of Table 6 above, both forms of the associative carry a high tone in all classes except for class 1, class 4 and class 9, which carry a low tone. The same tone pattern is found in the possessive pronouns (see section 2.3.4).

seen in examples (46) and (47) below, where it links the possessor noun phrase with the possessed noun phrase in each instance.[12]

(46) m~~u~~-remo w-óó ush-a v-iryo n~~í~~ w-á va-ant~~u~~ va-kí
3-work 3-of grind-FV 8-millet COP 3-of 2-people 2-female
'The work of grinding millet is women's work'

(47) mpiindi y-óó r~~i~~m-~~i~~r-a sware
9.time 9-of farm-APPL-FV 9.weeding.season
'The time of the *sware* weeding season'

Although the presence of distinct forms, encoding basic and referential associates, is rare in Bantu, there are other languages which make use of different strategies to achieve what appears to be a similar goal. Swahili, for example, employs a construction type where a demonstrative is used in addition to the associative. This can be seen in example (48) below.

(48) mw-ezi huo w-a pili
3-month DEM.REF.3 3-of two
'This (the) second month'

2.3.4 Possessive pronouns

There are six forms of the possessive pronoun which correspond to the grammatical persons and number, as can be seen in Table 7 below. The possessive pronouns carry a high tone in all classes except for class 1, class 4 and class 9, which carry a low tone.[13]

Table 7: Possessive pronouns

Person	singular	plural
1	-aan~~i~~ ~ -áán~~i~~	-iitu/-iiswi ~ íítu/-ííswi
2	-aako ~ -ááko	-aanyu ~ -áányu
3	-aachwe -ááchwe	-aavo ~ -áávo

The possessive pronoun appears after the noun it modifies and shows obligatory agreement with the nominal elements, as in examples (49) and (50).

[12] It is also possible that the *-óó* form of the referential associative is the origin of the *-óó* morpheme present in the deictic particles (see section 2.4.3 below).
[13] The same tone pattern was seen for the associative marker in Table 6.

(49) voóvo v-a-húmw-ire k~~u~~-ry-a chá-k~~u~~rya ch-áávo
3rd pl.PP SM2-PAST-finish-PTV INF-eat-FV 7-food 7-their(pl)
'They have already finished eating their food'

(50) n-a-mány-ire i-rina r-ááchwe
SM1st sg-PAST-understand-PTV 5-name 5-his/her
'I know his/her name'

Rangi has two first person plural possessive pronouns; *-iitu* and *-iiswi*. The possessive pronoun *-iit~~u~~* has an exclusive meaning, whilst *-iiswi* has an inclusive meaning. Whilst the exclusive meaning excludes the hearer from the possession, the inclusive meaning is used in contexts where the item or entity is possessed by the hearer as well as the speaker. Inclusive possession can be seen in examples (51) and (52) below, where the entities are possessed by both the speaker and the hearer.

(51) k~~i~~-riro ch-á m~~u~~-ndugu w-íiswi Kondoa
7-death 7-of 1-relative 1-our Kondoa
'The death of our relative in Kondoa'

(52) v-oosí v-á eneo r-íiswi
2-elders 2-of 5.area 5-our
'The elders of our area'

An example of exclusive possession can be seen in (53) below, where the addressee is excluded from the possession.

(53) n~~i~~ní isik~~u~~ na-m~~u~~-kal-~~i~~r-y-e taata w-iit~~u~~
1st sg.PP 9.today SM1st sg-OM1-anger-APPL-cause-FV 1.grandfather 1-our
'Today I angered our (not including you) grandfather'

The inclusive/exclusive distinction in Rangi is also used in a communal sense. Thus, *ngoombe jíit~~u~~* 'our cattle' means the cattle of our family whilst *ngoombe jíiswi* 'our cattle' could be used to refer to the cattle of an entire village. It is also common for the possessive pronoun showing agreement with class 17 to be used to refer to items or entities, indicating that they do not belong to an individual but to a place or a homestead, as in examples (54) and (55) below.

(54) va-singa v-áako ví-ví-iré ma-chuungwa kw-áání
2-children 2-your SM2.PAST1-steal-PERF 6-oranges 17-my
Your children stole my oranges'

(55) nííni n-á-nyw-iré i-rúsu kw-áání
1st sg.PP SM1st sg-PAST1-drink-PERF 5-home.brew 17-my
'I have drunk my homebrew'

2.3.5 Personal pronouns

The forms of the personal pronouns are shown in Table 8 below. Pronominal reference to nouns belonging to classes higher than 1 and 2 employs demonstrative forms (see section 2.3.6).

Table 8: Personal pronouns

Person	singular	plural
1	nííni	suúsu
2	weéwe	nyuúnyu
3	yeéye	voóvo

Since Rangi is a subject pro-drop language, the presence of a personal pronoun is not obligatory. Their presence is often motivated by pragmatic considerations meaning. When personal pronouns do occur, they are associated with a (typically contrastive) focus interpretation. The inclusion of the first person plural personal pronoun in example (56) below therefore results in contrastive focus on the subject nominal *suúsu* 'we'.

(56) suúsu tw-a-húmw-ire ku-ry-a chá-kurya
1st pl.PP SM1st pl-PAST-finish-PTV INF-eat-FV 7-food
'We have already finished eating'

2.3.6 Demonstratives

The Rangi demonstratives exhibit a three-way distinction based on the proximity of the speaker to the referent. The forms of the demonstrative pronouns for all noun classes are shown in Table 9 below. The demonstratives in the first column are used to encode a proximate meaning, the demonstratives in the second column are used to denote entities that have already been referred to in the discourse. The forms in the final column are used to refer to entities that are distant from the speaker.

Table 9: Form of the demonstratives

Noun class	this	that (referential)	that (distant)
1	ʉhʉ	ʉwo	ʉra
2	ava	avo	vara
3	ʉhʉ	ʉwo	ʉra
4	ɨhɨ	ɨyo	ɨra
5	ɨrɨ	ɨro	rɨra
6	aya	ayo	yara
7	ɨkɨ	ɨko	kɨra
8	ivi	ivyo	vira
9	ɨhɨ	ɨyo	ɨra
10	iji	ijo	jira
11	ʉlʉ	ʉlo	lʉra
12	aka	ako	kara
14	ʉhʉ	ʉho	ʉra
15	ʉkʉ	ʉko	kʉra
16	aha	aho	hara
17	kʉnʉ	ʉko	kʉra
19	ifi	ifyo	fira

The demonstratives in the first column are used to encode a proximate meaning. The use of the proximate demonstratives can be in examples (57) and (58).

(57) ɨ-rɨ nɨ́ i-chuumbi
DEM-5 COP 5-chair
'This is a chair'

(58) rek-a ʉ-hʉ salu vya-boh-a dee u-hand-e
put-FV DEM-9 9.sand 8-be.good-FV CONN SM2nd sg-plant-SUBJ
nyanya
10.tomatoes
'Put this sand down well [so you can] plant tomatoes'

The demonstrative pronouns in the second column are used to refer to entities or people which have already been mentioned previously. This can be seen in example (59) below, where the referential demonstrative *ʉwo* 'that' is referring to a person who is known to both the speaker and the hearer or has already been introduced into the discourse.

(59) ʉ-wo mʉ-gonjwa áá-rɨ a-kwíy-ire
1-DEM 1-patient SM1.PAST-AUX SM1.PAST-die-PTV
'That ill person has died'

The demonstratives in the third column are used to refer to entities that are distant from the speaker. This can be seen in example (60).

(60) tol-e rɨra i-paanga
take-FV 5-DEM 5-machette
'Take that machete [over there]!'

Demonstrative pronouns typically precede the noun in Rangi. A number of other Bantu languages spoken in this region of Tanzania, including Chasu (Pare), Mbugu, and Sambaa (Riedel 2009) also have demonstrative pronouns that regularly precede the head noun.[14] Riedel (2009:25) claims that for Sambaa, the positioning of the demonstrative pronoun with respect to the head noun seems to be determined by considerations of focus and deictic versus non-deictic uses. Although she also notes that there is some flexibility in this regard and instances can also be found in which the demonstrative pronoun follows the noun it modifies. The position of the demonstrative after the noun in Rangi appears to relate to considerations of information structure. Thus, the noun *mʉʉntʉ* 'person' in example (61) receives a focus interpretation as a result of appearing before the demonstrative. This contrasts with *mwaáká* 'year' in example (62), which appears after the demonstrative, and which does not receive a focus interpretation.

(61) mʉ-ʉntʉ ʉ-hʉ a-a-boh-a
1-person 1-DEM SM1-PRES-be.good-FV
'This person is good'

(62) mʉ-mero w-a ʉ-hʉ mw-aáká wa-vey-a
3-work 3-of DEM-3 3-year 3-be.bad-FV
'Work this year is bad'

[14] See also Rugemalira (2007) on the Tanzanian languages Ha (J60), Safwa (M20) and Nyambo (J20).

2.3.7 Adjectives

Rangi adjectives show obligatory concord with the nouns they are modifying. Some examples of the adjectives that are found in Rangi are shown in (63) below.

(63) -l~~ii~~h~~i~~ 'tall'
-kufi 'short'
-k~~uu~~l~~u~~ 'big'
-duudi 'small'
-jer~~u~~ 'white'
-jir~~u~~ 'black'
-finyu 'narrow'
-s~~i~~s~~ii~~r~~i~~ 'thin'
-fafu 'hard'

For classes 3 and higher, the adjectival concord is of the same form as the subject prefixes. The same allomorphs are also attested and determined by phonological considerations. The forms of the adjectival concord are shown in Table 10 below.[15]

Table 10: Adjectival agreement

	Prefix	**consonant-initial adjective**	**vowel-initial adjective**
1	m~~u~~-, mw-	m~~u~~k~~úú~~l~~u~~	mwiir~~u~~
2	va-	vak~~úú~~l~~u~~	v~~ii~~r~~u~~
3	m~~u~~-, mw-	m~~u~~k~~úú~~l~~u~~	mwiir~~u~~
4	m~~i~~-	m~~i~~k~~úú~~l~~u~~	miir~~u~~
5	~~i~~-, r-	ik~~úú~~l~~u~~	riir~~u~~
6	ma-	nk~~úú~~l~~u~~, mak~~úú~~l~~u~~	njir~~u~~, miir~~u~~
7	ki, ch-	kik~~úú~~l~~u~~	chiir~~u~~
8	vi-, vy-	vik~~úú~~l~~u~~	viir~~u~~
9	n-	nk~~úú~~l~~u~~	njiir~~u~~
10	n-	nk~~úú~~l~~u~~	njiir~~u~~
11	l~~u~~-, lw-	l~~u~~k~~úú~~l~~u~~	lwiir~~u~~
12	ka-	kak~~úú~~l~~u~~	kiir~~u~~
14	mu-, mw-	muk~~úú~~l~~u~~	mwiir~~u~~
15	k~~u~~-, kw-	k~~u~~k~~úú~~l~~u~~	kwiir~~u~~
16	ha-	hak~~úú~~lu	hiir~~u~~
17	ku-, kw-	kuk~~úú~~l~~u~~	kwiir~~u~~
19	fi-, fy-	fik~~úú~~l~~u~~	fiir~~u~~

[15] Classes 1 and 2 contain the participant forms, encoding first person, second person and third person, with both singular and plural forms manifested. In these forms, the adjectival, subject and object agreement are all distinct. This contrasts to the non-participant classes – classes 3 and above, in which the subject, object and adjectival agreement is of the same form.

When used attributively, adjectives appear after the noun they are modifying as can be seen in example (64). Adjectives can also be used in conjunction with the copula *nɨ́* as in examples (65) and (66), in which case they appear immediately after the copula form.

(64) n-íyó-sáák-a m~~ɨ~~-ti m~~ɨ~~-kufi
SM1st sg-PROG-want-FV 4-trees 4-short
'I want short trees'

(65) m~~u~~-~~u~~ntu ~~u~~-h~~u~~ nɨ́ m~~u~~-k~~úúlu~~
1-person 1-DEM COP 1-big
'This person is big'

(66) i-paanga i-ri nɨ́ ri-fya n-a-wul-á i-ra sik~~u~~
5-machete DEM-5 COP 5-new SM1st sg-PAST-buy-PAST 2 9-DEM 9.day
'This machete is new, I bought it the other day'

Adjectival meanings are also regularly addressed through verbs. This can be seen in the examples below.

(67) yeéye a-kúl-a sana sí á-r~~ɨ~~ kwi-íng-~~ɨ~~r-a
3rd sg.PP SM1.PRES-be.big-FV very NEG SM1-AUX INF-enter-appl-FV
a-ha gari t~~u~~k~~u~~
DEM-16 9.car NEG
'S/he is really big, s/he won't be able to get into the car'

(68) l~~u~~-di lw-áán~~ɨ~~ lo-lé-a sana
11-rope 11-my SM11.PRES-be.long-FV very
'My rope is very long'

(69) m~~u~~-~~u~~nt~~u~~ ~~u~~-h~~u~~ m~~u~~-dúúdi a-bóh-a
1-person 1-DEM 1-small SM1.PRES-be.good-FV
'This small person is good'

2.3.8 Numerals

The Rangi ordinal and cardinal numbers can be seen in Table 11 below.

Table 11: The numerals

	Cardinal numbers	**Ordinal numbers**
1	-ɨmudu/-ɨmwɨ	-a mbere/-a ncholo
2	-vɨrɨ	-a kavɨrɨ
3	-tatʉ	-a katatʉ
4	-nnɨ, -inne	-a káanɨ
5	-sáanʉ	-a sáanʉ
6	músásatʉ	-a músásatʉ
7	mʉfʉngatɨ	-a mʉfʉngate
8	-nááne	-a naane
9	keenda	-a keendaa
10	ikumi	-i ikumi
11	ikúmi nʉ -mwi	-a ikúmi na ʉmwɨ
12	ikúmi na -vɨrɨ	-i ikúmi na vavɨrɨ
20	makúmi yavɨrɨ	-a makúmi ya vɨrɨ
100	mʉryoongo ʉmwɨ/ makumi ikumi	-a mʉryoongo ʉmwɨ/ makumi ikumi

Cardinal numbers follow the nouns they are modifying and show agreement in terms of noun class. This can be seen on examination of examples (70)–(72) below.

(70) i-yoombe r-á i-tofari rɨ-mudu
5-price 5-of 5-brick 5-one
'The price of one brick'

(71) twa-tɨite mbʉri ɨ-tatʉ
1st pl-have 10.goat 10-three
'We have three goats'

(72) va-antʉ va-kí tw-a-vyaal-w-á va-sáanʉ
2-people 2-female SM1st pl-PAST-bear-PASS-PAST2 2-five
'Five girls were born into our family'

Ordinal numbers also typically appear after the noun they are modifying. This can be seen in example (73) below.

(73) mw-aana wancholo
1-child 1-first
'The first child'

The prefix *ka-* is used in the description of the number of times an event has taken place. This can be seen in the examples below where it appears as a prefix on the interrogative *-ngahi* 'how many' (74), and as a prefix on the cardinal number *-tatʉ* (75).[16]

(74) ka-ngahi ú-rɨ dóm-a na Dodoma ʉ-hʉ
NUM-how.many SM2nd sg-AUX go-FV CONN Dodoma 3-DEM
mw-aáká
3-year
'How many times will you go to Dodoma this year?'

(75) u-ra mama a-a-túúb-ɨr-ire kʉ-vyaal-a
1-DEM 1a.mother SM1-PAST-follow-APPL-PTV INF-bear-FV
va-kʉriyamooto ka-tatʉ
2-girls NUM-three
'That mother has given birth to daughters three times [in a row]'

2.3.9 Quantifiers

The quantifier *-oosi* is used to modify nouns to convey the meaning 'all'. It shows obligatory subject concord as can be seen in examples (76) and (77) below.

(76) a-va v-oosi nɨ́ va-jukulu v-iiswɨ
DEM-2 2-all COP 2-grandchildren 2-our
'All of these are our grandchildren'

(77) ng'oombe sí jí-ɨ́i kʉ-nyw-a maaji y-oosi voo tʉkʉ
10.cow NEG 10-AUX INF-drink-FV 6.water 6-all all NEG
'The cow will not drink all of the water'

The invariable quantifier *voo* 'all, completely' is also used to express a meaning similar to 'all'. It typically appears after the noun and can appear either on its own ((78) and (79)), or in conjunction with the quantifier *-oosi*, where it functions as an intensifier (80).[17]

[16] The noun phrase *vakʉriyamooto* is derived from the verb *kʉriya* 'kindle [a fire]' and the noun *mooto* 'fire' hosting the class 2 prefix *va-*. This phrase is used to refer to girls since the work of starting a fire is traditionally the work of young girls.
[17] In this example, the verb form *-somesha* is borrowed from Swahili and is a combination of the verb *-soma* 'read' and the causative suffix *-esh-*.

(78) mʉ-ti ya-hul-ʉk-ire ma-tutu w-a ki-iwi voo
3-tree SM3.PERF-shed-STAT-PERF 6-leaves 3-of 7-summer all
'The tree has lost all of its summer leaves'

(79) ngoombe j-áání voo ní n-giru
10.cattle 10-my all COP 10-black
'All my cattle are black'

(80) dah-a á-rí kʉ-va-some-sh-a v-anna v-oosi voo
able-FV SM1-AUX INF-OM2-read-CAUS-FV 2-children 2-all all
'S/he will be able to educate all of the children'

The modifier *-o-oosi* is used to encode the meaning of 'any'. It can be used in both an affirmative clause (81) or a negative clause (82), and shows obligatory concord with the noun it is modifying.[18]

(81) kʉ-ku-heer-a ndí-rí ki-intʉ chochoosi
INF-OM2nd sg-give-FV SM1st sg-AUX 7-thing 7.any
'I will give you anything'

(82) yeéye sí a-ryúj-aa ma-taanga yoyoosi tʉkʉ
s/he NEG SM1.PRES-eat-PRES.HAB 6-pumpkin 6.any NEG
'S/he does not eat any pumpkins'

The compound construction *-rí foo* is used to express 'many, much'. The auxiliary *-rí* shows obligatory concord with the noun it is modifying and appears after the noun, as can be seen in examples (83) and (84).

(83) vi-bula vi-rí foo
8-frogs 8-AUX lots
'Lots of frogs'

(84) mpíindi j-á ki-ija sí va-kwaat-a samaaki
10.times 10-of 7-dark NEG SM2-catch-FV 10.fish
jí-rí foo tʉkʉ
SM10-AUX lots NEG
'When it is dark they do not catch lots of fish'

[18] The verb *-ryá* 'eat' exhibits the allomorph *-ryúj* when followed by the habitual suffix *-aa*.

2.3.10 The locative suffix

The locative suffix takes the form *-íi* (with the variant *-wii* also attested) and is added to a noun phrase to form locational nouns. The addition of the suffix to a noun is shown in examples (85) and (86) below.[19]

(85) k~~u~~-t~~ii~~te njoka m~~u~~-tíi
17-AUX.have 9.snake 3-tree.LOC
'There is a snake in the tree'

(86) a-samb-~~u~~l-á a-ha kay-íi
SM1PAST-ruin-SEP-PAST DEM-16 house-LOC
'S/he ruined her/his home'

The locative suffix can be used to describe internal location, as in examples (87) and (88) or more general location as in example (89).

(87) yeéye mém-y-a á-r~~i~~ maaji i-durum-íi
2nd sg.PP pour-CAUS-FV SM1-AUX 6.water 5-drum-LOC
'S/he is going to pour water into the drum'

(88) k~~u~~-n~~u~~ ch-umb-íi noó k~~u~~-~~u~~nt~~u~~ tw-a-lál-aa
17-DEM 7-room-LOC COP 17-place SM1st pl-PRES-sleep-PRES.HAB
'There in the room is where we sleep'

(89) ka-tol-e inkwi k~~u~~-ra weer-wíi
CONSC-take-SUBJ 10.firewood 17-DEM outside-LOC
'Go and take the firewood outside!'

The combination of the locative suffix *-íi* and the class 17 prefix *ku-* can be seen in example (90). Whilst the addition of a locative class prefix onto a noun from another noun class is possible in a number of Bantu languages (for example, see Bresnan and Kanerva (1989) for this in Chichewa), this is the only example of this construction attested in my Rangi corpus. It is also possible that this example could be analysed as the result of an elided form comprising the class 17 demonstrative *k~~u~~n~~u~~* followed by the class 9 noun *ny~~uu~~mba* 'house'.

(90) k~~u~~-ny~~uu~~mb-íi k-óó-va-a na i-rutera
17-9.house-LOC 17-PROG-hit-FV CONN 5-heat
'It is hot at home, it is hot inside'

[19] Since the noun *m~~u~~t~~i~~* already ends in the vowel *-~~i~~*, the suffix takes the place of this vowel.

2.3.11 Adverbs

Rangi has derived and non-derived adverbs, both of which are regularly used to modify verbal predicates. Whilst non-derived adverbs, such as *mpol~~ɨ~~* 'later', are not related to any other parts of speech, derived adverbs may be formed from adjectives, nouns or demonstrative pronouns. A list of some common non-derived adverbs is shown in (91) which includes adverbs of time, location and manner.

(91)	chang~~ʊ~~cháang~~ʊ~~	'quickly'
	mpɩ́ɩ́nd~~ɨ~~	'the time (when)'
	f~~ʊʊ~~r~~ʊ~~	'until'
	káari	'still, before'
	ngaá s~~ɨ~~	'without'
	isisi róó	'instead of'
	mpol~~ɨ~~	'later'
	chaaka	'pointlessly'

Adverbs typically appear after the verb phrase, as can be seen in examples (92) and (93) below.

(92)	fyír-a	á-r~~ɨ~~	ny~~ʊʊ~~mba	mpol~~ɨ~~
	sweep-FV	SM1-AUX	9.house	later
	'S/he will sweep later'			

(93)	n-á-dóm-iré	chaaka
	SM1st sg-PAST-go-PAST1	pointless
	'I went pointlessly'	

The most common strategy for the formation of a derived adverb in Rangi is the addition of the class 8 prefix *v-* ~ *vy-* to a verb or an adjective, as can be seen in examples (94) and (95) below.

(94)	rek-a	~~ʊ~~-l~~ʊ~~	sal~~ʊ~~	vya-boh-a!
	put-FV	DEM-11	11.sand	8-be.good-FV
	'Lay this sand down well!'			

(95)	i-bula	r-íyó-nyúúnt-a	vya-le-a
	5-frog	SM5-PROG-jump-FV	8-be.far-FV
	'The frog is jumping high/far'		

2.3.12 Interrogatives

Polar questions are formed using the standard declarative word order accompanied by an interrogative intonation and the question particle ~~úu~~. The question particle ~~úu~~ appears clause-finally as in example (96), and exhibits a dialectal variant *w~~úu~~* as in example (97).

(96) ma-saare y-áányu mwi-ter-iwre ~~úu~~
6-words 6-your SM2nd pl.PAST-listen-PERF.PASS Q
'Were your words listened to?'

(97) n~~í~~ w-ar~~i~~ w-óó-sáák-a úry-a w~~úu~~?
COP 14-stiff.porridge SM2nd sg-PROG-want- FV eat-FV Q
'Is it stiff porridge that you want to eat?'

Bantu languages exhibit a variety of wh-ex situ, partial wh-movement, wh-in situ and the positioning of the wh-phrase immediately after the subject (see, *inter alia*, Schwarz (2004) on Kikuyu; Muriungi (2005) on Kitharaka; Letsholo (2007) on Ikalanga). Rangi exhibits wh-in situ. Content questions in Rangi are formed through the use of interrogative pronouns which are either independent or modifying, as can be seen in Table 12 below where the presence of a hyphen (-) before the interrogative form indicates that it shows agreement with the noun it is modifying.

Table 12: Interrogative pronouns

Form	Translation
ani	'who'
che	'what'
hayi	'where'
jooli	'how'
nadi	'when'
sa che	'why'
-rikwi	'which'
-ngahi	'how many/much'

The interrogative pronoun *ani* 'who' is used to ask about a person. It has a corresponding plural form *valaani* 'who(pl)' which is used to inquire about the identity of more than one person. These forms can appear as subject interrogatives as in example (98), possessive interrogatives as in example (99) and object questions as in example (100).

(98) ani íyó-dóm-a noó rish-a ng'oombe isik~~u~~
who SM1.PROG-go-FV COP herd-FV 10.cattle 9.today
'Who is going to herd the cattle today?'

(99) kalamu ~~i~~-j~~i~~ n~~í~~ j-aá vala-ani
10.pens DEM-10 COP 10-of SM2-who
'Whose pens are these?'

(100) Juma a-mw-óón-á ani?
Juma SM1.PAST-OM1-see-PAST2 who
'Who did Juma see?

Subjects can also be questioned using cleft structures, as can be seen in example (101) below where the copula *n~~í~~* appears before the interrogative *ani* 'who'.

(101) n~~í~~ ani á-r~~i~~ t~~u~~-loong-er-a i-r~~i~~ i-sáare r-ííswi
COP who SM1-AUX OM.1st pl-listen-APPL-FV DEM-5 5-word 5-our
'Who will listen to our words?'

The independent interrogative pronoun *che* 'what' can appear either clause-initially (102) or clause-finally (103).

(102) che w-óó-l~~úú~~s-a ?
what SM2nd sg-PROG-say-FV
'What are you saying?'

(103) ~~u~~-h~~u~~ n~~í~~ m~~u~~-ti che ?
DEM-3 COP 3-tree what
'What type of tree is this?'

A variant of *che* 'what' – *sa che* 'why' – is used in the formation of reason questions (104). The interrogative phrase *sa che* can also be used to form a declarative sentence, where *sa che* is used to introduce a reason or purpose (105).[20]

(104) sa ché w-á-m-báá-iré ?
why SM2nd sg-PAST1-OM1st sg-hit-PAST1
'Why did you hit me?'

[20] In this example, the realisation of *v-* in the verb stem *vaa* 'hit' as *b-* is triggered by the presence of the nasal class 1 object marker *m-*.

(105) n-a-táng-ire sa che m-oosi w-aan~~ɨ~~
SM1stsg-PAST-understand-PTV why 1-old.man 1-my
a-m-baa-iyre isik~~u~~
SM1-OM1stsg-hit-APPL.PERF 9.today
'I know why my husband hit me today'

The interrogative *hayi* 'where' is used to enquire about a location, as can be seen in example (106) below.

(106) hayi w-óó-fúm-a?
where SM2ndsg-PROG-come.from-FV
'Where are you from?'

The interrogative *jool~~ɨ~~* 'how' is used to question the manner or way in which an event or action occurred. It is also used to inquire about the state of someone or something, as can be seen in example (107) below.

(107) i-taanga r-á meenyu jool~~ɨ~~ mwi-kal-aa
5-area 5-of your(pl).place how SM18-stay-PRES.HAB
'How big is your land?, How does your land lie?'

The interrogative *na nadi* 'when' is used to form a question about a time at which and event or action happened or will happen, as can be seen in example (108) below.

(108) na nadi w-óó-k~~úú~~j-a
when SM2ndsg-PROG-come-FV
'When are you coming?'

The interrogative *-rikwi* 'which' is a modifying interrogative pronoun. As a variable interrogative, *-rikwi* shows agreement with the noun it is modifying, as can be seen in examples (109) and (110) below.

(109) vi-raatu vi-rikwi w-áá-r~~ɨ~~ wi-vík-ire ?
8-shoes 8-which SM2ndsg-PAST-AUX SM2ndsg.PAST1-wear-PERF
'Which shoes were you wearing?'

(110) kaya y-aako n~~ɨ~~ i-rikwi ?
9.house 9-your COP 9-which
'Which is your house?'

The interrogative *-ngahi* 'how many/much' is used to form questions about quantity. As a variable interrogative, *-ngahi* shows obligatory concord with the noun phrase it is modifying, as can be seen in (111) below.

(111) meenyu nɨ́ va-ngahi mú-rɨ
your(pl).place COP SM2-how.many SM2nd pl-AUX
'How many of you are there in your family?
(lit.: 'How many are there at your place?')

This section has provided an overview of Rangi nominal morphology, examining the noun classes and the modifying elements including adjectives, cardinal and ordinal numerals, as well as personal, demonstrative and possessive pronouns and interrogatives. Section 2.4 examines Rangi verbal morphology, looking particularly at the structure of the verbal template and the expressions of tense-aspect information.

2.4 Verbal morphology

Bantu languages are well-known for their agglutinative morphology, which is particularly visible in the verbal domain. Rangi, like most other Bantu languages, has a considerable number of inflectional prefixes and derivational suffixes. These include subject and object markers, tense morphemes, negation markers and the reflexive marker.

Tense-aspect-mood distinctions in Bantu are characteristically expressed in specific positions within the verbal form. The simplest way of encoding tense and aspect is through the use of a marker appearing in one of the tense-aspect-mood (TAM) positions. Tense and aspect can also be encoded via tone, or by the addition of auxiliary verbs to the main verb, or through serial verb constructions (Nurse 2003). Some Bantu languages use a combination of information contained within the TAM position and the final vowel, to express tense-aspect distinctions.[21] Whilst tense expresses the time at which an event takes place (e.g. past, present, future), aspect

[21] Tense can also be marked at the pre-subject-marker position, although this is relatively rare across Bantu, whilst marking tense at the post-final-vowel position is rarer still. In some contexts, tones may also distinguish different tenses (Nurse 2008:46).

describes the internal structure of the event (e.g. progressive, perfect, habitual). Mood pertains to the small set of categories that represent the speaker's attitude towards the factuality of an utterance – indicative, subjunctive, imperative etc. In Bantu, indicative and subjunctive forms are both typically marked on the final vowel. Other notions relating to modality such as conditionality, intention, obligation, subordination and permission, may be expressed in the TAM slot or using auxiliaries (Nurse 2008:44).

2.4.1 The Rangi verb

The Rangi verbal system is constructed in the typical Bantu manner in which the verb comprises several elements, not all of which are necessarily present in a given verb form but which always appear in a fixed order (Meeussen 1967; Bearth 2003). This is shown in Table 13 below, which is adapted from Dunham (2004).[22]

Table 13: The structure of the Rangi verb

1	2	3	4	5	6	7
Negative	**Subject prefix**	**TAM**	**Object/reflexive**	**RAD**	**Extension**	**TAM**

The first position in the verb form is that in which the negative prefix *si-* appears. The second position in the verbal complex hosts the subject prefix. The subject prefix (or subject marker) serves to cross-reference the subject of the verb. Subject markers show agreement in terms of noun class or person and number with the subject noun phrase. The third position contains the tense-aspect-mood (TAM) markers. The information contained in the third position, in combination with that in the seventh position, determines the conjugation. The fourth position is where the object and reflexive markers, which are in complementary distribution, are found. The Rangi reflexive marker takes the invariable form *i-*, whilst the object marker shows class agreement with object arguments. The fifth position contains the verb root – indicated by RAD for radical – which contributes the lexico-semantic

[22] This analysis closely follows Meeussen (1967), although under Meeussen's analysis slot 5 and 6 are represented in one position, with no distinction being made between RAD and extension.

meaning of the verb. The sixth position contains valency-modifying verbal extensions, the most common of which in Rangi are the applicative, passive and causative suffixes. The seventh position is occupied by a final vowel. The 'default' form of this final vowel is *-a*. However, in the perfect and recent past verb forms, the slot 7 position is occupied by the suffix *-ire* and *-iré* respectively, whilst in the presence habitual and past habitual it is occupied by *-aa* and *-áa* respectively.

The only two obligatory constituents in a verb form are the root (shown above as RAD) and the final vowel. Minimal forms such as the imperative therefore contain only a radical and a suffix (112). Maximal forms may contain seven elements (113).

(112) dom-a (Dunham 2004:2)
go-IMP2ndsg
'Go!'

(113) si-va-iyo-va-som-er-a ~~tuku~~ (Dunham 2004:2)
NEG-SM2-PROG-2OM-read-APPL-FV NEG
'They are not reading to them'

The elements of the verb are examined in further detail in the subsequent sections of this chapter. An examination of the structure and form of the stem, base and root is followed by a examination of the verbal extensions, verbal inflection and finally an in-depth examination of the conjugations that comprise the Rangi tense-aspect system.

The verbal stem consists of the verbal base (VB), which is the lexical core of the verb, and a final vowel.[23] The verbal base may be suffixed by optional verbal extensions whilst the final vowel, which occupies the slot 7 position, is obligatory. The canonical form of the verbal base in Rangi is Consonant-Vowel-Consonant (CVC). This CVC structure can be seen in the examples shown in (114) below.

[23] When the final suffix is the neutral *-a* it is glossed, following convention, as FV (final vowel).

(114) -dom- 'go'
-heer- 'give'
-jot- 'gather'
-ker- 'cut'
-pat- 'get'
-tem- 'chop'
-rin- 'open'

The root may alternatively have the form Vowel-Consonant (VC) (115) or consonant-glide (CG) (116), although few verbs are of the form CG.

(115) -ush- 'grind'
-it- 'go'
-ul- 'buy'
-~~u~~j- 'come'
-iv- 'steal'

(116) -ry- 'eat'
-chw- 'harvest'

The slots preceding the verbal stem are reserved for prefixes indicating negation, subject agreement and tense-aspect-mood information. Since Rangi is a subject pro-drop language, it is possible for a well-formed phrase to appear without an overt lexical subject. However, the presence of a subject marker on the verb is obligatory except in the infinitive and imperative forms. Subject markers cross-reference the subject argument of a verb. The form of the subject markers for all persons and noun classes is shown in Table 14 below.

Table 14: Subject markers for all persons and noun classes

Person	**Singular**	**Plural**
1st	n-	t- , tw-, t~~u~~-
2nd	~~u~~-, w-	m~~u~~-, mw-
3rd	a-, i-, y-,o-	va-
Class		
3	u-, w-	
4	~~i~~-, y-	
5	r-	
6	ya-	
7	k~~i~~-, ch-	
8	vi-, vy-	
9	~~i~~-, y-	
10	ji-, j-	
11	l~~u~~-, lw-	
12	ka-	
14	~~u~~-, w-	
15	k~~u~~-, kw-	
16	ha-	
17	k~~u~~-, kw-	
19	fi-, fy-	

The Bantu subject marker is a functionally ambiguous inflectional affix that acts as an agreement marker in sentences with full subject NPs but as a morphological pronoun in subject pro-drop sentences (Bresnan and Mchombo 1987). In Rangi, the form of the subject markers is phonologically determined. Thus, class 1 subject agreement has the form *a-* with the variants *i-, y-* and *o-* also attested. A vowel-initial class 7 noun will host the prefix *ch-* whilst a consonant-initial class 7 noun will be prefixed by *k~~i~~-*. Subject agreement on verb forms can be seen in the examples below. In example (117) the first person singular subject agreement takes the form *n-*. In example (118) the class 9 subject *gari* 'car' triggers the class 9 subject agreement *y-* on the verb stem.

(117) n~~i~~ní~~i~~ n-á-nyw-iré i-rú~~su~~ kw-áán~~i~~
1st.sg.PP SM1st.sg-PAST1-drink-PAST1 5-home.brew 17-my
'I have drunk my homebrew'

(118) gari ~~i~~-h~~i~~ ya-ver-~~i~~k-aa ma-junia mia i-mudu
9.car DEM-9 SM9.HAB-carry-STAT-PRES.HAB 6-sacks 9.hundred 9-one
'This car carries one hundred sacks'

Object marking also forms an important part of the Rangi agreement system, with object markers appearing as prefixes immediately adjacent to the verb stem in the verbal template. Object markers show agreement in terms of noun class or person and number and act to cross-reference the object arguments of a verb. Rangi has object markers for all persons and noun classes as shown in Table 15 below. The object markers are morphologically identical to the subject markers for all classes except the participant forms and class 3, as can be seen on comparison of Table 15 below and Table 14 above.

Table 15: Object markers for all persons and noun classes

Person	**Singular**	**Plural**
1st	-n-, -ny-	-t~~u~~- , tw-
2nd	-ku-, kw-	-m~~u~~-, -mw-
3rd	-m~~u~~-, -mw-	-va-
Class		
3	-w-	
4	-i-, -y-	
5	-r~~i~~-	
6	-ya-	
7	-k~~i~~-, -ch-	
8	-vi-, -vy-	
9	-~~i~~-, -y-	
10	-ji-, -j-	
11	-l~~u~~-, -lw-	
12	-ka-	
14	-~~u~~-, -w-	
15	-k~~u~~-, -kw-	
16	-ha-	
17	-k~~u~~-, -kw-	
19	-fi-, -fy-	

Most Bantu languages allow only one object marker to appear in a verb form. There are however, a few languages that do allow multiple object marking. Some languages such as Nyaturu (F30) (Hualde 1989) and Bemba (M40) (Marten et al. 2007), only permit two object markers in restricted environments. In Nyaturu for example, two object markers are permissible in a construction where the first object is first person singular. However, if the first object is from any other class or person,

ungrammaticality results (Woolford 2000:172). In languages which permit more than one object marker, there seems to be no formal restriction on the number of object markers that are permitted (Marten et al. 2007). However, most languages with multiple object marking allow only two or three object markers to co-occur with more complex forms being rare. In addition to restrictions on the number of object markers permissible in a verb form, Bantu languages can be categorized into two groups in relation to restrictions on the co-occurrence of object markers and lexical objects. Languages which allow the co-occurrence of an object marker and a co-indexed local object include Rangi, Swahili and Makhuwa (van der Wal 2009), whilst those which do not allow such a co-occurrence include Haya (Riedel 2009).

Rangi allows a maximum of one object marker in the verb form. The presence of an object marker appears to be determined by pragmatic considerations. Object markers are most commonly used when the object argument is animate, as in examples (119) and (120). The use of an object marker with an inanimate object argument typically functions to encode focus or specificity (121).

(119) a-m~~u~~-vá-ire m~~u~~-ki w-aachwe
SM1.PAST-OM1-hit-PRV 1-wife 1-his/her
'He beat his wife'

(120) n-twal-á kw-íít~~u~~! [MD.NPD-57]
OM1st sg-send-FV 17-our
'Send me [to our] home!'

(121) a-ha ha-ant~~u~~ n-a-ha-r~~í~~m-ire mi-aka i-taat~~u~~
DEM-16 16-place SM1st sg-PAST-OM16-farm-PTV 3-years 3-three
'This area, I have farmed it for three years'

A small number of Rangi verbs appear with the vowel *i-* in the stem-initial position when there is no object marker present, but without it when there is an object marker in the verb form. In forms without an object marker, the absence of *i-* is ungrammatical. The presence of i-initial verbs has been found in a number of Tanzanian languages (Mous 2003), including Sambaa (Riedel 2009:27), and may be

an areal phenomenon. An i-initial verb stem in Rangi can be seen in the form *-ikala* 'stay, live' in example (122) below.

(122) ku-wɨ́r-a ndɨ́-rɨ vyeene ú-rɨ k-ikal-a
OM.2nd sg-tell-FV SM1st sg-AUX how SM2nd sg-AUX INF-live-FV
na ʉ-hʉ
CONN DEM-1
'I will tell you how you will live with this person'

2.4.2 Simple verb forms

Rangi has a rich system of tense-aspect-mood distinctions which are encoded through a combination of a subject prefix, a tense-aspect-mood maker (which may be either a prefix or a suffix) and the associated tone pattern. The negative inflected verb forms also host the negative prefix *si-*. The tense-aspect combinations which are encoded using simple verb forms are shown in Table 16 below, where H indicates a high tone on the verb stem, V indicates a low tone on the verb stem and SM represents the subject marker. These tense-aspect combinations are discussed in order below.

Table 16: Simple verb forms

Tense-aspect	**Form**
Imperative	V-a ~ V-i
Subjunctive	SM-V-e
Present progressive	SM-íyó-H-a
General present	SM-a-H-a
Habitual	SM-a-H-aa
Iterative	SM-ndo-H-a ~ SM-no-H-a
Consecutive	SM-ka-H-a
Recent past	SM-á-H-iré
Perfective	SM-a-H-ire
Recent past progressive	SM-áá-H-a
Recent past habitual	SM-á-V-áá
Distant past	SM-a-V-á

The imperative construction is used for giving orders or instructions and assumes one of two forms in Rangi. The second person singular imperative consists only of the verb root and the final vowel *-a*. Whilst there is no subject marker present in the imperative form, the second person singular interpretation is inherent in the verb form. This can been seen in examples (123) and (124).

(123) unyw-á maaji
drink-FV 6.water
'Drink water!'

(124) rek-á ~~i~~-h~~i~~ sal~~u~~ vya-boh-a!
put-FV DEM-9 11.sand 8-be.good-FV
'Lay this sand down well!'

Rangi also has a second personal plural imperative which comprises of the verb stem and the suffix *-i*. The second person plural imperative can be seen in examples (125) and (126) below.

(125) laang-í n~~ii~~ja ~~u~~-h~~u~~ m~~u~~-~~u~~nt~~u~~!
look-FV well DEM-1 1-person
'Look (you all) at this person carefully!'

(126) songol-í m~~i~~-r~~ii~~nga ~~i~~-h~~i~~!
carve-FV 4-beehive 4-DEM
'Carve (you all) these beehives!'

Subjunctive forms are comprised of a verb stem, a noun class marker and the subjunctive suffix *-e*. This subjunctive suffix *-e* appears to be traceable to the Proto-Bantu subjunctive morpheme *-é* (Nurse 2006:172). Notably, the subjunctive contains no slot 3 TAM marker but obligatorily hosts a subject marker. The subjunctive is most commonly used to express a wish or a desire (127). It is also used when the subject of the dependent clause is different from the subject of the main clause, as in examples (128) and (129).

(127) n-óó-sáák-a v-aana v-aan~~i~~ va-dom-e na shúúle
SM1st sg-PROG-want-FV 2-children 2-my SM2-go-SUBJ CONN 9.school
'I want my children to go to school'

(128) n-óó-sáák-a John i-imb-e
SM1st sg -PROG-want-FV John SM1-sing-SUBJ
'I want John to sing'

(129) mw-aarimu y-óó-sáák-a n-som-e kɨ-taabu
1-teacher SM1-PROG-want-FV SM1st sg-read-SUBJ 7-book
'The teacher wants me to read the book'

With the exception of the imperative and subjunctive forms, the simple verb forms all comprise of an obligatory subject marker, a pre-stem marker, a verbal base and a final vowel. The slot 3 pre-stem marker may encode a specific temporal or aspectual distinction as is the case with the progressive marker -*íyó*-, the consecutive marker *ka*-, the iterative marker *ndo*-, the recent past marker -*á*- or the recent past progressive *áá*-. Alternatively, this position may be filled with the prefix *a*-. As noted by Nurse and Philippson (2006:158) the simple *a*- (which may vary in length and tone) is the most common form displayed by Bantu TAM markers. In many instances this *a*- is a past tense marker. Meeussen (1967:109) reconstructs two separate *a*-markers with past tense reference for Proto-Bantu, whilst Nurse and Philippson (2006:164) suggest a single origin for all past tense *a*- markers across Bantu.

In Rangi, whilst the marker *a*- is commonly associated with a past tense meaning, it also appears as part of the conjugation in the general present tense and the habitual forms.[24] As such, I do not analyse it as making a specific tense-aspect contribution to the clause but rather as an element which is dependent on the information in slot 7 and the tone pattern for the ultimate interpretation of the verb form. The default final vowel is of the form -*a*, as is widely seen across Bantu. When not filled with the default final vowel -*a*, the Rangi slot 7 position may host the perfective suffix -*ire*, the recent past suffix -*iré*, the present habitual suffix -*aa* or the past habitual -*áa*.

[24] In the analysis I provide in Chapter 4, I consider the pre-stem marker *a*- to be a non-future marker since it appears in all tenses except for the future tense.

Events which are coded as present progressive are marked by the prefix *-íyó-* and the presence of a high tone on the verb stem. This can be seen in examples (130) and (131) below.[25]

(130) isik~~u~~ íyó íyó-tóót-y-a i-r~~ú~~s~~u~~
9.today 1a.mother SM1a.PROG-boil-CAUS-FV 5-home.brew
'Today mother is boiling home brew'

(131) i-bula r-íyó-nyúúnt-a vya-l~~ii~~h-a
5-frog SM5-PROG-jump-FV 8-be.far-FV
'The frog is jumping high/far'

The general present is used to describe an action or event which is occurring in the present tense. The general present can be seen in examples (132) and (133) below.

(132) na-térek-a mboha j-á ma-sambi
SM1st sg.PRES-cook-FV 10.vegetables 10-of 6-leaves
'I am cooking leafy green vegetables'

(133) yeéye a-néne-a
3rd sg.PP SM1-be.fat-FV
'S/he is fat'

The habitual expresses the regular or customary repetition of an action or event. In the present habitual form this denotes a current habit and is formed by the presence of the prefix *a-*, a high tone on the verb stem and the suffixation of *-aa* in the slot 7 position. I propose that the Rangi habitual suffix *-aa* has its origins in the Proto-Bantu suffix **-ag(a)* which has been reconstructed as encoding imperfective or habitual aspect (Nurse 2006). The formation of the present habitual can be seen in examples (134) and (135) below.

(134) nkalanga j-éénd-aa l~~u~~-saanga
10.peanuts SM10-go-PRES.HAB 11-sand
'Peanuts go in sandy soil'

[25] The variants *-óó-* and *-éé-* are also used in the Kondoa dialect with no semantic difference between the variants apparent (Stegen 2006).

(135) n-a-súúl-a k~~u~~-ry-a chá-k~~u~~rya na m~~u~~-~~u~~ntu
SM1st sg-PRES-hate-FV INF-eat-FV 7-food CONN 1-person
a-namp-aa maamba j-aachwe
SM1.HAB-lick-PRES.HAB 10.finger 10-his/her
'I hate eating food with someone who licks their fingers'

The iterative is used to express the repetition of an event or state. In Rangi it is most often used to describe a situation in which something is occurring repeatedly at a point at which something else takes place. The iterative is formed through the use of the prefix *ndo-* ~ *no-* which is thought to be derived from *jéenda* 'to go'. The iterative prefix can be seen in examples (136) and (137) below.

(136) va-no-ta-a maaji maa m~~u~~-singa ~~u~~-mw~~i~~
SM2-ITR-collect 6.water then 1-child 1-one
a-ka-wír-a ki-simb-íi
SM1-CONSC-fall-FV 7-well-LOC
'They were getting water and then one child fell into the well'

(137) m~~u~~-singa a-no-ámb-uk-a m~~u~~-ti maa a-ka-wír-a
1-child SM1-ITR-climb-STAT-FV 3-tree then SM1-CSEC-fall-FV
'The child was climbing the tree and then s/he fell'

The consecutive prefix *ka-* is used in recounting series of events where its presence indicates that one event followed the other. The two parts of the sentence are often connected using the preposition *maa* 'then'. The use of the consecutive prefix *ka-* can be seen in examples (138) and (139) below.

(138) ni-ka-jéng-a ny~~uu~~mba (Dunham 2004:3)
SM1st sg-CONSC-build-FV 9.house
'(then) I built a house'

(139) áá-r~~i~~ a-ka-téy-ire na sumu maa
SM1.PAST-AUX SM1-CONSC-trap-PERF CONN 9.poison then
a-ka-dér-a k~~u~~-ry-a k~~i~~-ra chá-k~~u~~rya
SM1-CONSC-fail-FV INF-eat-FV 7-DEM 7-food
'He set [the trap] with poison and then he did not have any food to eat'

There are two degrees of past in Rangi – the recent past and the distant past. The recent past most commonly refers to hodiernal situations or events which took place the day before the utterance. In contrast, the distant past is typically used for events

which took place weeks, months or years ago. However, there is some flexibility about which degree of past is used in which contexts and the time in between these two distinctions can often be encoded by using either tense.[26]

The two degrees of past tenses are used in combination with different aspectual information to form the recent past, the distant past, the recent past progressive and the recent past habitual, all of which are encoded through simplex verb forms. The recent past is formed using the prefix *á-* and the perfect suffix *-ire* as can be seen in examples (140) and (141) below.

(140) n~~iíni~~ n-á-wúr-iré ma-taanga
1st sg.PP SM1st sg-PAST1-buy-PERF 6-pumpkin
'I bought a pumpkin'

(141) v-á-dóm-iré na i-yuundi r~~i~~-ra k~~u~~-ra i-l~~uu~~l-wíi
SM2-PAST1-go-PERF CONN 5-farm 5-DEM 17-DEM 5-valley-LOC
'They went to that farm over there in the valley'

The distant past is constructed using the prefix *a-* and the suffix *-á* in conjunction with a low tone on the verb stem. If the subject marker is the class 1 subject marker *a-*, the two vowels coalese to a single *a-*, as can be seen in examples (142) and (143) below.

(142) a-rum-á k~~u~~-tu-heer-a nkua
SM1-agree-PAST2 INF-OM1st pl-give-FV 10.maize
'S/he agreed to give us maize'

(143) n~~í~~ ~~ú~~-h~~ú~~ mw-aáká a-vyaal-w-á (Stegen 2001:6)
COP DEM-3 3-year SM1-give.birth-PASS-PAST2
'It is this year s/he was born'

The recent past progressive is encoded by the past tense prefix *áá-* and a high tone on the verb stem. This can be seen in example (144).

[26] Recent past is glossed PAST1 whilst distant past is glossed PAST2.

(144) mw-aaná a-áá-k~~u~~l-a (Stegen p.c.)
1-child SM1-PAST1.PROG-be.big-FV
'The child was growing'
(lit.: 'The child was being big')

The recent past habitual is encoded using the prefix *á-* and the habitual suffix *-áa*. This can be seen in example (145) below

(145) ha-ra ha-ant~~u~~ h-á-vir-w-áa vi-ryo
16-DEM 16-place SM16-PAST1-hit-PASS-HAB 8-millet
'The place where millet was beaten'

The present perfect is used to describe an action or event which, at the time of the utterance has already taken place, but continues to have relevance at the time of the utterance. It is formed using the prefix *a-* in conjunction with the perfect suffix *-ire*. This can be seen in examples (146) and (147) below.

(146) a-ha ha-ant~~u~~ n-a-ha-r~~i~~m-ire m~~i~~-aka ~~i~~-tat~~u~~
16-DEM 16-place SM1st sg-PAST-OM16-farm-PTV 4-years 4-three
'I have farmed this area for three years'

(147) m~~u~~-ti y-a-húl-~~u~~k-ire ma-tutu w-á ki-iwi voo
3-tree SM3-PAST-shed-STAT-PTV 6-leaves 3-of 6-summer all
'The tree dropped all of its summer leaves'

The present perfect is also commonly used with verbs which indicate a resulting state, such as *-kikala* 'stay', *-manya* 'understand' and *-kata* 'to tire'. This can be seen in example (148) below.

(148) n~~i~~í~~n~~i n-óó-húm-~~u~~l-~~u~~k-a n-a-kát-ire maát~~u~~k~~u~~
1st sg.PP SM1st sg-PROG-rest-SEP-STAT-FV SM1st sg-PAST-tire-PTV very.much
'I am resting, I am very tired'

2.4.3 Complex verb forms

Other tense-aspect combinations are expressed in Rangi using a complex construction comprising an inflected verb and an auxiliary form. The complex verb

forms, following the analysis adopted by Stegen (2006:6), are given in Table 17 below.[27]

Table 17: Complex verb forms

Tense-aspect	**Form**
Recent past perfective	SM-áá(r~~ɨ~~) SM-a-H-ire
Distant past perfective	SM-ída SM-a-H-ire
Distant past habitual	SM-ída SM-á-V-áa
General future	(k~~u~~)-H-a SM-r~~ɨ~~
Immediate future	(k~~u~~)-H-a SM-íise

The recent past perfective, distant past perfective and distant past habitual are all expressed using complex verb forms comprised of an auxiliary and an inflected verb. The general future tense and the immediate future tense are constructed through the use of an auxiliary and an infinitival verb form. These constructions are presented in order below and are discussed in further detail in Chapter 3.

The recent past perfective is used to describe an action which has been completed in the recent past but which still has an impact at the time of the utterance. The recent past perfective is formed through a complex construction. This complex construction is comprised of the auxiliary *-r~~ɨ~~*, which is inflected for past tense by the prefix *áá-*, and a main verb, which is inflected for subject information and for perfect aspect by the suffix *-ire* on the verb form. This can be seen in examples (149) and (150) below.

(149) ~~u~~-ra m~~u~~-gonjwa áá-r~~ɨ~~ a-a-kwíy-ire
1-DEM 1-ill.person SM1.PAST1-AUX SM1-PAST1-die-PTV
'That ill person has died'

[27] The use of parenthesis indicates that an element is optional. In the Kondoa dialect, the presence of the morpheme *-r~~ɨ~~*, in the recent past perfective form is optional. Similarly, the infinitival prefix *k~~u~~-* is not always present in the future tense. The optionality of these objects is indicated by the parenthesis (…) in the table above.

(150) n-áá-r~~ɨ~~ n-a-m~~u~~-wír-ire k~~u~~-dom-a na
SM1st sg-PAST1-AUX SM1st sg-PAST1-OM1-tell-PTV INF-go-FV CONN
gur-íi
9.market-LOC
'I told him/her to go to the market'

The distant past perfective is used to describe an action which was completed in the distant past but which still has an impact at the time of the utterance. It is encoded using a compound construction which employs the auxiliary *-íja* a main verb hosting the perfect suffix *-ire*. This can be seen in example (151) below.

(151) v-íja v-a-dóm-ire
SM2-AUX SM2-PAST-go-PTV
'They came'

The distant past habitual is used to express an event or action which occurred habitually in the past. It is also formed using the distant past auxiliary *-íja* but the main verb is inflected for habitual aspect by the suffix *-áa*, as can be seen in example (152) below.

(152) Ana a-íja á-súk-áa ndihi
Anna SM1-AUX SM1.PAST2-plait-PAST.HAB 10.rope
'Anna used to plait rope '

The two future tenses are also formed using compound constructions. The general future tense is used to encode an event or action which will occur at some point in the future. It is formed using an infinitival verb form in conjunction with the auxiliary *-r~~ɨ~~*. The general future tense consistently exhibits infinitive-auxiliary order as can be seen in examples (153) and (154) below (the detailed analysis of which will be the topic of Chapter 6).[28]

(153) ki-lwire ~~ɨ~~-k~~ɨ~~ kwa-n-~~ú~~l-a kí-r~~ɨ~~
7-illness DEM-7 INF-OM1st sg-kill-FV SM7-AUX
'This illness will kill me'

[28] As can be seen in example (154), the infinitive in Rangi can also appear without the infinitival prefix *k~~u~~-*. This is discussed in further detail in section 2.5.2.

(154) n~~ɨ~~ínɨ wúl-a ndí-rɨ ɨ-hɨ mundi
1st sg.PP buy-FV SM1st sg-AUX DEM-9 9.sheep
'I will buy this sheep'

The immediate future is used to describe an event or action which is to take place in the near or imminent future. It is also formed using an infinitive in conjunction with an auxiliary. However, the auxiliary used in the immediate future tense is of the form *-íise*. The infinitive consistently proceeds the auxiliary in main clause declarative utterances as can be seen in examples (155) and (156) below.

(155) k~~u~~-nyw-a tw-íise a-ya maaji
INF-drink-FV SM1st pl-AUX DEM-6 6.water
'We will drink this water'

(156) n~~ɨ~~ínɨ dóm-a n-íise na l~~u~~-~~u~~l-wíi
1st sg.PP go-FV SM1st sg-AUX CONN 11-mountain-LOC
'I am going to the mountain'

The use of deictic particles is also commonly associated with the future tenses in Rangi. The particles *tóó-*, *joo* and *koo* are described as 'movement grams' by Stegen (2006) (following Nicolle (2007)). These particles serve to encode verbal deixis, expressing movement in relation to the location of the utterance. Thought to derive from the class 17 locational prefix *k~~u~~-*, the movement gram *koo* is used to denote an action or event taking place at a location that is removed from the place of the utterance (Stegen (2006)). Two possible origins for the movement particle *-tóó-* have been proposed. Whilst Stegen (2006) considered it to be derived from the verb *-ita* 'to go', Dunham (2005) considers it to be derived from the verb *-tola* 'take'. In each of these instances however, its use has been analyzed as 'itive' – denoting movement away from the speaker. The particle *joo* is thought to be derived from the verb *-~~u~~ja* 'come' and has been analysed as 'ventive' – denoting movement towards the hearer.[29] This usage can be seen in the examples below, where the particles *koo* and *tóó* are used to express movement away from the location of the utterance and/or the

[29] Whilst encoding direction within the verbal template seems to be relatively unusual in Bantu languages, it can also be observed in Venda where the itive marker *yo* is attested (Poulos 1990).

speaker ((157) and (158)) whilst the particle *joo* encodes movement towards a location (159).

(157) lam~~u~~tóondo koo fúl-a ndí-r~~i~~ ingo j-ááchwe
9.tomorro DIR wash-FV SM1st sg-AUX 10.clothes 10-his/her
'Tomorrow I will [go to] wash his/her clothes [somewhere else]'

(158) mbula y-óó-vá-a á-vá va-singa sí v-íyó-tóó-r~~i~~m-a t~~u~~k~~u~~
9.rain SM9-PROG-hit-FV DEM-2 2-children NEG SM2-PROG-DIR-farm-FV NEG
'It is raining, those children are not [going somewhere else] to farm'

(159) joo kw-~~i~~-súm-~~u~~l-a ndí-r~~i~~ ~~i~~-h~~i~~ mb~~u~~ri mpol~~i~~
DIR INF-OM9-collect-SEP-FV SM1st sg-AUX DEM-9 9.goat later
'I will come [to where you are] and collect this goat later'

In addition to encoding movement towards, *joo* is regularly used in future tense constructions where it appears to add emphasis to the future timing of an event.

(160) joo k~~u~~-~~u~~j-a ndí-r~~i~~
DIR INF-come-FV SM1st sg-AUX
'I will come (at another time/not now)'

(161) joo dom-a ndí-r~~i~~ na gur-íi mpol~~i~~
DIR go-FV SM1st sg-AUX CONN 9.market-LOC later
'I will go to the market later'

2.4.4 Negation

The encoding of negation in Bantu languages is typically achieved through the use of markers in one (or more) of three morphological slots; the pre-initial, post-initial and post-final positions.[30] A further distinction can be made between bound and unbound negative markers, with bound markers being morphologically part of the verbal constituent whilst unbound negative markers are morphologically independent on the verb form (Güldemann 1999). Unbound elements are particles or clitics, whilst bound elements are affixes. Rangi employs both bound and unbound

[30] These notions of pre-initial, post-initial and post-final are based on the widely used outline of the morpheme slots of the finite verb in Bantu. These were established in Meeussen (1967) and outlined for Rangi in section 2.4.1.

negative markers, with the bound affixes appearing in the pre-initial and post-initial positions.

The most common negation strategy involves a combination of the negative marker *sí*, which appears before the verb, and the negative polarity item *tʉkʉ*, which appears in a clause-final position. This strategy is used to negate the majority of tense-aspect combinations including the present progressive (162), the habitual (163) and the present perfect (164).

(162) sí n-íyó-dóm-a tʉkʉ
NEG SM1st sg-PROG-go-FV NEG
'I am not going'

(163) mʉ-sungaati sí a-lóng-aa na mʉ-keva tʉkʉ
1-rich.person NEG SM1.PRES-spend.day-PRES.HAB CONN 1-poor.person NEG
'A rich person does not spend the day with a poor person'

(164) isikʉ vi-viiswi sí v-ʉ́j-ire tʉkʉ
today 2-fellow.our NEG SM2-come-PTV NEG
'Today our friends did not come'

In order to add emphasis, the word *bweete* 'at all' can also be used alongside the negative marker *si* instead of *tʉkʉ* as in examples (165) and (166).

(165) suúsu sí va-singa v-a shúúle bweete
1st pl.PP NEG 1-children 2-of 9.school at.all
'We are not school children'

(166) ma-wiye a-ya sí ya-fa-aa kʉ-jeng-er-a sakafu bweete
6-stones DEM-6 NEG SM6.PRES-suit-PRES.HAB INF-build-APPL-FV 9.floor at.all
'These stones are not at all suitable for building a floor'

The general future tense is also negated by the negative marker *si* and the negative polarity item *tukʉ* as can be seen in example (167) below.[31]

(167) nɨíni sí ndí-rɨ dóm-a na Kondoa tukʉ
1st sg.PP NEG SM1st sg-AUX go-FV CONN Kondoa NEG
'I will not go to Kondoa'

In contrast to the general future, the immediate future cannot be negated by the addition of *sí* and *tukʉ*, as is evidenced by the ungrammaticality of examples (168) and (169).

(168) *sí dom-á w-íise tukʉ
NEG go-FV SM2nd sg-AUX NEG
'You will not go'

(169) *si n-íise térek-a tukʉ
NEG SM1st sg-AUX cook-FV NEG
'I will not cook'

It appears that whilst in the affirmative forms there is a distinction between the immediate future and the general future, there is only one future tense negative counterpart – this is of the form sí SM-rɨ V-á. The absence of a negative immediate future tense is not usual within Bantu languages, where there are a number of instances in which not every affirmative tense-aspect-mood form has a corresponding negative form. In Swahili for example, the future tense can be negated using the standard strategy ((170) and (171)). The past tense formed by *-li-* however (172), has a corresponding negative formed with the prefix *ku-* (173) and the addition of *-li-* results in ungrammaticality (174).

(170) kesho tu-ta-end-a shamba-ni [Swahili]
9.tomorrow SM1st pl-FUT-go-FV 5.farm-LOC
'Tomorrow we will go to the farm'

(171) kesho ha-tu-ta-enda shamba-ni [Swahili]
9.tomorrow NEG-SM1st pl-FUT-go-FV 5.farm-loc
'Tomorrow we will not go to the farm'

[31] The ordering of the auxiliary with regards to the infinitival verb form is discussed in further detail in Chapter 3.

(172) jana tu-li-end-a shamba-ni [Swahili]
9.yesterday SM1st pl-PAST-go-FV 5.farm-LOC
'Yesterday we went to the farm'

(173) hatu-kw-end-a shamba-ni [Swahili]
NEG.SM1st pl-PAST.NEG-go-FV 5-farm-LOC
'We did not go to the farm'

(174) *jana ha-tu-li-end-a shamba-ni [Swahili]
9.yesterday NEG-SM1st pl-PAST-go-FV 5.farm-LOC
'Yesterday we did not go to the farm'

In Rangi there is only one context in which a negative marker appears in the post-initial position. This is restricted to constructions involving -*sina* 'not be, not have' as can be seen in examples (175)–(177).

(175) twa-sina mpeesa baa chá-k~~u~~rya
SM1st pl-NEG.have 9.money nor 7-food
'We do not have money or food'

(176) mpichi ~~i~~-sina m~~u~~-ryoongo t~~u~~k~~u~~ [MD.H&H.PS-21]
9.hyena SM9.NEG.have 3-brain NEG
'The hyena has no brains'

(177) k~~u~~-sina ma-yi t~~u~~k~~u~~
17-NEG.have 6-egg NEG
'There are no eggs'

Cross-Bantu, there is evidence that post-initial negative elements have their origins in earlier inflected auxiliaries. Part of the support for this comes from the observed verbal properties which are often exhibited by these elements (see Güldemann (1999) for evidence of this in Northern and Standard Swahili). It appears that the distinction between 'to be' and 'to have', which is often encoded in Bantu through the presence and absence of the conjunction *na* 'and, with', has been lost in Rangi in this instance. However, the copula function of *sí* in Rangi provides further support for an analysis of -*sina* being historically comprised of the negative copula *sí* and the conjunction *na* 'and, with' (or alternatively from a lost auxiliary form meaning 'to be').

The third negative strategy is found only in the negative imperative – or prohibitive – construction where the negative marker *tʉkʉ* is used in conjunction with the standard imperative construction. This can be seen in example (178).

(178) kʉ-n-va-a na nkome tʉkʉ! [MD.H&H.PS-16]
INF-OM1st sg-hit-FV CONN 9.stick NEG
'Do not hit me with a stick!'

2.4.5 Verbal derivation

There are a number of processes of verbal derivation operative in Rangi. The addition of the suffix *-ha* in the verbal extension slot (position 6) is used to derive verbs from nouns and adjectives.[32] Examples of these verb forms can be seen in (179) below (data from Stegen (2002:138)).

(179) -néneha	'become fat'	-néne	'fat'
-rútaha	'become heavy'	-ruto	'heavy'
-lóngoha	'tell a lie'	ʉlóóngó	'lie'
-lʉʉha	'be long'	-lííhʉ	'long'

Verb-to-verb derivation also occurs through the addition of verbal extensions after the verb stem and before the final vowel. Bantu languages typically have a rich array of verbal derivative morphemes which may be suffixed to the verb stem. Hyman (2003b) and Good (2005) note that the majority of Bantu languages exhibit this suffix system. These suffixes are traditionally referred to as verbal extensions and function to modify the syntactic frame associated with a verb. They may increase the valency of the predicate, as is the case with the causative, benefactive, instrumental and locative extensions, or decrease the valency of the predicate, as with passive, reciprocal and stative extensions. Other extensions act to reorient the action such as the reversive or directional whilst others encode aspect such as the resultative, inchoative or pluractional extensions. The most common verbal extensions in Rangi are the applicative, causative, passive, separative and stative extensions. These are discussed in order below.

[32] According to Stegen (2000), the final *-a* of the suffix *-ha* occupies the final vowel slot of the verbal template.

The characteristic use of the Bantu applicative, according to Peterson (1999:120), is to make 'intransitive verbs transitive and transitive verbs "supertransitive" in that they have two direct objects'. Significantly, the addition of the applicative suffix makes intransitive verbs transitive by allowing them to take an object argument, rather than by adding a subject argument (as is seen for causativisation). The applicative extension in Rangi is a valency-increasing extension which has the basic function of introducing an additional object argument to a proposition. Across Bantu the applicative suffix has been reconstructed as *-*id*- and typically appears as -*il*- or -*ir*- (Good 2005:6). In Rangi the applicative extension is -*ɨr*- ~ -*er*- with the suffix vowel determined by the height of the stem vowel. As a result of asymmetric vowel harmony, the suffix appears as -*ɨr*- after verbs containing the vowels *i, ɨ, a, u,* and *ʉ* whilst it appear as -*er*- following verbs containing the vowels *e* and *o*. Examples of the applicative verbal extension can be seen in (180) below.

(180)	-rɨma	'farm'	-rɨmɨra	'weed'
	-téra	'hear'	-térera	'listen to'
	-kenda	'go'	-kéndera	'continue, go towards'
	-bóka	'dig'	-bókera	'dig for/at'
	-chúunga	'tie'	-chúungɨra	'tie at/for'
	-fʉla	'wash (clothes)'	-furɨra	'wash (clothes) at/for'
	-kímbira	'run'	-kímbírira	'run towards'

Whilst objects introduced by the applicative can assume a variety of semantic roles, the applicativised object in Rangi most commonly appears as the benefactive (181). In example (182) the object marker on the infinitive refers to a benefactive object argument whilst the lexical object, which follows the auxiliary *chákʉrya* 'food', is a theme.

(181)	n-óó-mʉ́-bók-er-a	mʉ-kaaya	w-aanɨ	vi-ráasi
	SM1-PROG-OM1-dig-APPL-FV	1-neighbour	1-my	8-potatoes
	'I am digging potatoes for my neighbour'			

(182)	kwa-n-térek-er-a	v-íise	chá-kʉrya
	INF-OM1st sg-cook-APPL-FV	SM2-AUX	7-food
	'They will cook food for me'		

The applicative suffix can also appear twice in a verb form, resulting in a double applicative construction. In such instances it may be associated with an intensive function as in the example in (183) below.

(183) k~~u~~-dumb-~~i~~r-~~i~~r-a m~~u~~-~~u~~nt~~u~~ maát~~u~~k~~u~~ n~~í~~ k~~u~~-m~~u~~-samb-~~u~~l-a
INF-admire-APPL-APPL-FV 1-person a lot COP INF-OM1-ruin-SEP-FV
'To admire someone too much is to ruin them'

The causative extension functions to add a 'causer' subject argument to the verb. The 'causer' assumes the semantic role of allowing or forcing the original subject (which may be coded as the object of the causative verb or may be omitted) to carry out the action described by the verb.[33] The causative extension in Rangi has the form -*y*-.[34] Examples of causative verb forms are shown in (184) (data from Stegen (2002:14)).

(184) -ófa	'fear'	-ófya	'frighten'
-líiha	'be long'	-líihya	'lengthen'
-méma	'be full'	-mémya	'fill'
-taanga	'understand'	-taangya	'explain'
-toota	'boil'	-tootya	'make boil'

The use of the causative extension can be seen in examples (185) and (186) below.

(185) ser-~~u~~k-y-a maaji y-óó nw-a!
boil-STAT-CAUS-FV 6.water 6-of drink-FV
'Boil water to drink today!'

(186) nijó a-vá-ire ng'oombe y-aachwe maa
9.yesterday SM1.PAST-hit-PERF 9.cow 9-his/her then
ya-ka-ta-y-a
SM9-CONSC-miscarry-CAUS-FV
'Yesterday he hit his cow and then she miscarried'

[33] In some languages the causative extension also functions to promote an instrument to object status or to introduce an instrument. This function of the causative extension is similar to the way in which the applicative is used more widely across Bantu (see Kimenyi (1980) for this in Kinyarwanda).
[34] The form -*isy*- is also observed in -*ríisya* 'feed' from -*ryá* 'to eat', although this appears to be the only instantiation of the suffix taking this form.

The use of the causative suffix in perfect verb forms yields the form *-irye* as a result of infixation. This can be seen in examples (187) and (188).

(187) taáta a-lɨ́ɨ́h-irye lʉ-dihi (Stegen 2007:7)
1.father SM1-long-CAUS.PERF 11-rope
'father lengthened the rope'

(188) nɨ́ɨ́nɨ isikʉ na-mʉ-kal-irye taata w-iitu
1st sg.PP 9.today SM1st sg.PAST-OM1-be.angry-CAUS.PERF 1a.father 1-our
'Today I angered our father'

Other verb forms appear to have undergone a semantic shift following the addition of the causative suffix or are no longer connected to a form used synchronically. Examples of these are shown in (189) below.

(189) -láhya	'show'	<?	-láha	'to promise'
-bóoya	'do/think'	<?	-bóoha	'to be good'
-kéehya	'reduce'	<?	-kéeha	'to breathe'

A causative meaning is also expressed using the verbal extension *-ɨk.* Whilst *-ɨk* is most commonly associated with the stative in Rangi, it is possible that the causative use of *-ɨk* is traceable to the Proto-Bantu reconstruction of the causative extension which has the form *-*ic-i-* (Meeussen 1967; Schadeberg 2003b). Examples of these verbs are shown in (190) below.

(190) -láárɨka	'invite'	-láala	'lie down'
-árɨka	'circumcise'	-ála	'spread'
-véreka	'carry on back'	–	

The passive verbal extension takes the form of the suffix *-w-* and can be applied to all transitive verbs. The form *-iw-* is also attested in the verb *-riiwa* 'be eaten'. The passive functions to demote the agent of a transitive phrase. In instances in which the demoted agent is still present in the clause it is introduced by the copula *nɨ́*, as can be seen in examples (191) and (192) below.

(191) mʉ-laangi nɨ́ mw-ooha w-oo lʉm-w-a nɨ́ njʉki
1-Rangi COP 1-coward 1-of bite-PASS-FV COP 10.bees
'A Rangi person is a coward and fears being stung by bees'

(192) n-á-sít-iré k~~u~~-lool-w-a n~~í~~ m~~u~~-keva
SM1st sg-PAST1-refuse-PAST1 INF-marry-PASS-FV CONN 1-poor.person
'I refused to be married to a poor person'

The agent can also be omitted entirely as in example (193). As a result of infixation, the passive suffix takes the form *-irwe* in the perfect tense.

(193) nijó ny~~uu~~mbá y-a-táás-irwe (Stegen 2002:13)
9.yesterday 9.house SM9-PAST1-plaster-PERF.PASS
'Yesterday the house was plastered'

(194) inkwi ~~i~~-j~~i~~ ja-tem-irwe n~~í~~ á-vá
10.firewood 10-DEM SM10.PAST-cut-PERF.PASS COP DEM-2
va-temainkwi
2-lumberjacks
'This firewood was cut by those lumberjacks'

The stative verbal extension takes the form *-~~i~~k* (with the allomorphs *-uk* and *-ok*) and is traceable to the Proto-Bantu reconstruction *-*ik*- (Meeussen 1967; Schadeberg 2003a). In its canonical use, the *-*ik* suffix is applied to transitive change-of-state verbs such as 'break'. This formpart of a process in which the agent of the base verb is suppressed and the object assumes the role of logical subject, resulting in a stative interpretation. I adopt the term 'stative' following Mchombo (1993a), to refer to the context in which the subject is potentially or factually affected by the action expressed by the verb. The use of the stative in Rangi can be seen in examples (195) and (196) below.

(195) a-chim-~~i~~k-iyre nijo i-tanuuro r-ááchwe
SM1.PERF-burn-STAT-CAUS.PERF 9.yesterday 5-kiln 5-his/her
'Yesterday he burnt his kiln'

(196) mw-eend-a k~~u~~-n-k~~u~~mb~~u~~s-~~i~~k-a Misiru [MD.NPD-127]
SM2nd pl-want-FV INF-OM1st sg-remind-STAT-FV Misiru
'[Why do you want to] go and remind me of Misiru?'

The seprative suffix *-ol-* ~ *-~~u~~l-* is also found in Rangi. This morpheme does not appear to be productive and the connection to the basic verb form appears to be lost in most cases. The separative extension can be seen in the verb forms in (197) below.

(197)	-chúúng~~u~~la	'untie'	-chúunga	'tie'
	-súm~~u~~la	'collect'	–	
	-sámb~~u~~la	'ruin, destroy'	–	
	-hál~~u~~la	'peel, strip off'	–	

In Rangi, the reciprocal function of the Proto-Bantu suffix *-*an*- has been assumed by the reflexive marker *i*- which occupies the slot 4 position in the verbal template. A reflexive marker typically denotes a referent that is identical to that of the subject noun phrase, indicating that the agent and the patient (or analogous semantic roles) are the same entity (e.g. *A washed himself*). A reciprocal construction on the other hand, refer to situations in which there are two participants but in which the relation in which A stands to B is the same as that in which B stands to A (e.g. *A and B hit each other)* (Heine 1999; Schladt 2000). Examples of the reflexive function of the prefix *í*- can be seen in the verb forms in (198) whilst the reciprocal function of *í*- can be seen in the verb forms in (199) (data from Stegen (2002:139)).

(198)	-itéera	'feel'	-téera	'hear'
	-ívísa	'hide oneself'	-vísa	'hide'
	-ísúka	'plait one's own hair'	-súka	'plait hair'
(199)	-ílóola	'marry each other'	-lóola	'marry'
	-íréka	'leave each other'	-réka	'leave'
	-íváa	'fight, hit each other'	-váa	'hit'

Despite the fact that both the reciprocal and the reflexive functions have been subsumed under the reflexive marker *i*-, some forms with the -*an*- suffix have survived. However, these forms are non-productive and establishing the corresponding basic form of the verb is difficult in some instances. The reciprocal marker *-*an*-/-*na* is widely found in Bantu languages and its origins have been traced back to the comitative preposition **na* 'with' (Schladt 1996). Examples of verb stems containing the reciprocal suffix -*an* are shown in (200) (data from Stegen (2002:143).

(200)	-l~~u~~mana	'meet'	-l~~u~~ma	'bite'
	-sháana	'meet'	-cha	'grind'
	-ífyáana	'resemble'	–	

Finally, three less frequently used and non-productive verbal extensions found in Rangi are the active-positional suffix *-al*, the passive-positional suffix *-ma* and the contactive suffix *-at*.[35] The active-positional *-al* can be seen in the verb forms in (201) below (data from Stegen (2002:143)).

(201)	-fálala	'fly'	-fála	'go up (moon)'
	-íkala	'sit'	-íka	'go down, flow'
	-lwáala	'fall ill'	-láʉla	'cure'
	-láala	'lie down'	–	
	-váala	'carry on shoulder'	–	
	-cháala	'remain'	–	

The passive positional suffix *-ma* is likely to be traceable to the Proto-Bantu positional suffix *-*am* and can be seen in the verb forms shown in (202) (data from Stegen (2002:143)).

(202)	-ínama	'incline'
	-tʉ́mama	'work'
	-ásama	'open mouth'
	-chwáama	'kneel'
	-sáama	'move (house)'

The examples in (203) below show the contactive suffix *-at* which is also traceable to the Proto-Bantu 'tentative' or contactive suffix *-*at* (data from Stegen (2002:143).

(203)	-kwáata	'seize, hold'
	-lwáata	'tread on'
	-fyáata	'hold'
	-fináata	'rub, massage'
	-ábábáata	'stroke'

Unlike the other slots in the Bantu verbal template, the extension slot can be occupied by more than one marker.[36] In most languages however, there appears to

[35] These three extensions, along with the non-productive suffix *-an* were also observed in Nyamwezi (F20) (Maganga and Schadeberg 1992). Nyamwezi is a Bantu language spoken also in Central Tanzania.

[36] Notably, these extensions can occur in long succession as exemplified by Ngunga (2000) for Ciyao, in which terms such as *taam-uk-ul-igw-aasy-an-il-a* 'cause each other to be unseated for' are possible.

be a restriction on the order in which these morphemes can combine, although some languages do allow greater freedom in the order of the application of suffixes, sometimes with corresponding semantic differences. The observed restrictions on the order in which verbal extensions can attach to the verb stem have given rise to theories based on a close relationship between Bantu verbal morphology and syntax. Notably these include Baker's (1988) Mirror Principle, which claims that the morphemes that have a narrower scope over the semantics of a verb will appear closer to the verbal root than morphemes that have a wider semantic scope. Other theories repute this claim however, arguing that syntax is not a determining factor in the ordering of the suffixes. Some claim that the ordering of the suffixes is morphologically determined, independent of their semantic scope (Bresnan and Moshi 1990; Hyman and Mchombo 1992; Alsina and Mchombo 1993; Alsina 1999; Hyman 2003b). A number of other analyses are based solely on semantics (Bybee 1985 cited in Hyman (2003b:1)). Whilst others posit a combination of these factors (Hyman 2003b).

The order in which the verbal extensions appear in Rangi is shown in (204) below. A number of verb forms hosting multiple verbal extension suffixes can be seen in (205).

(204) separative – applicative – causative – passive

(205)	-h~~ú~~m-~~ú~~l-uk-a	'rest'	(separative+stative)
	-lóól-w-a	'be married'	(separative+passive)
	-kál-uk-w-a	'be thirsty'	(stative+passive)
	-r~~í~~m-~~i~~r-y-a	'forget'	(applicative+causative)

Example (206) shows the presence of both the separative and causative suffixes, whilst example (207) contains the stative and the applicative suffixes. In both instances they appear in the order outlined in (204) above.

[MD.NPD-67]

(206)	a-va-kilong-ol-y-a	na	m~~u~~-l~~u~~me	w-aachwe
	SM1-OM2.PAST-lead-SEP-CAUS-FV	CONN	1-husband	1-her/his
	'She lead the way with her husband'			

(207) mw-eene k~~u~~-sina r~~i~~-~~i~~ng~~i~~ r-óó m~~u~~-l~~uu~~s-~~i~~k-~~i~~r-a t~~u~~k~~u~~
SM1-REL 17-NEG.HAVE 5-other 5-of OM1-say-STAT-APPL-FV NEG
'[The person] about whom there is nothing more to say'

2.5 Syntactic considerations

2.5.1 Prepositions and conjunctions

Conjunction in Rangi is most commonly achieved through the use of the preposition *na* 'and, with, to'. The main prepositions are *maa* 'then', *ba* 'even' and *sa* 'in order to'. The preposition *na* 'and, with, from' performs a number of functions. Its main function is as a conjunction, where it serves to join two noun phrases or two verb phrases. This can be seen in examples (208) and (209) below.

(208) tól-a nd~~i~~-r~~i~~ i-sire maa ndi-r~~i~~m-e na nyúunyu
take-FV SM1st sg-AUX 5-hoe then EMPH-farm-SUBJ CONN 2nd pl.PP
'I will take the hoe then I will farm with you (pl)'

(209) m~~u~~-temi na m~~u~~-keva si-v-iloond-aa t~~u~~k~~u~~
1-rich.person CONN 1-poor.person NEG-OM2-follow-PRES.HAB NEG
'A rich person and a poor person do not follow each other'

A contracted form of *na* is also used alongside personal pronouns as can be seen in example (210), where *na* appears in a contracted form alongside the third person singular pronoun *yeéye*. This results in the form *nee* 'with him/her'.

(210) tw-a-l~~u~~m-an-á n-ee njir-íi baa kwa-taan-a
SM1st pl-PAST-meet-REC-PAST2 CONN-3rd sg 9.way-LOC CONN INF-know-FV
'We met him/her on the road without knowing'

In its prepositional use, *na* is used to indicate direction towards a location, as in examples (211) and (212).

(211) isik~~u~~ a-dóm-ire na gur-íi
9.today SM1-go-PERF CONN 9.market-LOC
'Today s/he has gone to to the market'

(212) sees-a na a-ha ni-ku-w~~i~~r-e
approach-FV CONN DEM-16 SM1st sg-OM.2nd sg-tell-SUBJ
'Come closer so I can tell you [something]!'

The use of the *na* in conjunction with the preposition *keende* 'since' can be seen in example (213).

(213) a-vér-~~ɨ~~k-ire m~~u~~-singa w-aachwe keende na
SM1.PAST-carry-STAT-PTV 1-child 1-her since CONN
chuuri
9.mid-morning
'S/he has been carrying her/his child since mid-morning'

The preposition *na* is also used to introduce an instrument adjunct as can be seen in example (214). Its use in expressing manner can be seen in example (215).

(214) nyama kér-w-a i-r~~i~~ na l~~u~~-fyo
9.meat cut-PASS-FV SM9-AUX CONN 11-knife
'The meat will be cut with a knife'

(215) yeéye a-néne-a sí á-r~~i~~ dáh-a jeend-a mpaka
3rd sg.PP SM1-be.fat-FV NEG SM1-AUX able-FV go-FV until
Kondoa na ma-~~ulu~~
Kondoa CONN 6-legs
'S/he is fat, s/he will not be able to go to Kondoa by foot'

The conjunction *sa* is used to encode a meaning of 'in order to, with the reason of'. Its use can be seen in examples (216) and (217) below, where it connects a noun with a verbal predicate in each instance, expressing a reason or purpose.

(216) maaji sa t~~u~~-jeng-er-e [MDQ.PG –S37]
6.water for SM1st pl-build-APPL-SUBJ
'Water for us to build'

(217) k~~u~~-taang-a va-ndugu v-ááko vya-boh-a sa lam~~u~~tóondo
INF-know-FV 2-relatives 2-your 8-be.good-FV for 9.tomorrow
'It's good to know your relatives for the sake of tomorrow'

The conjunction *maa* is frequently used with the consecutive marker *-ka-*, and can be translated as '(and) then' (218) or 'but'(219) .

[MDQ.PG-S44]
(218) maa tu-ka-it-a i-rongo noo kw-iit-a i-salu
then SM1st pl-CONSC-pour-FV 5-mud REL INF-pour-FV 5-sand
'(and) then we pour on mud and [we pour on] sand'

(219) maa keyi n-óó-jénga-jéng-a [MDQ.PG-S11]
but also SM1st SG-PROG-build-build-FV
'But I also do odd jobs'

The conjunction *baa* 'even, nor' also functions as a coordinating conjunction where it is used to present a non-contrasting negative option (similar to 'nor'), as in example (220) or for emphasis (similar to 'even'), as in example (221).

(220) twa-sina mpeesa baa chá-k~~u~~rya
1st pl-NEG.HAVE 9.money nor 7-food
'We do not have money nor food'

(221) á-r~~i~~ na vi-jombulo vi-k~~uu~~l~~u~~ vy-á bwet-a baa mpira
SM1-COP CONN 8-calves 8-big 8-of play-FV even 9.ball
'S/he has big calf muscles s/he would even be able to play football'

2.5.2 The infinitive

The Bantu infinitive has long been observed to exhibit both verbal and nominal properties (Meinhof and van Warmelo 1932; Doke 1955; Meeussen 1967; Du Plessis 1982; Visser 1989; Creissels and Godard 2005). On one hand, the Bantu infinitive exhibits properties which are typical of nominal elements; it appears in subject and object NP positions, is associated with concordial agreement, is available for nominal modification and is often associated with a nominal prefix. However, in many Bantu languages the infinitive can also be inflected for tense, aspect and mood, can be negated, can be extended by the addition of verbal suffixes, may take an object or objectival concord and can be modified by adverbs and locatives, all of which are properties commonly associated with verbs.

The same nomino-verbal properties are exhibited by the Rangi infinitive. Thus, the Rangi infinitive can function as nominal element. It can assume the role of the subject of a clause (222) or an object (223).

(222) k~~u~~-ter-er-a ma-sare y-á ~~u~~-loongo sí vy-aboh-a t~~u~~k~~u~~
INF-listen-APPL-FV 6-words 6-of 14-lies NEG 8-be.good-FV NEG
'To listen to lies is not good'

(223) k~~u~~-sangir-iy-a mb~~ú~~rí na mpichi pát-a ú-r~~i~~
INF-mix-CAUS-FV 10.goats CONN 10.hyenas get-FV SM2nd sg-AUX
hasara
10.problems
'Mixing goats and hyenas will bring you problems'

The nominal use of the infinitival verb can be seen in example (224), where it is functioning as the object of a clause.

(Stegen 2002:22)

(224) mo-osí é-énd-iré k~~u~~-sék-a kw-áányu maát~~u~~k~~u~~
1-old.man SM1.PAST1-love-PERF INF-laugh-FV 15-your(pl) very.much
'The old man loved your laughing very much'

Other nominal properties of the infinitive include its use alongside demonstratives (225) and that it is available for modification by adjectives (226) and ordinal and cardinal numbers ((227) and (228)).

(225) ha-ra k~~u~~-l~~u~~man-~~i~~r-a (Dunham 2005:105)
16-DEM 15-meet-APPL-FV
'Café'
(lit.: 'Place for meeting')

(226) k~~u~~-terek-a kw-ááche kwa-booh-a
INF-cook-FV 15-his/her 15-be.good-FV
'His/her good cooking'

(227) k~~u~~-tu kw-a ka-v~~i~~r~~i~~ (Dunham 2005:112)
15-listen 15-of 15-two
'Second listening, to hear for the second time'

(228) k~~u~~-l~~u~~m-a ka-m~~u~~d~~u~~ (Dunham 2005:101)
15-bite- FV 15-one
'To bite once'

The Rangi infinitive also exhibits verbal characteristics. These include the availability of the Rangi infinitive to be modified by the addition of the verbal extensions (as outlined in section 2.4.5), and its ability to host an object marker. This can be seen in example (229) below, where the class 9 object marker ~~í~~- is prefixed onto the stem in the infinitive.

(229) na-sáák-í-ire ku-~~í~~-ón-a (Stegen 2002:21)
SM1st sg.PRES-want-APPL-PFV INF-OM9-see-FV
'I have looked for it'
(lit.: 'I have searched for seeing it')

The Rangi infinitive appears with either the class 15 prefix *k~~u~~-* or in the bare form, in which case it is comprised of solely the verb stem. When the infinitive appears as the subject of a clause, the *k~~u~~-* prefix is consistently present as in examples (230) and (231) below.

(230) k~~u~~-ker-a m~~u~~-ti n~~í~~ i-paanga vya-faf-a
INF-cut-FV 3-tree COP 5-machete 8.PRES-be.hard-FV
'Cutting a tree with a machete is difficult'

(231) sik~~u~~ i-ji k~~u~~-fyet-~~u~~l-a matofali n~~í~~ ki-intu cha-k~~úú~~l~~u~~
10.days DEM-10 INF-make-SEP-FV 6-bricks COP 7-thing 7-big
'These days, making bricks is a big thing'

When the infinitive appears as the complement of a verb, there is more flexibility regarding the presence or absence of the *k~~u~~-* prefix. Example (232) contains both a prefixed and a prefixless infinitive. Example (233) show the infinitive in the bare verb form, whilst example (234) shows the infinitive hosting the *k~~u~~*-prefix.

(232) n-a-sít-ire dom-a na mashin-íi k~~u~~-shir-w-a
SM1st sg-PAST-refuse-PTV go-FV CONN 9.machine-LOC INF-mill-PASS-FV
'I refused to go to the machine to mill'

(233) n-óó-sáák-a r~~i~~m-a i-y~~uu~~nda r-áán~~i~~
SM1st sg-PROG-want-FV farm-FV 5-farm 5-my
'I want to dig my farm'

(Stegen 2002:21)

(234) maá mi-ísoori y-ááchwe ya-ka-ánd-a k~~u~~-f~~ú~~m-a
then 6-tear 6-his/her SM6-CONSC-begin-FV 15-come.from-FV
'…and then [his/her] tears started [their] occurrence'

The presence or absence of the *k~~u~~-* prefix on the infinitive in Rangi is the subject of some debate. Whilst Dunham (2005) notes that the presence or absence of the *k~~u~~-* prefix is used to encode the proximity of the future tense, she does not comment on its distribution in other contexts in the language. Dunham (2005) also makes no reference to the immediate future tense which the current study has found to be

formed using the auxiliary -*íise*. The formation of the immediate future tense with the auxiliary -*íise* was also noted in Stegen (2006). In contrast to this, Stegen (2006) claims that the presence or absence of the *kʉ-* prefix is related to the certainty of the future expression being conveyed. Thus, the presence of the prefix *kʉ-* encodes an uncertain future whilst the absence of the prefix encodes a certain future meaning. The present study has found the presence or absence of the prefix to be determined by a number of factors. These include phonological considerations such as whether the verb stem is vowel-initial or monosyllabic, as well as nominal versus verbal distribution. Further research is required however, including an examination of the role of information structure, to form a conclusive account of the distribution of the *kʉ-* prefix in Rangi.

Rangi is also not alone amongst Bantu languages in having more than one form of the infinitive. Riedel (2009:26) notes that the Tanzanian Bantu language Sambaa (G20) also exhibits a distinction between the standard infinitive that hosts the class 15 infinitival prefix *ku-*, and a form which appears without the prefix. In Sambaa one context for the prefixless infinitive is when it is used alongside the preposition *kwe* as can be seen in example (235) below.

(235)	ni-ita	kwe	kama	mee	(Riedel 2009:26)
	SM1st sg-go.PRES-CJ	17.PREP	milk	6.milk	
	'I am going to milk'				
	(lit.: 'I am going to milk the milk')				

The same has been noted in the Bantu language Lusaamia (J34), spoken in Kenya and Uganda, in which the infinitive appears in one of two forms. One form of the Lusaamia infiitive appears with the prefix *oxu-* which is considered a reflex of the common Bantu class 15 prefix. The other form of the infinitive appears with the prefix *oo-*, which is considered to be an innovation developed via the reinterpretation of grammatical distinctions borrowed from the neighbouring Nilotic language Dholou (Botne 2004). In Lusaamia these two forms of the infinitive have developed to encode specificity distinctions. The result is that the *oxu-* prefix isused to encode a specific reading whilst *oo-* is used for non-specific expressions.

Hadermann (1999) identifies eleven languages exhibiting two infinitival forms in the northern part of the Bantu domain (zones B, C, and D). However, of these eleven languages, only three – Mboshi (C25), Nyanga (D43) and Bembe (D54) – exhibit a grammatical distinction between the infinitival forms. The others appear to represent either dialectal differences or arbitrary use (Hadermann 1999:437). In Mboshi the infinitive prefix is *i-* when it follows the verb *ikanza* 'forbid' and when it follows prepositions. However, the infinitival prefix is *o-* when it appears after auxiliary verbs (other than *ikanza*) and in periphrastic constructions. The infinitival form in Mboshi can therefore be considered to be determined by syntactic considerations. In Gehimba (B30, Gabon), the distinction in the form of the infinitive is realized as the presence or absence of an initial high tone augment on the infinitival prefix *mo-*. This distinction denotes determinate and indeterminate reference (Hadermann 1999).

2.6 Summary

This chapter has provided an overview of the grammar of Rangi. Since Rangi is an under-documented language, the grammar sketch presented in this chapter forms a necessary background for the discussion of Rangi auxiliary constructions which comprises the focus of Chapter 3. The chapter began with an overview of Rangi nominal morphology. Section 2.3.1 examined the noun classes, whilst section 2.3.2 looked at nominal derivation. The modifying elements found in Rangi, such as the associatives, adjectives, cardinal and ordinal numerals, personal, demonstrative and possessive pronouns, quantifiers were then presented in turn. The locative suffix and the formation of interrogatives were also presented. Section 2.4 examined Rangi verbal morphology, looking at the structure of the verbal template and the expression of tense-aspect information in both simple and complex constructions. Negation was the focus of section 2.4.4, whilst verbal derivation was discussed in section 2.4.5. The final part – section 2.5 – of this chapter provided an overview of syntactic considerations. Section 2.5.1 looked at prepositions and conjunction in Rangi, whilst 2.5.2 looked at the form of the infinitive. This sketch was provided as a background to the in-depth examination of Rangi auxiliary constructions presented in Chapter 3 and the analysis of Rangi auxiliary constructions presented in Chapters 5 and 6.

3 Rangi auxiliary constructions

3.1 Introduction

Chapter 2 provided an overview of Rangi grammar, outlining the basic characteristics of verbal and nominal morphology, as well as some of the key issues pertaining to Rangi morphosyntax. This was done with the aim of providing the background necessary for understanding the formal analysis of Rangi auxiliary constructions established in Chapters 5 and 6. The current chapter aims to present a more focused examination of auxiliary-based constructions in Rangi, further exemplifying their distribution and form. The first half of the chapter presents a discussion of the function and distribution of auxiliaries and copulas in Rangi. The second half provides data illustrating the marked infinitive-auxiliary order found in Rangi. The syntactic factors affecting its occurrence are also discussed.

Bantu languages regularly use sequences of verbs to express certain tense and aspect combinations. These are typically comprised of one or more auxiliary form followed by an inflected main verb (Henderson 2006:2). In some languages, each of the verbs in serial verb constructions carry full agreement with the subject of the clause (236), whilst in other languages only one of the two forms is inflected ((237) and (238)). Some Bantu languages also allow compound verb constructions comprising three verbs ((239) and (240)) (data from Nurse (2003:91)).

(236) xʊ-xa-lɪ xʊ-xʊ-gʊla [Kimbu]
SM1stpl-still-be SM1stpl-PRES.PROG-buy
'We are still buying'

(237) ti-na ku-gúla [Chichewa]
SM1stpl-PAST INF-buy
'We were buying'

(238) tu-tenda ku-hemera [Ngindo]
SM1stpl-do INF-buy
'We are buying'

(239) saa tu-va tu-gus-ile [Hehe]
come-FUT SM1stpl-be SM1stpl-buy-RETR
'We will have bought'

(240) da-àà ù-li dú-tààli dù-líí-gúlà [Sukuma]
SM1stpl-PAST-be SM1stpl-still.be SM1stpl-PRES.PROG-buy
'We were still buying'

Rangi employs both simple and complex verb forms to encode temporal and aspectual distinctions. Simple verb forms comprise a single verb inflected for tense and aspect. This tense and aspect information is encoded through the presence of morphological marking in the pre-verb stem slot 3 position and/or the post-verb stem position (Meeussen's (1967) slot 7). Complex verbal constructions are comprised of an inflected auxiliary form and a main verb that may either be inflected or appear in an infinitival form. In compound constructions, the auxiliary typically contributes the temporal information whilst the main verb makes the lexico-semantic contribution to the clause. The main verb is also responsible for the introduction of aspectual information (when present). These complex constructions, in which one verb (often the auxiliary) makes the temporal contribution to the clause and the other (typically a main) verb makes the aspectual contribution to the clause, are common across Bantu languages (Nurse and Philippson 2003; Nurse 2008:92).

Rangi has a large inventory of copula and auxiliary forms all of which are used to encode a range of tense-aspect distinctions. Akhavan-Zandjani (1990:54) notes four different forms to express the verb 'to be':

> First, with the particle *ni* and its negation *si;* secondly, with -*va;* thirdly with -*vija* which only occurs in the progressive aspect; and fourthly, with -*ri*"
>
> (Akhavan-Zandjani (1990:54), translation in Stegen (2001:1))

Departing from Akhavan-Zandjani's (1990) categorization, Stegen (2001) considers -*vijáa* to be subsumed under -*vá,* comprising the root -*víj* (an allomorph of -*v* 'become, be'), the habitual extension -*á* and the final vowel -*a*. The present study follows the analysis provided by Stegen (2001) under which -*víj* is treated as an

allomorph of -*vá.* The copulas under discussion therefore include the invariable copula *nɨ́* and its derived form *noó,* the negative copula *sí* and the multifunctional copula -*rɨ*. The auxiliary of process -*vá*, the past tense auxiliary -*ija,* the immediate future auxiliary -*íise* and the possessive auxiliary -*tɨite* 'have' are also examined.

The current chapter presents the range of auxiliaries and copulas found in Rangi, focusing on their distribution and interpretation. Data exemplifying the use of these auxiliary elements in context is followed by a discussion of the relative positioning of auxiliaries with regard to the other constituents in the clause. This discussion situates the marked infinitive-auxiliary order in context and show the distribution of other auxiliaries within the language. Specifically, it shows that the majority of Rangi auxiliaries and copulas appear in the standard preverbal position. However, the auxiliaries -*íise* and -*rɨ* form part of the infinitive-auxiliary order and are found in the marked postverbal position.

3.2 Auxiliaries and copulas

3.2.1 The copula *nɨ́*

The simple copula *nɨ́* is used extensively in Rangi. Its most common function is in basic predication, where it links the subject of the sentence with an adjectival predicate (241) or nominal predicate (242).

(241) í-kí k~~i i~~nt~~u~~ n~~ɨ~~ ch-óócho (Stegen 2001:6)
DEM-7 7-thing COP 7-true
'This thing is true'

(242) ~~u~~-do kiri n-k~~uúlu~~ n~~ɨ~~ sa kolo-~~i~~r-a i-r~~usu~~
14-millet really 9-big COP for stir-APPL-FV 5-home.brew
'[*Udo*] millet is mainly for making home brew'

The copula *nɨ́* is also used to introduce the agent by-phrase (when present) in passive constructions ((243) and (244)).

(243) inkwi i-ji j-á-tem-irwé ní á-vá
10.firewood DEM-10 SM10-PAST1-cut-PASS.PERF COP DEM-2
va-temainkwi
2-lumberjacks
'This firewood was cut by those lumberjacks'

(244) wa-nír-irwe ní mu-untu
SM2nd sg.PERF-call-PASS.PERF COP 1-person
'You have been called by someone'

The copula can also be employed to introduce a focus reading on a subject noun phrase (245), an object noun phrase (246), a question word (247) and a temporal adverbial (248).[37]

(245) ní mbúri vii noó jí-chúúng-irwé na ndihi
COP 10.goats only COP SM10.PERF-tie-PASS.PERF CONN 9.rope
ng'oombe tuku
10.cows NEG
'It is only the goats that were tied with a rope, not the cows'

(Stegen 2008:6)

(246) kuumba ní i-tumbetu rí-mú-kor-íire
CNTREXPECT COP 5-tobacco SM5-OM1-sprout-REL.APPL.PTV
mpul-íi
9.nose-LOC
'Oh, it is the tobacco that has sprouted in his nose'

(247) ní a-rikwi á-mu-túk-iré u-hu mama
COP SM1-which SM1past1-OM1-offend-PERF DEM-1 1a.mother
'Who (which person) is it that offended that woman?'

(248) ní u-hu mw-aáká á-vyáal-w-a (Stegen 2008:6)
COP DEM-3 3-year SM1-give.birth-PASS-FV
'This year, she was born'

3.2.2 The copula *noó*

Stegen (2001) considers *noó* to be a combination of the copula *ní* and the referential marker *-oo*, noting the basic function of *noó* being to refer back to a topic which has already been mentioned in the discourse. Whilst the current study considers *noó* to be derived from the copula *ní*, the functions of *noó* are considered to be distinct

[37] The gloss PTV=perfective contrasts with PERF= perfect.

enough to warrant a separate examination of its usage. As a variant of the copula *nɨ́*, *noó* functions predicatively to link the subject of a sentence with an adjectival or nominal predicate, as in example (249).

(249) ma-taanga noó chá-k~~u~~rya ki-k~~uu~~l~~u~~ k~~ɨ~~-chik-ii (Stegen 2001:7)
6-pumpkin COP 7-food 7-big 7-rainy.season-LOC
'Pumpkins are the main food during the rainy season'

The copula *noó* is also used in giving a definition or introducing a person's name. In this use it forms part of a complex construction where it appears in combination with the passive form of *-séya* 'say', as can be seen in examples (250) and (251).

(Stegen 2001:7)
(250) mo-osí ~~u~~-mw~~ɨ~~ á-se-w-áa noó Mo-osí Ibuuwo
1-old.man 1-one SM1.PAST-say-REL-PASS-HAB COP 1-old.man Ibuwo
'…an old man who was called Old Ibuwo'
(lit.:'…an old man who was said to be Old Ibuwo')

(251) a-ha noó Kidulo k~~u~~-sé-w-áa
DEM-16 COP Kidulo 17-say-PASS-HAB
'This area is called Kidulo'

The copula *noó* is used in introducing subordinate clauses expressing the purpose of the action or event described in the main clause, as can be seen in examples (252)–(254) below.[38]

(252) ry~~uu~~r~~ɨ~~́r-á mb~~u~~́ri noó ríis-y-a (Stegen 2001:7)
untie-IMP 10.goat COP feed-CAUS-FV
'Untie the goats (in order) to graze [them]'

(253) dóm-a nd~~ɨ~~́-r~~ɨ~~ na l~~u~~-~~u~~l-wíi noó kwaat-a
go-FV SM1st sg-AUX CONN 11-mountains-LOC COP catch-FV
namaha
10.termites
'I will go to the mountains (in order) to catch termites'

[38] This use of *noó* is comparable to *sa* 'in order to', which is also responsible for the introduction of purposive clauses (described in section 2.5 above). However, the difference between *sa* and *noó* relates to the types of clauses they can introduce. Whilst *sa* functions to relate a purpose for a noun, *noó* introduces purposive clauses which are verbal in nature.

(254) n~~ɨ~~ɨ́n~~ɨ~~ n-á-dóm-iré noó haand-a mbeyu
1st sg.PP SM1st sg-PAST-go-PERF COP plant-FV 9.seeds
'I am going (in order) to plant seeds'

3.2.3 The negative copula *sí*

The copula *sí* is the negative counterpart to the simple copula *n~~ɨ~~* and its primary function is predication in negative constructions. The copula *sí* is regularly used alongside the negative polarity item *t~~u~~k~~u~~*, as can be seen in examples (255)–(257) below.

(255) ~~u~~-h~~u~~ sí mo-osí Leo t~~u~~k~~u~~
1-DEM NEG 1-old.man Leo NEG
'This is not Mr Leo'

(256) weéwe sí m~~u~~-l~~ii~~h~~ɨ~~ t~~u~~k~~u~~, n~~ɨ~~ m~~u~~-kufi
2nd sg.PP NEG 1-tall NEG COP 1-short
'You are not tall, you are short'

(257) ~~ɨ~~-k~~ɨ~~ k~~ɨ~~-kombe sí ch-aan~~ɨ~~ t~~u~~k~~u~~, n~~ɨ~~ ch-ááchwe
DEM-7 7-cup NEG 7-my NEG COP 7-his/her
'This cup is not mine, it is his/hers'

The negative copula *sí* also plays a role in sentential negation where it is used alongside *t~~u~~k~~u~~* to negate a verb form. This can be seen in examples (258) and (259) below.

(258) sí n-íyó-dóm-a t~~u~~k~~u~~
NEG SM1st sg-PROG-go-FV NEG
'I am not going'

(259) m~~u~~-sungaati sí a-long-aa na m~~u~~-keva
1-rich.person NEG SM1.HAB-spend.the.day-PRES.HAB CONN 1-poor.person
t~~u~~k~~u~~
NEG
'A rich person does not spend the day with a poor person'

3.2.4 The past tense auxiliary *-íja*

The past tense auxiliary *-íja* is used in the formation of compound constructions which encode the distant past habitual and the distant past perfective tenses. Both of

these are constructed using the past tense auxiliary *-ija* and a main verb. Whilst the auxiliary is inflected for subject information, the main verb is inflected for subject agreement and aspectual information. According to Stegen (2001), the auxiliary *-ija* is derived from the verb *-~~u~~ja* 'to come'. The distant past perfective use of *-ija* can be seen in examples (260) and (261) below, where the auxiliary is followed by a verb form inflected for perfective aspect by the suffix *-ire*.[39]

(260) v-ija va-t~~ii~~te ~~u~~-jusi w-óó rut-a
SM2-AUX.PAST2 SM2PERF-have.PERF 14-knowledge SM14-of forge-FV
'They used to be blacksmiths'
(lit.: 'They used to have the knowledge of forging')

(261) a-ija m~~u~~-dúúdi a-ija i-i-fyeen-ire
SM1-AUX.PAST2 1-small SM1-AUX.PAST2 SM1-REFL-ressemble-PERF
na íyo w-aavo
CONN 1a.mother SM1a-their
'When s/he was small s/he looked like their mother'

The distant past perfective auxiliary *-ija* is also used in the formulaic opening of a narrative in the phrase *kwija kwat~~ii~~te* 'one upon a time', as can be seen in example (262) below.

[MD.H&H.PS-3]

(262) kw-ija kwa-t~~ii~~te nch~~u~~ng~~u~~la na mpichi
17-AUX.PAST2 17.PAST-have 9.hare CONN 9.hyena
'There was a hare and a hyena…'

The distant past habitual use of the auxiliary *-ija* can be seen in examples (263) and (264) below, where the main verb is inflected for habitual aspect by the suffix *-áa*.

(Dunham 2005:157)

(263) tw-ija twí-kikal-áa Kondoa maa
SM1stpl-AUX.PAST2 SM1stpl.PAST-stay-PAST.HAB Kondoa then
tu-ka-sáám-a na London
SM1stpl-CONSC-move-FV CONN London
'We used to live in Kondoa, then we moved to London'

[39] The perfect suffix *-ire* is not visible in example (260) since *-t~~ii~~te* is a defective verb and appears only in the perfective form *-t~~ii~~te*. See section 3.2.6 for further examples.

(Dunham 2004: 20)

(264) ha-ant~~u~~ n-óó-kíkal-áa amerikan-íi
16-place SM1st sg-PROG-stay-PAST.HAB 9.America-LOC
si-ni-ija n-óó-t~~u~~mam-a benk-íi t~~u~~k~~u~~
NEG-SM1st sg-AUX.PAST2 SM1st sg-PROG-work-FV 9.bank-LOC NEG
'When I lived in America I didn't work in a bank'

3.2.5 The auxiliary of process *-vá*

The auxiliary *-vá* is most commonly used to denote a process of change of state. It regularly appears alongside a verb inflected with the consecutive prefix *ka-* or the subjunctive suffix *-e*. It also appears with the past habitual suffix *-áa* in the formulaic introduction to a story. The auxiliary *-vá* is used to express an existential process or the meaning 'to become', where it can appear with a adjective or nominal attribute (267), or with an inflected verb form (266).

(Stegen 2001:3)

(265) Moosí Chobu a-ka-vá a-dáláh~~i~~r-e maát~~u~~k~~u~~
1.old man Chobu SM1-CONSC-AUX SM1-be.old-SUBJ very.much
'Old Chobu had become very old'

The auxiliary *-vá* can be used with a inflected verb form (265), or a nominal or adjectival attribute (266). It is also possible for *-va* to appear as an infinitival verb form, in which case it hosts the class 15 infinitival prefix *k~~u~~-* (268).

[MD.NPD-58]

(266) a-ka-séy-a rek-a u-vá na mw-aana
SM1-CONSC-say-FV leave-FV SM2nd sg-AUX CONN 1-child
'He said: Wait until you have a child.'

(267) n~~i~~ín~~i~~ n-a-vá m~~u~~-keva
1st sg.PP SM1st sg-PAST2-AUX 1-poor.person
'I became poor'

(268) koóni twa-r~~i~~m-ire vya-booha nkua j-ííswi
if SM1st pl.PAST-farm-PTV 8-be.good-FV 10.maize 10-our
k~~u~~-vá ji-r~~i~~ ja-booh-a
INF-AUX SM10-AUX 10-be.good-FV
'If we farm well, our maize will be good'

The auxiliary -*vá* can host the subjunctive suffix -*e* (269). When used with the conjunction *na* 'with, and', the auxiliary -*vá* encodes a possessive interpretation, although the notion of a process of change of state is still found (270).

(269) ú-v-e m~~u~~-k~~úúlu~~ (Stegen 2001:3)
SM2nd sg-AUX-SUBJ 1-big
'May you become great'

(Stegen 2001:4)

(270) kira m~~u-un~~t~~u~~ a-ka-vá na kaaya y-aachwe
each 1-person SM1-CONSC-AUX CONN 9.home 9-his/her
'And each person got to have his own home'

The use of the auxiliary -*vá* with the irrealis suffix -*e* and the conjunction *na* 'with, and' in example (271) below, results in an ambiguity between an interpretation of existential change, expressing the wish that the 'children become healthy' and a more general statement that the children 'be healthy'.

(271) t-óó-sáák-a va-ana v-iit~~u~~ va-v-e na
SM1st pl-PROG-want-FV 2-children 2-our SM2-AUX-SUBJ CONN
afya ya-booh-a
9.health 9.PRES-be.good-FV
'We want our children to be healthy'
(lit.: We want our children to be with good health')

According to Stegen (2001:4), the root -*vij* used in the formation of the formulaic introductory statement at the beginning of a narrative, is an allomorphic realisation of the auxiliary -*vá*. This can be seen in example (272) below.

(Stegen 2001:4)

(272) á-hó kal~~i~~ kwá-víj-áa kwá-t~~ii~~te
DEM-16 old.time 17.PAST-AUX-PAST.HAB SM17-AUX.HAVE
mo-osí ~~u~~-mw~~i~~
1-old.man 1-man
'Once upon a time, there was an old man'

To summarise, the auxiliary -*vá* is commonly associated with the meaning 'to be'. However, when used with the consecutive prefix -*ka*-, the irrealis suffix -*e* and the habitual suffix -*á*-, its primary function is to denote a process or change of state,

reflecting an interpretation more similar to the meaning 'to become'. Used in combination with the conjunction *na* 'with, and', it assumes a possessive function. The most restricted use of the auxiliary *-vá* is in narratives where its use alongside the habitual suffix *-á-* serves as an introductory statement at the beginning of a narrative. In this use it has the allomorphic realisation *-vij*. The next sub-section examines the distribution and function of the possessive auxiliary *-tɨɨte*.

3.2.6 The possessive auxiliary *-tɨɨte*

The possessive auxiliary *-tɨɨte* is used in constructions to denote possession of a noun phrase by another noun phrase. The auxiliary appears only in the perfective aspect.[40] The auxiliary *-tɨɨte* is inflected for person and number, or noun class agreement. This can be seen in examples (273) and (274) below.

(273) na-tɨɨte va-ki va-vɨrɨ
SM1st sg-AUX.HAVE 2-wife 2-two
'I have two wives'

(274) wa-tɨɨte va-ana va-ngahi kaya kw-ááko
SM2nd sg-AUX.HAVE 2-sons 2-how.many 9.house 17-your
'How many children do you have at your home?'

The possessive auxiliary *-tɨɨte* can also be negated using a negative prefix on the auxiliary. The negative inflection on the possessive auxiliary form appears in the pre-initial position in the first person singular and in the post-initial position in all of the other person and number forms, is shown in Table 18.

Table 18: Negative possessive auxiliary forms

	Singular	**Plural**
First person	sintɨɨte	twasitɨɨte
Second person	usitɨɨte	musitɨɨte
Third person	asitɨɨte	vasitɨɨte

The negative possessive auxiliary is used alongside the negative polarity marker *tɨkɨ* which appears clause-finally, as can be seen in examples (275), (276) and (277) below.

[40] However, it shows an irregular form of imbrication meaning that the regular perfective suffix *-ire* is not found (Dunham 2004:21).

(275) n~~ɨ~~ni sin-t~~ɨɨ~~te k~~ɨ~~-taabu t~~u~~k~~u~~
1st sg.PP SM.NEG 1st sg-AUX.HAVE 7-book NEG
'I do not have a book'

(276) weéwe usi-t~~ɨɨ~~te i-chuumbi t~~u~~k~~u~~
2nd sg.PP SM.NEG 2nd sg-AUX.HAVE 5-chair NEG
'You (sg) do not have a chair'

(277) va-si-t~~ɨɨ~~te vi-ryo t~~u~~k~~u~~
SM2-NEG-AUX.HAVE 8-millet NEG
'They don't have millet'

3.2.7 The multifunctional auxiliary *-r~~ɨ~~*

The auxiliary *-r~~ɨ~~* has a number of functions. It appears as a simple copula in the present tense, possessive copula, locational copula and irrealis copula, as well as being used as an auxiliary in the recent past perfective and general future tense. In all contexts *-r~~ɨ~~* shows subject concord for person and number, or noun class. In its simple copula use, the primary function of *-r~~ɨ~~* is to link the subject of a sentence with the predicate. In this function, *-r~~ɨ~~* is inflected for subject information and typically precedes the attributive adjective, as can be seen in examples (278) and (279), or the noun, as can be seen in example (280).

(278) weéwe ú-r~~ɨ~~ m~~u~~-kufi
2nd sg.PP SM2nd sg-AUX 1-short
'You are short'

(279) ma-tunda y-á m~~u~~-ti ~~u~~-h~~u~~ yá-r~~ɨ~~ ma-k~~úúlu~~
6-fruits 6-of 3-tree 3-DEM SM6-AUX 6-big
'The fruit of this orange tree are big'

(280) n~~ɨ~~n~~ɨ~~ nd~~ɨ~~-r~~ɨ~~ mw-aarímu
1st sg.PP SM1st sg-AUX 1-teacher
'I am a teacher'

When used in combination with the conjunction *na* 'and, with', *-r~~ɨ~~* can also be used to create a possessive construction. This can be seen in examples (281) and (282) below.

(281) ndí-rɨ na njala
SM1st sg-AUX CONN 9.hunger
'I am hungry'
(lit.: 'I have hunger')

(282) á-rɨ na vi-jombulo vi-kúúlu
SM1-AUX CONN 8-calves 8-big
'S/he has big calf muscles'

A sub-function of the predicative use of *-rɨ* is its regular use in the adjectival construction *-rɨ foo* 'many, lots'. In this construction, *-rɨ* follows the noun phrase that is being modified and shows subject agreement with the noun. This can be seen in examples (283) and (284) below.[41]

(283) mu-ti w-a-tung-á ma-tunda ya-rɨ foo u-hu
3-tree SM3-PAST-bear-PAST2 6-fruits SM6-AUX lots 3-DEM
mw-aáká
3-year
'The tree has born many fruits this year'

(284) kw-áá-rɨ na ma-chu ma-kúúlu ya-rɨ foo na
17-PAST1-AUX CONN 6-clouds 6-big SM6-AUX lots CONN
ch-uuri
7-mid-morning
'There were lots of big clouds in the mid-morning'

The auxiliary *-rɨ* also has a locational function where it is used to locate a noun. The location encoded by *-rɨ* may be either specific (285) or general (286).

(285) ma-unda y-áávo nɨ́ ma-dúúdi-dúúdi keyi ya-rɨ ku-li-ku-li
6-farm 6-their COP 6-small-small again SM6-AUX far-far
'Their farms are small and they are far away from each other'

(286) ku-ta-a mpeesa ú-rɨ safari-íi
INF-loose-FV 9.money SM2nd sg-AUX 9.journey-LOC
kwa-ret-aa u-sumpufu
INF-bring-HAB 14-trouble
'Losing money when you are on a journey brings trouble'

[41] As can also be seen in example (284), *-rɨ* can be inflected for recent past by the past tense prefix *áá-*. This construction is examined in further detail in section 3.2.7.

The locational use of *-rɨ* is also used to ask a question about someone or something's location, as can be seen in examples (287) and (288) below.

(287) John hayi á-rɨ ?
John where SM1-AUX
'Where is John?'

(288) haaha nɨ́ hayi á-rɨ na yeéye nɨ́ ani
now COP where SM1-AUX CONN 3rdsg.PP COP who
'Where is s/he now and who is s/he?'

I further propose that *-rɨ* also comprises part of the locational construction formed using *-mwaarɨ*, which coveys the meaning 'to be (in a place)'. Stegen (2001:5) suggests that *-mwaarɨ* might also include a vestige of the Bantu noun class 18 *mu-* which is otherwise absent in Rangi, although it appears to have undergone reanalysis to appear as *-mwaarɨ*.[42] The locational construction formed using *-mwaarɨ* can be seen in examples (289), (290) and (291) below.

(289) mu-dala na a-mwaarɨ ush-a vi-ryo
1-old.woman CONN SM1-AUX.LOC mill-FV 8-millet
'The old woman is [at the place of] grinding millet'

(290) suúsu na tu-mwaarɨ Gubali
1stpl.PP CONN SM1stpl-AUX.LOC Gubali
'We are in Gubali'

(291) u-hú mu-waanga a-mwáári? (Stegen 2001:6)
1-DEM 1-doctor SM1-AUX.LOC
'Is the doctor here?'

The auxiliary *-rɨ* also appears in an irrealis construction which takes the form *-kaarɨ* and denotes that an action or event is yet to take place. Stegen (2001) suggests that historically *-kaari* might be a lexicalized combination of the consecutive prefix *-ka-* and the copula *-rɨ*.

[42] The use of the conjunction *na* 'with, and' in this construction seems to reflect an apparent move towards the use of *na* instead of *nɨ* in restricted syntactic contexts (for more on this see Stegen (2011)).

(292) va-zazi v-áávo va-va-rek-á va-kaa-r~~ɨ~~ va-dúúdi víi
2-parents 2-their SM2.PAST-OM2-leave-FV 2-IRR-AUX 2-small only
'Their parents left them when they were still small'

The functions of the auxiliary *-r~~ɨ~~* therefore include its basic predicative use, as a possessive copula, where it appears alongside the preposition *na* 'with, and', as a locational copula – both on its own and as part of the *-mwaar~~ɨ~~* construction – and as part of the irrealis construction where it appears as part of the *-kaar~~ɨ~~* construction.

The auxiliary *-r~~ɨ~~* is also used to form part of the recent past perfective tense and the general future tense. The recent past perfective is formed using a compound construction with *-r~~ɨ~~* is inflected for person and number (or noun class) and for past tense by the prefix *-áá-*. This inflected auxiliary precedes a verb form which shows obligatory subject concord and is inflected for past tense by the prefix *a-* and for perfective aspect by the suffix *-ire*. The structure of the recent past perfect is therefore SM-áári SM-a-H-ire.[43] This can be seen in examples (293) and (294) below.

(293) áá-r~~ɨ~~ a-dóm-ire koo huung-a mbalaasi
SM1.PAST-AUXSM1.PAST-go-PTV DIR harvest-FV 10.cowpeas
'S/he went to harvest cow peas'

(294) n-áá-ri n-a-téy-ire m~~u~~-teho w-áán~~ɨ~~ noo
SM1st sg-PAST-AUX SM1st sg-PAST-set-PTV 3-trap 3-my COP
kwat-a tumbiri
catch-FV 10.monkey
'I have set my traps to catch the monkeys'

The auxiliary *-r~~ɨ~~* is also used in negative forms of the recent past perfective conjugation. This can be seen in example (295) below where the auxiliary-based compound construction is preceded by the negative copula *sí* and followed by the negative marker *t~~u~~k~~u~~*.

[43] A dialectal variant of the past perfective which uses just the past tense marker *áá-* without the presence of the copula *-r~~ɨ~~* also exists. This variant takes the form SM-áá SM-a-H-ire. For more on this see section 2.4.3.

(295) sí n-áá-r~~ɨ~~ na-m~~ʉ~~-tang-irye ~~ʉ~~-h~~ʉ~~ t~~ʉ~~k~~ʉ~~
NEG SM1st sg-PAST-AUX SM1st sg-OM1-know-APPL.PTV 1-DEM NEG
'I did not know him/her at all'

The auxiliary *-r~~ɨ~~* is also used in the formation of the general future tense. The general future tense is comprised of an infinitival verb form and the auxiliary *-r~~ɨ~~*, which is inflected for subject information. In declarative main clauses, the infinitive consistently precedes the auxiliary, as can be seen in examples (296) and (297).

(296) a-ka-tááng-a k~~ʉ~~-~~ú~~la-w-a á-r~~ɨ~~ (Stegen 2001:5)
SM1-CONSC-know-FV INF-kill-PASS-FV SM1-AUX
'He knew that he will be killed'

(297) k~~ʉ~~-sum-~~ʉ~~l-a nd~~í~~-r~~ɨ~~ namaha maa kálaang-a nd~~í~~-r~~ɨ~~
INF-collect-SEP-FV SM1st sg-AUX 10.termites then fry-FV SM1st sg-AUX
'I will gather termites and then I will fry them'

A more detailed analysis of the auxiliary use of *-r~~ɨ~~* and the associated infinitive-auxiliary order which is the focus of this thesis, is presented in section 3.3. The formal analysis of these constructions is taken up in Chapters 5 and 6. The next section examines the immediate future auxiliary *-íise*.

3.2.8 The immediate future auxiliary *-íise*

The auxiliary *-íise* appears in the immediate future tense where it appears alongside an infinitival verb form and expresses an event or action which is to occur in the near future. This can be seen in examples (298)-(300) below.

(298) k~~ʉ~~-pút-a n-íise a-ya ma-ua
INF-cut-FV SM1st sg-AUX DEM-6 6-flowers
'I will cut these flowers (soon)'

(299) k~~ʉ~~-ku-rúw-~~ɨ~~r-a n-íise chá-k~~ʉ~~rya haaha víi
INF-OM2nd sg-cook-APPL-FV SM1st sg-AUX 7-food now only
'I will cook food for you (right now)'

(300) dóm-a w-íise
go-FV SM2nd sg-AUX
'Will you (sg) go?

As can be seen on examination of the examples above, the auxiliary -*íise* shows obligatory subject concord and consistently appears after the infinitive. The infinitive can appear either in the bare form or with the class 15 prefix *kʉ-*. Other dependents such as objects and adverbial phrases remain in-situ, appearing after the infinitive-auxiliary construction. The participation of the auxiliary -*íise* in the infinitive-auxiliary construction is examined in further detail in section 3.3 below.

Before discussing the Rangi infinitive-auxiliary order in more detail, it is also relevant to note that there are a number of examples in which auxiliaries appear clause-finally in non-future contexts. This occurrence appears to be restricted to a specific syntactic context in which the copula *nɨ* is used alongside another auxiliary being used predicatively. This can be seen in the examples (301)–(303) below where the auxiliary -*rɨ* is used in conjunction with the copula *nɨ́* .

(301) mʉ-ki w-ááchwe nɨ́ nyʉʉmb-íi á-rɨ
1-wife 1-his/her COP 9.house-LOC SM1-AUX
'His wife is at home'

(302) va-ana v-á mbʉ́ri koóni v-íyó-káán-a na ki-yolwa
2-son 2-of 9.goat if SM2-PROG-cry-FV CONN 7-evening
u-taang-e vala-íyo-aavo nɨ́ njir-íi vá-rɨ
SM2nd sg-know-FV 2a-mothers-their COP 9.road-LOC SM2-AUX
'When goat kids cry in the evening you know that their mothers are on their way'

(303) va-singa nɨ́ mbari y-á kaaya v-áá-rɨ
2-children COP 9.helpers 9-of 9.home SM2-PAST-AUX
'The children were the helpers at home'

Another instance of this marked order can be seen in example (304) below, which employs the copula *nɨ́* in conjunction with an inflected verb form *vikalaa* 'they sit'. In this instance it is the verb phrase *vikalaa* which appears clause-finally.

(304) kooni kwa-v-ire na kɨ-rɨro v-aantu va-lʉme nɨ́
if 17-be-PTV CONN 7-bereavement 2-people 2-male COP
i-taanga vi-kal-aa na va-antu va-ki nyʉʉmb-íi
5-outside SM2-sit-HAB CONN 2-people 2-female house-LOC
'If there is a bereavement men sit outside and women sit inside'

This clause-final positioning of the auxiliary *-rɨ* can also be seen in example (305) below with the adjective of colour *-rɨ nkundu* 'red', which regularly is formed using the auxiliary *-rɨ*.

(305) vi-kóombe i-vi nɨ́ nkuundu vi-rɨ
8-cups DEM-8 COP red 8-AUX
'These cups are red'

It seems in these instances that the position of the inflected auxiliary within the clause is determined by considerations of information structure relating to the copula *nɨ́*. The use of this strategy seems to relate to pragmatic-saliency with the copula *nɨ́* acting as an attributive predicator with the temporal or locational information occurring as an afterthought. The exact topic and focus interaction that is involved in such constructions are beyond the remit of the current thesis, but the existence of such examples warrants further investigation in this area.

3.3 Rangi infinitive-auxiliary constructions

Despite otherwise head-initial syntax typically associated with SVO Bantu languages, Rangi exhibits infinitive-auxiliary order in restricted syntactic contexts. This infinitive-auxiliary order is not only atypical in the context of East African Bantu languages, it also contradicts Greenberg's (1963) proposed linguistic universal that Verb-Object languages exhibit auxiliary-infinitive order. The next half of this chapter explores the infinitive-auxiliary order found in Rangi, presenting the key facts that cause Rangi to stand out from a typological perspective. The data presented in this section form the empirical basis of the analysis provided in Chapters 5 and 6.

Infinitive-auxiliary order is attested in Rangi in the immediate and general future tenses. Both of these tenses are formed using a combination of an infinitive verb form and an inflected auxiliary. The immediate future is formed using the immediate future auxiliary *-íise* whilst the general future is formed using the auxiliary *-rɨ*. In both the general and the immediate future tenses, the infinitive consistently appears in a position preceding the auxiliary in main declarative clauses. However, in wh-questions, under negation, in focus constructions, relative and complementizer

clauses, the auxiliary appears before the infinitive. A discussion of the infinitive-auxiliary order found in declarative main clauses comprises the focus of section 3.3. This is followed by an examination of these 'alternation contexts', the syntactic contexts in which the order auxiliary-infinitive is found, in section 3.4.

3.3.1 The immediate future

The immediate future is used to describe an action or event which will happen imminently or in the very near future. It is formed through a compound construction, in which an infinitival verb form precedes the immediate future auxiliary *-íise.* The context in which the immediate future is used is typically one in which the action or event described by the verb is imminent. The sentence in (306) below is therefore appropriate for a situation in which the speaker has already started walking towards the goat.

(306) kw-~~i~~-sum-~~u~~l-a n-íise ~~i~~-h~~i~~ mb~~u~~ri haaha
INF-OM9-take-SEP-FV SM1st sg-AUX 9-DEM 9.goat now
'I will take this goat now'

The immediate future can also be used to describe events that will take place in the more distant future but for which the necessary preparations or actions have already begun. Thus, examples (307) and (308) below are appropriate only in a context where actions that are needed to plant millet or to build a house are already under way or are soon to be taken. The interpretation of these examples therefore infers the immediate future tense despite the use of the phrase *mwaáká ~~u~~h~~u~~* 'this year', which might be assumed to encode a more distant or general future.

(307) háánd-a n-íise vi-ryo ~~u~~-h~~u~~ mw-aáká
plant-FV SM1st sg-AUX 8-millet DEM-3 3-year
'I will plant millet this year'

(308) jéng-a n-íise mw-aáká ~~u~~-h~~u~~ ny~~uu~~mba y-á ki-temi
build-FV SM1st sg-AUX 3-year DEM-3 9.house 9-of 7-rich
'I will build a substantial house this year'

There may be an overt subject present in the construction (309). Alternatively, subject pro-drop may occur (310) and (311).

(309) n~~ɨ~~ínɨ dóm-a n-íise na Dodoma haaha
1st sg.PP go-FV SM1st sg-AUX CONN Dodoma now
'I will go to Dodoma now'

(310) kán-y-a n-íise ~~u~~-h~~u~~ m~~u~~-t~~ɨ~~
fell-CAUS-FV SM1st sg-AUX DEM-3 3-tree
'I will fell this tree'

(311) haaha sáw-~~u~~l-a tw-íise m~~u~~-bunge w-iisw~~ɨ~~
now pick-SEP-FV SM1st pl-AUX 1-politician 1-our
'Now we will choose our MP'

The infinitive may be in the bare form or be prefixed by the class 15 marker *k~~u~~-*. Dunham (2004; 2005) suggests that the presence of the infinitival prefix *k~~u~~-* carries semantic information pertinent to the interpretation of the future tense. This is further supported by Stegen (personal correspondence) who claims that the future constructions in which the infinitive carries the class 15 subject marker *k~~u~~-*encodes an uncertain future, whilst the future constructions which appear in the bare form encode a certain future. However, the current study did not find such a clear-cut distinction motivating the presence or absence of the infinitival prefix *k~~u~~-*. Rather the presence of this prefix was found to be dependent on a number of factors, including phonological factors, as well as semantic considerations. One such factor is that the infinitive typically carries the class 15 prefix *k~~u~~-* with a monosyllabic verb stem (312).

(312) suúsu k~~u~~-nyw-a tw-íise ay-a maaji
1st pl.PP INF-drink-FV SM1st pl-AUX 6-DEM 6.water
'We will drink this water'

The infinitive in future tense constructions may carry an object marker. In example (313), the verb *-terekera* 'cook for' is derived from the verb *-tereka* 'cook', by the addition of the applicative suffix *-er-*. This valency changing process introduces a benefactive object which is encoded by the object marker *k~~u~~-*. In example (314), the

object marker encodes a first person singular object by way of the object marker *-n-* which is prefixed onto the verb.

(313) k~~u~~-k~~u~~-térek-er-a n-íise chá-k~~u~~rya
INF-OM2nd sg-cook-APPL-FV SM1st sg-AUX 7-food
'I will cook food for you'

(314) weéwe kwa-n-térek-er-a w-íise chá-k~~u~~rya haaha
2nd sg.PP INF-OM1st sg-cook-APPL-FV SM2nd sg-AUX 7-food now
'You(sg) will cook food for me now'

The object marker may be co-referential with a following lexical object as can be seen in example (315). Alternatively, the object marker may be co-referential with a benefactive argument as in (316).

(315) kwi-~~i~~-s~~u~~m-~~u~~l-a n-íise ~~i~~-h~~i~~ mb~~u~~ri haaha
INF-OM9-take-SEP-FV SM1st sg-AUX 9-DEM 9.goat now
'I will take this goat now'

(316) kwa-n-térek-er-a v-íise chá-k~~u~~rya
INF-OM1st sg-cook-APPL-FV SM2-AUX 7-food
'They will cook food for me'

This section has shown examples of the immediate future tense which is formed using an infinitival verb form in combination with the immediate future auxiliary *-íise*. In main declarative clauses, the infinitive consistently precedes the auxiliary which shows obligatory subject agreement. The infinitive can be marked by the class 15 infinitival prefix *k~~u~~-* or may appear in a bare form. The infinitive may also host an object marker which may be co-referential with an object argument that plays either a theme or a benefactive thematic role.

3.3.2 The general future

The general future is also formed using an infinitive and an inflected auxiliary. However, the auxiliary used in the general future tense is the auxiliary *-r~~i~~*. The auxiliary shows obligatory subject concord and the infinitive is optionally prefixed by the class 15 infinitival marker *k~~u~~-*. The infinitive may also host an object marker. In general future main declarative clauses, the infinitive consistently precedes the

auxiliary (as was also seen for the immediate future tense in section 3.3.1 above). The general future is shown in examples (317) and (318) below.

(317) pát-a ú-r~~ɨ~~ sida m~~u~~n~~u~~m~~uu~~n~~u~~
get-FV SM2nd sg-AUX 10.problems lots
'You will have lots of problems'

(318) k~~u~~-chw-a tú-r~~ɨ~~ vi-ryo vi-húm-irwe k~~u~~-virw-a
INF-harvest-FV SM1st pl-AUX 8-millet 8-finish-PASS.PERF INF-ripen-FV
'We will harvest the millet when it has finished ripening'

In these general future constructions the subject (when present) is the first constituent. The subject is followed by the infinitive-auxiliary construction. (319). Subject pro-drop regularly occurs ((320) and (321)). Any dependent elements such as objects remain in-situ, appearing post-verbally (321).

(319) mama jót-a á-r~~ɨ~~ maaji mpol~~ɨ~~
1.mother get.water-FV SM1-AUX 6.water later
'Mother will get water later'

(320) fyuk-a á-r~~ɨ~~ koóni a-mak-~~ɨ~~rye kwer-a
return-FV SM1-AUX if SM1-finish-APPL.PERF winnow-FV
vi-ryo
8-millet
'S/he will come back once s/he has finished winnowing the millet'

(321) kw-ív-a ndí-r~~ɨ~~ i-chungwa
INF-steal-FV SM1st sg-AUX 5-orange
'I will steal an orange'

The infinitive can appear in the bare infinitive form (322) or it may carry the class 15 infinitival marker *k~~u~~-* (323).

(322) nyama kér-w-a í-r~~ɨ~~ na l~~u~~-fyo
9.meat cut-PASS-FV SM9-AUX CONN 11-knife
'The meat will be cut with a knife'

(323) i-soloondu kw-ambuk-a rí-r~~ɨ~~ ~~u~~-kuta
5-lizard INF-climb-FV SM5-AUX 14-wall
'The lizard will climb the wall'

There appears to be no restriction on the type of constituent that can follow the infinitive-auxiliary construction. The future infinitive-auxiliary constructions can have an instrumental adjunct ((325) and (326)) or direct object complements (324).

(324) m~~u~~-jengi isik~~u~~ noó vair-~~i~~r-a á-r~~i~~ i-baati r-á
1-builder 9.today COP roof-APPL-FV SM1-AUX 5-roof 5-of
shúúle
9.school
'The builder will put the sheets on the school roof today'

(325) balua kw-ánd-ik-w-a í-r~~i~~ n~~i~~ mw-aarimu na
9.letter INF-write-STAT-PASS-FV SM9-AUX COP 1-teacher CONN
kalamu
9.pen
'The letter will be written by the teacher with a pen'

(326) maama s~~u~~k-a á-r~~i~~ ndihi na m~~u~~-sore w-á kataani
1a.mother plait-FV SM1-AUX 9.rope CONN 3-fibre 3-of 9.sisal
'Mother will plait a rope with/from sisal fibers'

The infinitive-auxiliary order can occur alongside locational adjunctions ((327) and (328)).

(327) suúsu tá-a tú-r~~i~~ maaji a-ha kay-íi
1st pl.PP collect.water-FV SM1st pl-AUX 6.water DEM-16 9.house-LOC
'We will collect water at home'

(328) fí~~i~~r-~~i~~r-a vá-r~~i~~ mpol~~i~~ ha-ant~~u~~ maaji y-áá-r~~i~~ sir-a
jump-APPL-FV 2-AUX later 16-place 6.water 6-PAST-AUX finish-FV
'They will jump across (the river) later on when the water has gone'

Temporal adjuncts can also be used to modify the future infinitive-auxiliary constructions, as can be seen in examples (329) and (330) below.

(329) ya-nyw-a tú-r~~i~~ a-ya maaji a-ha víí
OM6-drink-FV SM1st pl-AUX DEM-6 6.water DEM-16 just
'We will drink this water soon'

(330) k~~u~~-~~ú~~j-a á-r~~i~~ na m~~u~~si
INF-come-FV SM1-AUX CONN 9.afternoon
's/he will come in the afternoon'

The infinitive-auxiliary construction can take a verbal complement, in which case the verbal complement follows the infinitive-auxiliary construction. This can be see in examples (331) and (332) below, where the verb forms *kʉikama* 'to milk it' and *kʉkʉambera* 'to help you' are complements of the verb *daha* 'be able'.

(331) mʉ-ʉntʉ mʉ-kúúlʉ dáh-a á-rɨ kʉ-ɨ-kam-a ɨ-hɨ
1-person 1-big able-FV SM1-AUX INF-OM9-milk-FV DEM-9
ng'oombe
9.cow
'An adult will be able to milk this cow'

(332) dáh-a ndɨ́-rɨ kʉ-ku-amb-er-a ʉ-hʉ mʉ-remo
able-FV SM1st sg-AUX INF-2nd sgOM-help-APPL-FV 3-DEM 3-work
'I will be able to help you with this work'

The infinitive-auxiliary construction can also taken an inflected verb as a complement. This can be seen in example (333) below, where the present progressive verb form *nóótereka* 'I am cooking' is the complement of the infinitive-auxiliary construction.

(333) va n-íise n-óó-térek-a
be.FV SM1st sg-AUX SM1st sg-PROG-cook-FV
'I will be cooking'

To summarise, on the basis of the data shown in this section, it can be seen that both the immediate future tense and the general future tense are constructed using an infinitive which is optionally prefixed by the class 15 infinitival marker *kʉ-* and may host an object marker. The infinitive consistently precedes the auxiliary, which in the general future tense is the auxiliary *-rɨ* and in the immediate future tense is *-íise*. In both instances, the auxiliary shows obligatory subject concord. When an overt subject is present, the subject is the first constituent in the clause, preceding the infinitive-auxiliary construction. Subject pro-drop also occurs regularly. If an object is present it remains in situ and appears after the inflected auxiliary. The infinitive-auxiliary construction can take a verbal, temporal or locational adjunct, as well as being able to take a direct object nominal.

3.4 The alternation contexts

Whilst declarative main clauses in both the immediate future tense and the general future tense exhibit infinitive-auxiliary order, these future tense constructions are associated with auxiliary-infinitive ordering when the future tense constructions is:

i) preceded by a wh-element,
ii) part of *sí...tʉkʉ* sentential negation,
iii) part of a relative clause,
iv) part of a cleft construction, or
v) preceded by *jooli* or *kooni*.

These alternation contexts are discussed in order below and are the subject of a formal analysis presented in Chapter 6.

3.4.1 Interrogatives

There are two ways of forming interrogatives in Rangi. The first of these strategies is used for polarity or *yes-no* questions and involves the placement of the question particle *úʉ* in the clause-final position and the use of interrogative intonation. The second strategy involves the use of a wh-phrases. The wh-phrases available in Rangi are *ani* 'who', *na nadi* 'when', *sa ché* 'why', *ché* 'what', *jooli* 'how' and *háyi* 'where' (see section 2.3.12). Both of these strategies are available for the formation of future interrogatives. However, whilst wh-interrogatives exhibit auxiliary-infinitive order, polarity questions exhibit infinitive-auxiliary order (the same order that is associated with declarative clauses).

Polarity questions are formed using the question particle *úʉ*, which appears clause-finally and is accompanied by interrogative intonation. The constituent order is the same as in an affirmative future declarative sentence (infinitive-auxiliary), as can be seen in examples (334)–(336).

(334) dóm-a mw-íise úʉ?
go-FV SM2nd pl-AUX Q
'Are you (pl) going?'

(335) hánd-a w-íise vi-ryo ʉ-hʉ mw-ááka úʉ?
plant-FV SM2nd sg-AUX 8-millet DEM-3 3-year Q
'Will you plant millet this year?'

(336) dáh-a ú-r~~ɨ~~ ~~u~~-h~~u~~ m~~u~~-remo ~~úu~~?
able-FV SM2ndsg-AUX DEM-3 3-work Q
'Will you be able to do this work?'

Yes-no interrogatives can also be formed without the question particle ~~úu~~, using the standard declarative word order but with the sentence marked as interrogative solely by way of intonation. This can be seen in examples (337) and (338) below.

(337) háánd-a u-r~~ɨ~~ ma-halaga?
plant-FV SM2ndsg-AUX 6-beans
'Will you plant beans?'

(338) dóm-a w-íise na gur-íi?
go-FV SM2ndsg-AUX CONN 9.market-LOC
'Will you go to the market?'

The auxiliary-infinitive order is also maintained in a polarity question when the future tense construction has a verbal complement. This can be seen in example (339) below.

(339) k~~u~~-dáh-a ú-r~~ɨ~~ k~~u~~-rut-a na ngururu ?
INF-able-FV SM2ndsg-AUX INF-pull-FV CONN 9.strength
'Will you be able to pull it with force?'

In contrast to polarity questions, future interrogative constructions which employ wh-expressions exhibit auxiliary-infinitive order. This can be seen in examples (340) and (341), which show future interrogatives formed with the question word *ani* 'who'.

(340) ani á-r~~ɨ~~ ful-a ingo j-á ingovi ?
who SM1-AUX wash-FV 10.clothes 10-of 9.celebration
'Who will wash the clothes for the celebration?'

(341) ani á-r~~ɨ~~ w~~u~~l-a ma-papai a-ya ?
who SM1-AUX buy-FV 6-papaya DEM-6
'Who will buy these papayas?'

The same auxiliary-infinitive order can be seen in examples (342) and (343) below, which show sentences employing the question pronoun *na nadi* 'when'. As in the

previous examples, with the question *na nadi* 'when', the inflected auxiliary appears in the position before the verb form, resulting in auxiliary-infinitive order.

(342) na nadi tú-r~~ɨ~~ pát-a my-eekenye?
when SM1st pl-AUX get-FV 4-sugar.cane
'When will we get sugarcane?'

(343) na nadi tú-r~~ɨ~~ k~~u~~-chw-a v~~ɨ~~-ryo?
when SM1st pl-AUX INF-harvest 8-millet
'When will we harvest millet?'

Examples (344) and (345) show that ungrammaticality results if a wh-question is formed using the infinitive-auxiliary order.

(344) *na nadi chw-a tu-r~~ɨ~~ v~~ɨ~~-ryo?
when harvest-FV SM1st pl-AUX 8-millet
'When will we harvest millet?'

(345) *na nadi k~~u u~~j-a á-r~~ɨ~~?
when INF-come-FV SM1-AUX
'When will you come?'

Use of the question word *jool~~ɨ~~* 'how' also results in future constructions in which the auxiliary-infinitive order is exhibited. This can be seen in example (346) where *jool~~ɨ~~* introduces a question and example (347) in which *jool~~ɨ~~* appears as part of a cleft construction.

(346) jool~~ɨ~~ tú-r~~ɨ~~ kw-ikal-a na ~~u~~-h~~u~~ m~~u u~~nt~~u~~?
how SM1st pl-AUX INF-stay-FV CONN DEM-1 1-person
'How will we live with this person?'

(347) n~~ɨ~~ jool~~ɨ~~ hasa á-r~~ɨ~~ dah-a ?
COP how really SM1-AUX able-FV
'How will s/he be able to…?'

This sub-section has shown that interrogatives which employ wh-expressions in both the immediate future tense and the general future, exhibit auxiliary-infinitive order. In contrast to this, polarity questions exhibit infinitive-auxiliary order. The fact that polarity and wh-questions do not pattern together indicates that it is not the interrogative nature of the clause that results in the auxiliary-infinitive order but the

type of interrogative. In Chapter 6 I propose that, specifically, it is the presence of the fronted wh-expressions which results in the auxiliary-infinitive order.

3.4.2 Sentential negation

Sentential negation, which is achieved through the use of the copula *sí* and the negative marker *~~tukʉ~~*, also exhibits auxiliary-infinitive order in the general future tense. The auxiliary-infinitive order associated with the negative general future tense can be seen in examples (348)–(350) below, where the inflected auxiliary regularly precedes the infinitival verb form in each instance.

(348) n~~iíni~~ sí ndí-r~~i~~ dóm-a na Kondoa t~~uku~~
1st sg.PP NEG SM1st sg-AUX go-FV CONN Kondoa NEG
'I will not go to Kondoa'

(349) ng'oombe sí jí-r~~i~~ k~~u~~-nyw-a maaji y-óósi voo t~~uku~~
10.cows NEG 10-AUX INF-drink-FV 6.water 6-all all NEG
'The cows will not drink all of the water'

(350) nkuku sí jí-r~~i~~ k~~u~~-tu-héer-a mayi t~~uku~~
10.chicken NEG 10-AUX INF-OM1st pl-give-FV 6.eggs NEG
'The chickens will not give us eggs'

The infinitive in negative general future constructions can also carry an object marker. This can be seen in example (350) above, where the verb *-heera* 'give' carries the first person plural object marker *tu-* and exhibits auxiliary-infinitive order.

In addition to the negation strategy outlined above, there are also two other ways to form negative general future tense constructions. One of these also employs the negative marker *sí* and the negative polarity item *~~tukʉ~~*. In this strategy the negative copula *sí* is prefixed onto the auxiliary *-r~~i~~* with the subject concord in turn being prefixed onto this negated auxiliary (see section 2.4.4 above). This can be seen in example (351) below.

(351) tu-si-r~~i~~ sínj-a mb~~ú~~rí t~~uku~~
SM1st p-NEG-AUX slaughter-FV 9.goat NEG
'We will not slaughter the goat'

As can be seen on examination of the example above, the first person plural prefix *tu-* is prefixed onto the negative prefix *si-*, with both of these prefixes hosted by the auxiliary *-rɨ*. The inflected auxiliary *tusirɨ* precedes the infinitival verb form *sinja* 'slaughter', representing an auxiliary-infinitive order. The negative particle *tʉkʉ* again appears in the clause-final position.

The third negation strategy used in the general future tense employs only the negative marker *tʉkʉ* which appears clause-finally. Significantly, this strategy exhibits infinitive-auxiliary order but is distinguished from affirmative general future constructions by the presence of the negative marker *tʉkʉ*. This is exemplified in (352) below.

(352)	sínj-a	tú-rɨ	mbʉ́ri	tʉkʉ
	slaughter-FV	SM1st pl-AUX	9.goat	NEG
	'We will not slaughter the goat'			

In example (352) above the infinitive-auxiliary order can be seen in the form *sinja turɨ* 'we will slaughter', which is followed by the object with the negative marker *tʉkʉ* appearing clause-finally.[44]

This section has shown that negative future tense constructions that are formed using the *sí...tʉkʉ* negation strategy exhibit auxiliary-infinitive order despite their future tense interpretation. The same can be seen in sentential negation, which is achieved using the negative prefix *si-* in and the auxiliary *-rɨ* which results in the infinitive-auxiliary order. This contrasts however, with the future tense negation which is achieved solely through the addition of the negative marker *tʉkʉ*. Section 3.4.3 discusses future tense relative clauses which also exhibit auxiliary-infinitive order.

3.4.3 Relative clauses

Relative clause constructions in Rangi are formed through the use of the relative pronoun *-eene.* The auxiliary-infinitive order found in future tense relative clauses can be seen in example (353). It is also possible for the relative pronoun *-eene* to be

[44] In this example the beginning of this verb is not the negative marker *sí* but rather part of the lexical root of the verb is *-sinja* 'slaughter'.

omitted from a relative clause construction, as can be seen in examples (354) and (355) below. The auxiliary-infinitive order is found in both instances.

(353) k~~u-u~~ntu kw-eene nd~~í-ri~~ dóm-a (Oliver Stegen p.c.)
16-place 16-REL SM1st sg-AUX go-FV
'The place where i will go'

(354) mw-aarimu a-ri lok-a a-boh-a
1-teacher SM1-AUX leave-FV SM1-be.good-FV
'The teacher who is going to leave is good'

(355) m~~u~~-lay-~~i~~r-a ha-ant~~u~~ á-ri rím-a isik~~u~~
OM1-show-CAUS-APPL-FV 16-place SM1-AUX farm-FV 9.today
'Show him/her the place where s/he will farm today'

Example (353) above shows a noun phrase in which the head noun *k~~uu~~ntu* 'place' is modified by the relative clause *kweene nd~~ír~~i dóma* 'that I will go (to)' which is introduced by the relative pronoun. In contrast, examples (354) and (355) show relative clauses that are not introduced by the relative pronoun *-eene*. In all three instances however, the future construction that comprises the relativised element exhibits the auxiliary-infinitive order.

The next section presents examples of Rangi future tense cleft constructions. Cleft constructions are also associated with the auxiliary-infinitive order in the future tense. This is shown in section 3.4.4 below.

3.4.4 Cleft constructions

A constituent in a sentence can be focused by way of a cleft construction. These are typically formed in Rangi through the use of the copula *n~~í~~*. This results in a focus interpretation and the auxiliary-infinitive order, as can be seen in examples (356) and (357) below.

(356) n~~í~~ na l~~u-u~~l-wíi nd~~í-ri~~ dóm-a noó tem-a
COP CONN 11-moutain-LOC SM1st sg-AUX go-FV COP chop-FV
inkwi
9.firewood
'It is to the mountain I am going in order to chop firewood'

(357) n~~í~~ na basi nd~~í~~-r~~ɨ~~ dóm-a na Dodoma
COP CONN 9.bus SM1st sg-AUX go-FV CONN Dodoma
'It is by bus that I'm going to Dodoma'

The auxiliary-infinitive order can be seen to contrast with the non-cleft future constructions shown in example (358), which are rendered ungrammatical if they are associated with the auxiliary-infinitive order.

(358) *nd~~í~~-r~~ɨ~~ dom-a na l~~u~~-~~u~~l-wíi noó kwaat-a namaha
SM1st sg-AUX go-FV CONN 11-mountain-LOC COP catch-FV 10.termites
Intended: 'I will go to the mountains to catch termites'

Cleft constructions in which the future tense construction has a verbal complement also exhibit auxiliary-infinitive order. This can be seen in (359) below where the auxiliary-infinitive order is followed by the verbal complement *k~~u~~valoongera* 'to listen to them'.

(359) M~~u~~-dala Asha noó á-r~~ɨ~~ dah-a k~~u~~-va-loong-er-a
1-old.woman Asha COP SM1-AUX able-FV INF-OM2-listen-APPL-FV
i-sáare r-áányu ~~ɨ~~-r~~ɨ~~
5-word 5-your DEM-5
'Old woman Asha will indeed be able to listen to your words'

Cleft constructions can therefore be seen to be another context in which the future tense constructions exhibit the auxiliary-infinitive order. The next section examines subordinate clauses, the last of the 'alternation contexts' which is under examination here. As will be shown in section 3.4.5, subordinate clauses also exhibit the auxiliary-infinitive order in the future tense.

3.4.5 Subordinate clauses

Clauses introduced by the subordinators *kooni* 'if', *vyeene* 'the way' and *jool~~ɨ~~* 'how' also exhibit the auxiliary-infinitive order in the future tense. The use of *kooni* 'if' can be seen in examples (360) and (361) below, where the inflected auxiliary *-r~~ɨ~~* precedes the infinitive in both examples.

(360) sí ndí-rɨ dáh-a kʉ-taang-a koóni á-rɨ
NEG SM1st sg-AUX able-FV INF-know-FV if SM1-AUX
kʉ-ʉj-a lamʉtoóndo
INF-come-FV 9.tomorrow
'I will not be able to know if s/he will come tomorrow'

(361) kʉ-ʉ́j-a á-rɨ koóni á-rɨ joo reet-a chá-kʉrya
INF-come-FV SM1-AUX if SM1-AUX DIR bring-FV 7-food
'S/he will come if s/he brings food'

As can also be seen on examination of example (361) above, the deictic particle *joo* appears before the infinitive (and after the inflected auxiliary *-rɨ*) in this auxiliary-infinitive order (cf. example (366) below, where *joo* appears clause-initially – in front of both the infinitive and the auxiliary).

The auxiliary-infinitive order is only found in the clause introduced by the subordinator. In instances in which a future tense construction is present in part of the utterance which is not the subordinate clause introduced by *kooni*, infinitive-auxiliary order is retained, as can be seen in examples (362)–(364).

(362) koóni w-óó-rínd-ɨr-ɨr-a cherev-a ú-rɨ
if SM2nd sg-PROG-wait-APPL-APPL-FV late-FV SM2nd sg-AUX
'If you wait you will be late'

(363) mbʉla koóni y-a-lóók-ire mw-aasʉ vár-ɨk-a ú-rɨ
9.rain if SM9-PAST-leave-PTV 3-sun shine-STAT-FV SM2nd sg-AUX
'If the rain goes away the sun will shine'

(364) koóni n-a-pát-ire mbeyu j-á ma-taanga koo
if SM1st sg-PAST-get-PTV 10.seeds 10-of 6-pumpkin DIR
hand-a ndí-rɨ
plant-FV SM1st sg-AUX
'If I get pumpkin seeds I will plant them'

The auxiliary-infinitive order is also found when the subordinator *joolɨ* 'how, the way' is used to introduce a subordinate clause comprising a future. This can be seen in example (365) below.

(365) n-íyó-wás-a jool~~ɨ~~ nd~~ɨ~~-r~~ɨ~~ r~~ɨ~~h-a ada
SM1st sg-PROG-think-FV how SM1st sg-AUX pay-FV 10.fees
'I am thinking about how I will pay the fees'

The subordinator *vyeene* 'the way, how' is also used to introduce modal clauses. The use of *vyeene* alongside a future utterance also results in auxiliary-infinitive order, as in example (366) below.

(366) joo ku-wír-a nd~~ɨ~~-r~~ɨ~~ vyeene ú-r~~ɨ~~ r~~ɨ~~m-a
DIR OM2nd sg-tell-FV SM1st sg-AUX how SM2nd sg-AUX farm-FV
~~u~~-h~~u~~ mw-ááka
3-DEM 3-year
'I will show you how you will farm this year'

As can be seen in example (366) above, the deictic particle *joo* appears before the infinitive. This is consistent with the placement of *joo* in example (361) above, where it appears before the infinitival verb form in the relative clause, even when the auxiliary-infinitive order is found. As can be seen on comparison of these examples, the deictic particles *joo* and *koo* (when present) consistently appear before the verb form regardless of the positioning of this verb form. For more on the deictic particles see section 2.4.3.

Subordinate clauses introduced by *kooni* 'if', *vyeene* 'the way' and *jool~~ɨ~~* 'how' all exhibit the auxiliary-infinitive order in the future tense provided that the future tense constructions are the complement which is being introduced by one of these words. Subordinate clauses therefore form part of the set of conditions in which the auxiliary-infinitive order is found.

To summarise, basic affirmative declarative clauses in both the immediate future tense and the general future tense exhibit infinitive-auxiliary order. However, wh-interrogatives, sentential *sí...t~~u~~k~~u~~* negation, cleft constructions, relative clauses and complement clauses all exhibit auxiliary-infinitive order in the future tenses. I refer to the set of syntactic contexts in which the auxiliary-infinitive order is found as the

'alternation contexts'. The formal modelling of these constructions and the auxiliary-infinitive order they exhibit is the focus of Chapter 6.

In the case of interrogatives, it is only those formed with wh-expressions which exhibit auxiliary-infinitive, whilst polarity questions formed either with or without the question particle *ʉʉ*, exhibit infinitive-auxiliary order. There also exists variation with the context of negation. Sentential negation which is achieved through the use of the negative copula *sí* or the negative inflected auxiliary *-rɨ*, in conjunction with the negative marker *tʉkʉ*, results in auxiliary-infinitive order. In contrast to this, sentences which are negated by the presence of *tʉkʉ* alone exhibit infinitive-auxiliary order. Relative clauses which are formed using the relative pronoun *-eene* and those which do not employ the pronominal strategy also exhibit auxiliary-infinitive order. Clauses which are introduced by the subordinators *vyeene* 'the way', *joolɨ* 'how' *and koóni* 'if, when' also form part of the alternation contexts, exhibiting auxiliary-infinitive order. The ordering of the auxiliary with regard to the infinitive and the syntactic conditioning of this distribution is shown in Table 19 below.

Table 19: Ordering of infinitive and auxiliary in future tense constructions

Infinitive-auxiliary order	**Auxiliary-infinitive order**
Affirmative Declarative	
Polarity question	Wh-question
	Cleft constructions
Main clause	Relative clause Subordinate clause
tʉkʉ negation	Sentential *sí…tʉkʉ* negation

3.5 Summary

This chapter has presented an overview of the function and interpretation associated with the copulas and auxiliaries found in Rangi. It has also provided an in-depth

examination of the infinitive-auxiliary construction and the syntactic factors affecting its distribution. The copula *nɨ* has a basic predicative use where it functions to link a subject with a predicate. The copula *nɨ* is also used to introduce the optional agent by-phrase in passive constructions, and can be used in the construction of clause-initial clefts. A possible derivation of *nɨ* is the form of *noó*, which is used to link a verbal predicate with a purpose and which is used in reporting someone's name. The simple copula *nɨ* has a negative counterpart *sí*, which is used as a simple copula in negative clauses, as well as forming part of the strategy for sentential negation. In both instances it appears alongside the negation marker *tɨkɨ*. The multifunctional auxiliary *-rɨ* functions as a predicative base. Historically, it appears to have formed part of the locational construction based on *-mwaarɨ* and the irrealis construction formed using *-kaarɨ.* The auxiliary *-rɨ* is also used in the formation of two compound constructions, encoding the distant past perfective and the general future tense.

The past tense auxiliary *-íja* is used in the distant past tense and appears as part of a complex construction in the distant past habitual and the distant past perfective. The auxiliary *-vá* is also commonly associated with the meaning 'to be' although its use with the consecutive marker *ka-* typically encodes a meaning closely associated with 'to become'. When used with the habitual suffix *-á-*, the auxiliary *-vá* is used in the formulaic introduction of narratives where it exhibits the allomorph *-vija*. The immediate future auxiliary *-íise* appears only in the immediate future tense, which is formed through a compound construction involving an infinitival verb form and the auxiliary *-íise*. The immediate future auxiliary *-íise* regularly participates in the infinitive-auxiliary construction which is analysed in Chapter 5.The possessive auxiliary *-tɨite* is used as a possessive copula to link two nominal predicates where one has 'ownership' of or possesses the other.

The second half of this chapter presented the infinitive-auxiliary order which is associated with the future tenses in Rangi and which is the focus of the current thesis. Data were provided exemplifying this marked order and the contexts in which

it appears. It was shown that the future tense is formed using an infinitival verb form which optionally hosts the class 15 prefix *ku-*. The infinitive can also carry an object marker. Whilst the general future tense is formed using the auxiliary *-ri*, the immediate future tense is formed using the auxiliary *-íise*. The chapter then went on to outline the restricted syntactic contexts in which the future tense is associated with auxiliary-infinitive order. These contexts, known as the 'alternation contexts', include wh-questions, sentential *sí…tukú* negation, complement and relative clauses, and cleft constructions. Data were presented exemplifying these constructions with the aim of laying the foundation for the formal analysis of these alternation contexts which is found in Chapter 6.

The next chapter provides an introduction to Dynamic Syntax – the framework which will be used for the formal characterisation of the Rangi auxiliary constructions. Chapter 4 lays out the concepts that are central to Dynamic Syntax as well as providing an overview of the tools and mechanisms made available by the framework. It presents a discussion of Dynamic Syntax modelling of clause structure in Bantu languages, including Rangi. This will provide the foundation for the formal analysis which comprises the focus of Chapters 5 and 6.

4 The Dynamic Syntax framework

4.1 Introduction

With Chapters 2 and 3 having provided a grammatical sketch of Rangi and an introduction to auxiliary placement in particular, the current chapter introduces Dynamic Syntax (Kempson et al. 2001; Cann et al. 2005b). Dynamic Syntax (DS) is the theoretical framework which is used for the formal analyses of Rangi auxiliary constructions presented in this thesis. Chapter 4 is divided into two sections. The first section presents the tools and formal mechanisms of representation employed in the DS framework. The second half of this chapter presents specific issues involved in DS modelling of Bantu languages. The assumptions that are adopted for modelling Rangi clause structure, and the motivation behind them, are also laid out. The aim of this chapter is therefore to provide an introduction to the DS system, which are necessary for the development of the analyses of Rangi clause structure, particularly the infinitive-auxiliary constructions which comprise the focus of Chapters 5 and 6.

4.2 The framework

Dynamic syntax (DS) is a formal model of utterance description which tries to articulate and substantiate the claim that human knowledge of language is essentially the ability to parse spoken language in context. DS is concerned with the ability of the hearer to construct semantic representations from words in the order in which they are encountered. The representation of this process is the primary task for DS syntactic analysis. From the perspective of DS, syntactic knowledge is the ability and associated requisite knowledge to successfully parse well-formed combinations of words. Context is also central to interpretation in DS, and strings of words are interpreted and enriched by the context against which they are presented. DS aims to formally express speakers' knowledge by modelling their competence. The goal in so doing is the provision a formal model of how speakers build semantic representations from lexical and contextual information. The primary conceptual claim on which the framework is based is that linguistic knowledge is intimately

related to the human ability to parse information and to construct semantic representations from underspecified input.

Dynamic Syntax provides a model of the way hearers incrementally build semantic representation (and subsequent interpretation) from the information provided by words in context. Semantic trees are used to represent this construction of meaning and are the only level of representation adopted by the framework.[45] Semantic trees represent a possible interpretation of a string of natural language, whilst syntax is considered to be the incremental growth of semantic trees in the parsing/production process. Tree growth is the unfolding of one partial tree from another in which the relations holding within the trees are progressively specified. A key characteristic of Dynamic Syntax is therefore that it is not just the final tree which is important, but also the transitional steps that are taken to get from one partial semantic tree to another. As such, the steps by which the final output is reached are deemed to be as important as the output itself (Cann et al. 2005b:21).

Dynamic Syntax makes a variety of processing strategies available. For any one natural language string, a variety of strategies for the establishment of semantic content may be available. The set of parsing strategies employed make little or no difference to the content associated with the distinct output structures. However, the processes chosen along the way can be used to reflect word order or pragmatic interaction of the concept(s) with the context. These steps, and the tree growth they represent, are licensed through a combination of lexical actions (which are triggered by the parsing of words or morphemes encoding structured lexical entries), computational rules and pragmatic actions.

4.3 Tools of the framework

Dynamic Syntax represents the parsing/production process through the incremental growth of binary semantic trees. The growth of information accumulated during the interpretation process is modelled as the growth of semantic trees, which represent

[45] This differs from other theoretical approaches such as Lexical Functional Grammar (LFG) and Minimalism, in which multiple levels of representation are used.

logical forms. The information in the trees is updated after each word or morpheme is parsed. Dynamic Syntax derivations therefore show transitions from a minimal tree (which is always the starting point) through a series of partial trees until a complete tree is formed. The final complete tree represents some propositional formula from which the hearer can interpret the utterance. The minimal initial tree of any DS derivation is introduced by a rule known as the AXIOM and is of the form shown in (367) below.

(367) The AXIOM

Tn(0), ?Ty(t)

This minimal tree is a single node labeled with the tree node address 0 (or Tn(0)). This address indicates that it is the root node of the proposition to be established. The presence of the question mark (?) shows that there is a requirement at this node. As will be shown in this chapter, requirements are an integral element of the DS framework. All requirements must be satisfied before the derivation is complete. The requirement at the AXIOM is the establishment of a proposition. A proposition is represented by the semantic type *t* (or Ty(t)) – where *t* stands for 'truth evaluable'– and the requirement for a proposition is represented by ?Ty(t). The overall goal of any DS derivation is therefore the establishment of some propositional formula Ty(t), which represents a possible interpretation of a string of language. This initial stage of the derivation reflects the intuition that hearers expect speakers to communicate some meaningful content – a proposition. Hearers in turn use these propositions to derive pragmatic inferences in order to establish (a representation of) the assumed speaker's meaning.

The steps of the parsing process are represented by the growth of binary trees which are decorated with information about the tree node in question. Binary trees do not encode word order but rather show argument structure. By convention, nodes on the left of the tree correspond to argument nodes whilst nodes on the right of the tree correspond to functor nodes. However, word order can be traced by examining the intermediary steps of the parsing process. One partial tree is developed into another

as the result of lexical actions which are encoded in lexical input and through syntactic transition rules. For example, in the trees in (368) below, the transition rules of INTRODUCTION and PREDICTION (discussed in section 4.7) enable the transition from the AXIOM to a tree with a functor node and a predicate node.

(368) Tn(0), ?Ty(t), ◊ ⟶ Tn(0), ?Ty(t)

?Ty(e) ?Ty(e→t), ◊

Tree nodes in DS are assumed to be inhabited by abstract representations rather than by words themselves. As such, formula values representing semantic expressions and concepts, as well as information about the node in question, decorate tree nodes. Every node is assumed to have a formula value (Fo). Formula values represent semantic expressions (or concepts) and are of the form Fo(X). Thus, a verb such as 'arrive' has the formula value Fo(arrive').[46] A tree node description comprises all the information annotating (and thereby holding at) a tree node (Cann et al. 2005b:36). Tree nodes also carry information on the semantic type of the formula value. Every node carries a type (Ty) value, where Ty refers to the semantic type of the word in question. The adoption of the *e*, *t* notation follows the terminology widely used in formal semantics (Dowty 1981; Cann 1994; Heim and Kratzer 1997). DS makes use of a closed set of types – *e, t* and *cn* (common noun) – and a set of functor types which are made up of these basic types. These types represent the semantic category of expressions. The type of an expression is determined in its lexical entry. Table 20 below shows the types employed in DS.

[46] The prime (') is used to denote that the concept, not the word itself, is used.

Table 20: Types used in Dynamic Syntax

Type	Use
Ty(e)	Individual term (entity)
Ty(t)	Proposition
Ty(e→t)	One-place predicate
Ty(e→(e→t))	Two-place predicate
Ty(e→(e→(e→t)))	Three-place predicate
Ty(cn)	Nominal
Ty(cn→e)	Quantifier

Tree node addresses are used to locate a particular node within a tree. They are of the form Tn(x), where Tn stands for tree node and *x* ranges over possible tree node addresses. The initial (or root) node in a tree has the specific address Tn(0). Alternatively a tree node can have an arbitrary value such as Tn(a). Whilst Fo, Ty and Tn all have different functions as tree node decorations, these decorations are unified by the fact that they are all obligatorily present at any node.

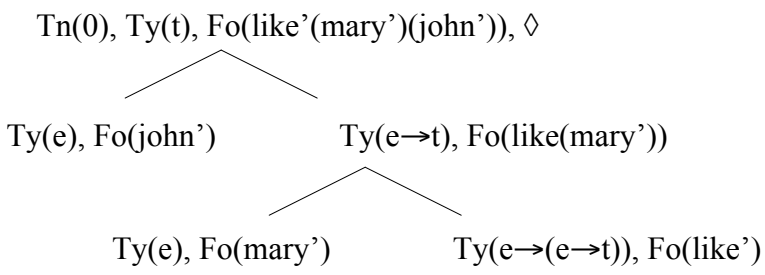
4.4 Requirements

The growth of information during the interpretation process is represented by the incremental growth of binary semantic trees. The parsing process is considered to be a goal-driven process, with tree growth occurring incrementally via the satisfaction of a series of requirements. Requirements can be seen as descriptions which do not hold at a given node but must do so at some point in order for the parsing process to be successful. They are represented through the use of the question mark (?). Thus, ?Ty(t) represents the requirement for the construction of some formula with the label Ty(t), i.e. a proposition. Tree growth is achieved through the fulfillment of requirements which can be considered as sub-goals, all of which culminate in the establishment of the type *t* propositional goal.

Since parsing and production take place on an incremental basis, requirements can be left outstanding at any of the intermediate stages in the processes. However, at the end of the parsing process, no requirements can be left unfulfilled. It is the satisfaction of requirements that determines the well-formedness of a completed structure since a well-formed tree, representing the result of successfully parsing a natural language string, must contain no outstanding requirements. In this sense,

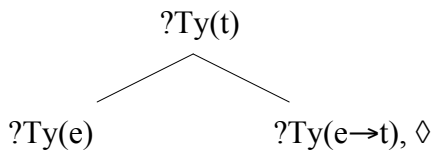
requirements can also be used to account for ungrammaticality. Given the dynamic nature of the framework however, grammaticality is determined by the set of transitions involved in a parse, not by the final tree alone. A completed tree showing no outstanding requirements can be seen in (369) below.

(369) Parsing: John likes Mary



Given the dynamic nature of the DS system and the fact that information is established incrementally by way of multiple updates of partial trees, a device known as the pointer (◊) is used to track the node under construction at any point in the parsing process. Pointer movement is achieved by lexical and computational actions.

(370) Tree showing the Pointer



In the tree in (370) above, the presence of the pointer (◊) indicates that the ?Ty(e→t) node is under construction. The update of information in a tree can only be achieved at the node on which the pointer is present. A consequence of the pointer is that update cannot be carried out on more than one node at the same time.

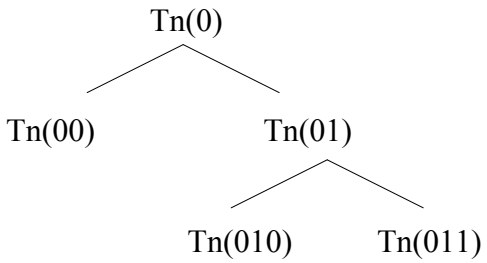
4.5 Language of representation: The Logic of Finite Trees

When describing the position of a node within a tree, dominance relation terms are used. The terms 'daughter', 'mother', 'dominance' and 'immediate dominance' can

be used to refer to the relations that hold between nodes within a tree. More formally however, Dynamic Syntax employs the language of the *Logic of Finite Trees* (LOFT) (Blackburn and Meyer-Viol 1994; Kempson et al. 2001) to describe the relations that hold between tree nodes. Two basic LOFT modal operators are used; the operator ↓ describes the daughter relation, and the operator ↑ describes the mother relation. By convention, arguments are represented on the nodes on the left and are labelled 0, whilst functor nodes are represented by the nodes on the right and are labelled 1. The combination of the 1 and 0 and the ↓ and ↑ modalities can be used to describe precise relations that hold between nodes. Thus, $\downarrow_0$ is used for an argument daughter, whilst $\downarrow_1$ is used for a functor daughter.

The tree node address label *Tn* enables the identification of the exact location of a tree node with respect to the root node. Tree node addresses can be used to describe how to move from one tree node to another as well as identifying particular locations within a tree. The root node is the only node which is not dominated by any other node. Since the tree node address of the root node is Tn(0), the addresses of its two daughter nodes are Tn(00) which indicates a daughter argument node, and Tn(01) which indicates a daughter functor node. This, and other tree node addresses can be seen in the sample tree in (371) below.[47]

(371) Tree showing tree node addresses

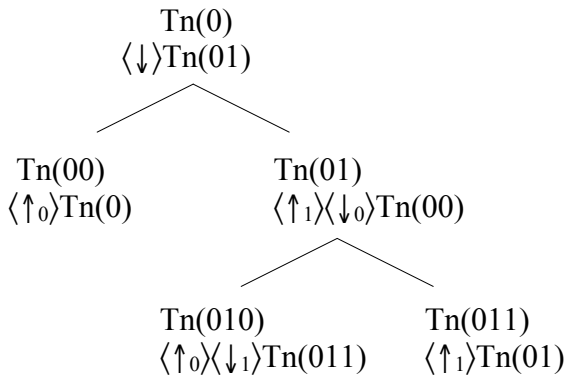


The ↓ and ↑ modalities have both existential and universal use. To distinguish between these two uses, angled (⟨...⟩) and square ([…]) brackets are employed. A

[47] In the interest of space and clarity, the addresses of all tree nodes are not shown in subsequent trees.

tree modality inside angled brackets contains an existential statement such as $\langle\downarrow\rangle$, which means 'there is a daughter node'. The same modality inside square brackets – $[\downarrow]$ – involves a universal statement such as 'for all nodes found if you go down the daughter relation'. These modalities can also be further specified or underspecified. A given tree modality might further specify the daughter node it is referring to by representing it as $\langle\downarrow_0\rangle$ or $\langle\downarrow_1\rangle$. A tree showing a selection of LOFT modalities and the specific tree node addresses is shown in (372) below.

(372) Tree showing LOFT modalities and tree node address



LOFT modalities can also be combined recursively to show non-immediate dominance relations. In this way, the granddaughter relation can be captured via recursive use of the mother relation, i.e. $\langle\downarrow\rangle\langle\downarrow\rangle$. A grandmother relation can also be expressed via recursive use of the daughter relation, i.e. $\langle\uparrow\rangle\langle\uparrow\rangle$.

A distinction is further made between terminal and non-terminal tree nodes. The universal and the down arrow modal operators are used in conjunction with the *falsum* sign for the so-called bottom restriction. The bottom restriction ($[\downarrow]\bot$) is used to identify terminal nodes and means; 'for all nodes immediately dominated by this node, the *falsum* holds'.[48] This means that the current node cannot have any daughters, indicating that the current node is a terminal node. The opposite of the

[48] The bottom restriction is part of all lexical entries of full content words which inhabit terminal nodes. However, in the interest of clarity, I do not show the bottom restriction in tree displays unless its presence is central to the analysis under discussion.

falsum is the *verum* ([↓]⊤) which means that there must be nodes below the current node.

The LOFT system also allows for the expression of underspecified dominance relations where the exact dominance relation is not yet known. This unknown, underspecified relation is captured by reference to either the Kleene star (*), which expresses the general notion of dominance plus reflexivity, or the Kleene plus (+) which does not include an empty set meaning that the node in question can be any node apart from the current node. Thus, the modality ⟨↓*⟩ means: if you go down zero or more steps across the daughter relation, there is a node. This node can therefore be any node below the current node or the current node itself since the number of steps can also be zero. In contrast to this, the Kleene + operator does not include the zero step which means that you progress at least one. The modality $\langle\downarrow^{+}\rangle$ therefore means: if you go down one or more steps across the daughter relation, there is a node. The Kleene star (*) can be used in combination with the up and down arrows. This can be used as a means for expressing that a decoration X holds at some dominating node above the current node without providing the exact location of the node in question. This would therefore be represented as ↑* X. These annotations can be used whenever the exact location in a tree of some description is unknown, despite the tree relations themselves having been fully specified. Further application of the Kleene-star and the Kleene-plus operations are show in section 4.6 below.

4.6 Underspecification

In addition to being concerned with the interpretation that is projected by an utterance, Dynamic Syntax considers how a proposition is established on the basis of its component parts. Underspecification is a central concept within the framework and is considered to be the property of natural language that allows the introduction and manipulation of incomplete information at any (and every) stage in the production/parsing process. DS models the on-line processing of natural language input. Once information is encountered it must be used and cannot be changed or cancelled at a later stage. However, underspecification refers to the use of lexical

information, which is not sufficient to determine its full semantic interpretation or final structural position. In such instances, the information that is available is used. However, the underspecified information carries with it a requirement for the provision of fully specified information before the parse is complete. The resolution of underspecification is therefore another mechanism which drives the derivation forward.

In the establishment of binary semantic trees, Dynamic Syntax licenses the construction of:

i) fixed nodes
ii) unfixed nodes
iii) LINK structures

Fixed nodes, as their name suggests, have a fixed tree node address within the tree. In contrast to fixed nodes, unfixed nodes are not associated with any fixed position within the tree and have a temporary unfixed tree node address, the position of which is updated at a later stage in the parse. Unfixed nodes are used to represent structural underspecification. The LOFT language used to represent this underspecified information employs Kleene stars. Thus, $\langle\downarrow^{*}\rangle$ is used to indicate that there may be another node somewhere below the current node, whilst $\langle\downarrow^{*}{}_{1}\rangle$ means that only functor daughters are eligible candidates for the eventual location. Unfixed nodes can be interpreted either locally or non-locally, the difference also being represented through different modalities associated with these nodes. The third type of structure found in Dynamic Syntax is the LINK STRUCTURE. LINK structures are used to connect two trees which are constructed in parallel and that crucially, share some common semantic content. The ADJUNCTION rules are a set of computational rules that introduce unfixed nodes and LINK structures. These are discussed in further detail in section 4.7.

Metavariables are also used to represent underspecification. Metavariables act as content placeholders and do not represent any logical formula but rather stand as a site in to which a formula value may be substituted. As such, metavariables must be

updated to a full formula value at some point during the parsing process and crucially, before the derivation is complete. This is achieved by positing a requirement for a full value of the predicate to be found on the same node as the metavariable. This requirement is encoded in the form of the existential statement ?∃x.Fo(x) in case of a formula metavariable, or ?∃x.Ty(x) in the case of a type metavariable. These statements therefore read: 'there is a requirement that a proper Fo/Ty value is found in the tree node'. Metavariables which are not substituted as required can therefore lead to ungrammaticality. Metavariables are represented by boldface capitals, e.g. Fo(**U**).

Metavariables can carry restrictions which further constrain the domain of potential substituents. When parsing a Swahili subject marker for example, the subject marker projects a metavariable as the formula value given by its lexical actions. However, the interpretation of the subject marker is restricted by the class information that the subject marker encodes. This limitation can be represented through the use of a restricted metavariable which reflects the fact that update to a formula value of an incompatible noun class would result in ungrammaticality. This can be seen in (373) below, where the potential substituents for the metavariable **U** on the unfixed node are restricted to class 10 referents.

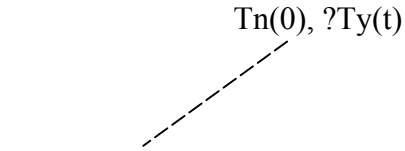
(373) Parsing: *zi-*

Tn(0), ?Ty(t)

Ty(e), Fo($\mathbf{U}_{\text{CLASS10}}$),
?∃x.Fo(x), ◊

The update to a full formula value is a pragmatically-driven process by which a lexically provided metavariable is enriched with a term that has been established through context. Therefore the metavariable Fo($\mathbf{U}_{\text{CLASS10}}$) can appropriately be substituted by the class 10 noun *nyuki* 'bees', as can be seen in the tree in (374) below.

(374) Parsing: *zi-*



4.7 Computational rules as a mechanism of tree growth

Tree growth in Dynamic Syntax takes place in one of two ways; either through computational rules or through lexical rules. Computational rules are the basic mechanism by which semantic trees are constructed. They enable the development of one partial tree description into another partial tree description and are represented formally through an input and an output description. The input description includes information about where the pointer must be whilst the output description shows the transformation of the input in terms of requirements, the addition of nodes, pointer movement etc. The format of computational rules, following Cann et al. (2005b:42), is shown in (375) below.

(375) Computational rule format

$$\frac{\text{Input Tree Description}}{\text{Output Tree Description}}$$

The transitions rules can therefore be read to mean: if the input tree description holds, then the output tree description can be the result.

Computational rules are assumed to be a closed set of rules. Whilst these rules were assumed to be universally and uniformly available, studies of a wider range of languages within the DS framework have brought this claim into question. Bouzouita (2008b) for example, claims that the rules of INTRODUCTION and PREDICTION do not apply for Medieval Spanish although earlier analyses have been based on the availability of these rules for English (see Kempson et al. (2001) and Cann et al. (2005b)). Since the computational rules are assumed to be universally and uniformly available, Bouzouita's (2008b) claim that INTRODUCTION and

PREDICTION are not available in Medieval Spanish must be considered to bring into question the availability of these rules in DS.[49]

4.7.1 INTRODUCTION

The starting point of all parsing processes is the requirement to derive a proposition. Given this starting point, the parsing process begins with a tree containing only one node which encodes the requirement to obtain a type *t* formula. Once a partial tree with a ?Ty(t) requirement has been introduced, the rule of INTRODUCTION (as defined by Kempson et al. (2001); Marten (2002); Cann et al. (2005b)) can divide the main goal into two sub-goals. The rule of INTRODUCTION is defined as in (376) below.

(376) The rule of INTRODUCTION

$$\frac{\{\ldots\{?Tn(n), ?Ty(t)\ldots, \Diamond\}\}}{\{\ldots\{?Tn(n), ?Ty(t), ?\langle\downarrow_0\rangle Ty(e), ?\langle\downarrow_1\rangle ?Ty(e\rightarrow t)\ldots, \Diamond\}\}}$$

Given that a node carries a type requirement, INTRODUCTION can be seen as a rule which introduces two new type requirements. From the AXIOM, the requirement for a Ty(t) expression can be developed into the requirement for two daughters. The use of ellipsis (…) has two possible functions in the context of the computational rules. When it is found within a node carrying other kinds of information (e.g. {…, Fo(a),…}) it indicates that other information might be present before and after the presented information. However, if the ellipsis appears in a node containing only the ellipsis and precedes or follows another node ({… {Fo(a)}…}), it indicates that other nodes might precede or follow the node containing the Fo(a) decoration. The effect of the rule of INTRODUCTION is the tree shown in (377) below.

(377) The effect of INTRODUCTION

[49] I assume that the rules of INTRODUCTION and PREDICTION do not apply for Rangi. However, I do not propose that the availability of computational rules should be parameterised and, as such, I would consequently propose that they are not available cross-linguistically.

$$?Ty(t), ?\langle\downarrow_0\rangle Ty(e), ?\langle\downarrow_1\rangle Ty(e\rightarrow t), \Diamond$$

As can be seen on examination of the rule of INTRODUCTION, the output of the rule also consists of only one tree node. This means that whilst the rule of INTRODUCTION adds daughter requirements to the tree, it does not build these daughter nodes. The construction of these daughter nodes is carried out by the rule of PREDICTION.

4.7.2 PREDICTION

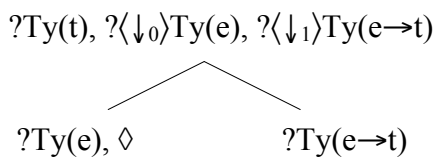
The rule of PREDICTION builds the two daughter nodes, decorates them with the two sub-requirements and leaves the pointer at the argument daughter node. The rule of PREDICTION, as stated in Cann et al. (2005b:44), can occur only at the subject and predicate node. The rule is shown in (378) below.

(378) The rule of PREDICTION – subject and predicate

$$\frac{\{\ldots\{Tn(0), ?\langle\downarrow_0\rangle Ty(e), ?\langle\downarrow_1\rangle Ty(e\rightarrow t), \Diamond\}\}}{\{\ldots\{Tn(0), ?\langle\downarrow_0\rangle Ty(e), ?\langle\downarrow_1\rangle Ty(e\rightarrow t)\}, \{\langle\uparrow_0\rangle Tn(0), ?Ty(e), \Diamond\}, \{\langle\uparrow_1\rangle Tn(0), ?Ty(e\rightarrow t\}\}}$$

The PREDICTION rule can therefore introduce the subject node and the predicate node, resulting in a partial tree which has three nodes: the top node annotated with ?Ty(t), an argument node annotated with ?Ty(e) and a predicate node annotated with ?Ty(e→t). The effect of the application of the PREDICTION rule can be seen in (379) below.

(379) The effect of PREDICTION



As defined above, these rules can only apply in a situation in which no other nodes exist within the tree. However, this characterisation of the rule applies only in a language with a strict SVO word order, where parsing of the subject always occurs

before the verb or the object. Bouzouita (2008b) claims that for Spanish the rules of INTRODUCTION and PREDICTION do not apply. This claim is based on the fact that Spanish is a subject pro-drop language, and as such the lexical specifications of the verb alone are sufficient for the construction of the subject-predicate template. I also propose that the rules of INTRODUCTION and PREDICTION are not available in Rangi (see section 4.9.3). The rules of INTRODUCTION and PREDICTION differ from the other computational rules in that these rules are concerned with the unfolding tree structure whilst the other rules act on the values of the tree nodes instead of expanding the tree structure.

4.7.3 THINNING

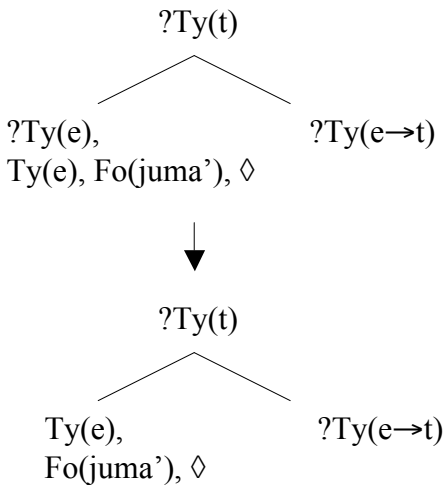
All requirements must be satisfied by the time the parse is complete in order for the parse to be successful. Once requirements are satisfied, they are eliminated by the rule of THINNING. Given a node carrying both a requirement for a value and the value itself, the rule of THINNING eliminates the requirement. This can be seen on examination of the formalisation of the rule in (380) below.

(380) The rule of THINNING

$$\frac{\{\ldots\{\ldots, X, \ldots, ?X, \ldots, \Diamond\}\ldots\}}{\{\ldots\{\ldots, X, \ldots, \Diamond\}\ldots\}}$$

The effect of the rule of THINNING is therefore to eliminate requirements that have been satisfied. The effect of THINNING can be seen in the trees in (381) below.

(381)



As the trees above demonstrate, the rule of THINNING removes the requirement ?Ty(e) at the subject node since the requirement has been satisfied with the information provided by the lexical entry for *Juma*, which includes Ty(e) and Fo(juma'). In contrast to the other transition rules which are optional, it is assumed that the rule of THINNING must obligatorily apply to a requirement that has been satisfied. Although it may apply at an earlier or later stage in the derivation, it must apply before the derivation is complete since the parsing process cannot be completed successfully if there are any requirements outstanding on the tree.

4.7.4 COMPLETION

The rule of COMPLETION moves the pointer (◊) from a daughter node that has a satisfied type requirement to its mother node. Once pointer movement is complete, the information that a requirement has been satisfied at one of the daughter nodes is encoded on the mother node. The rule of COMPLETION can be seen as a pointer movement rule that facilitates the parsing process. The rule is shown in (382).

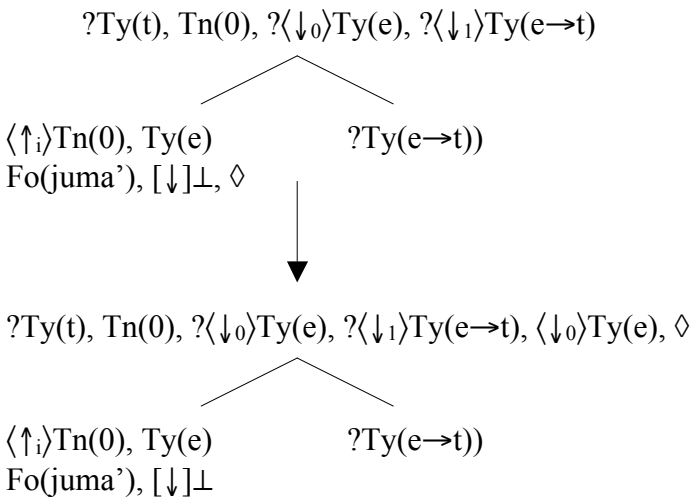
(382) The rule of COMPLETION

$$\frac{\{\ldots\{\ldots Tn(n),\ldots\},\ \{\langle\uparrow_i\rangle Tn(n),\ \ldots,\ Ty(X)\ \ldots,\ \Diamond\}\ldots\}}{\{\ldots\{Tn(n),\ \ldots,\langle\downarrow_i\rangle Ty(X),\ \ldots,\ \Diamond\},\ \{\langle\uparrow_i\rangle Tn(n),\ \ldots,\ Ty(X),\ \ldots\}\ldots\}}$$

Where $i \in \{0,1,*\}$

The effect of the rule of COMPLETION can be seen on comparison of the trees in (383) below, where the pointer moves from the subject node to the root node.[50]

(383) The effect of COMPLETION



As a comparison of the first tree and the second tree reveals, the rule of COMPLETION ensures that the root node in the second tree also carries the information about its argument daughter node. Whilst the exact nature of the daughter relation is left underspecified, the rule of COMPLETION specifies that the daughter node must be of a certain type (⟨↓$_i$⟩Ty(X)). In the example above, this can be seen in the form of the annotation ⟨↓$_0$⟩Ty(e) at the root node. Since the root node contains both a ?Ty(e) and the statement that its argument daughter is Ty(e), the rule of THINNING will subsequently apply. The COMPLETION rule also results in the movement of the pointer from the Tn(00) node to the Tn(0) node.

4.7.5 ANTICIPATION

Whilst the rule of COMPLETION moves the pointer from a daughter node that has a satisfied type requirement to its mother node, the rule of ANTICIPATION moves the pointer from a mother to a daughter node in the instance in which an unsatisfied requirement is present in the daughter node. The rule is defined as shown in (384).

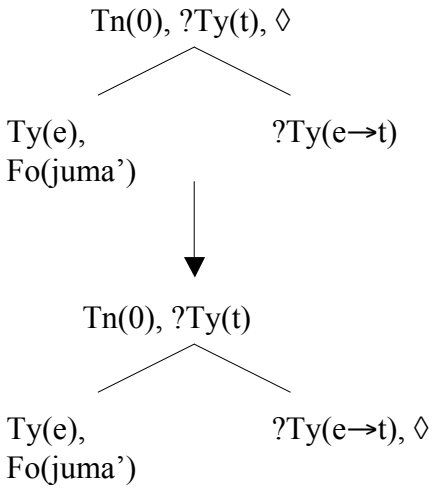
[50] The bottom restriction ([↓]⊥) is not shown in subsequent trees unless its presence is central to the analysis under discussion.

(384) The rule of ANTICIPATION

$$\frac{\{\ldots\{\ldots Tn(n),\ldots, \Diamond\}, \{\langle\uparrow\rangle Tn(n), ?X \ldots\}\ldots\}}{\{\ldots\{Tn(n), \ldots\},\{\langle\uparrow\rangle Tn(n), ?X \ldots, \Diamond\}\ldots\}}$$

The effect of the rule of ANTICIPATION can be seen in the trees in (385) below, where it serves to move the pointer from the root node to its daughter functor node.

(385) Effect of ANTICIPATION



As can be seen on examination of the trees above, the effect of this pointer movement rule is to move the pointer down from the (mother) root node to the (daughter) predicate node with the outstanding requirement ?Ty(e→t). The parsing process for this example will then continue with the lexical entry annotating this functor node, followed by the application of THINNING and COMPLETION. Once this has been done, no outstanding requirements remain at the terminal nodes. However, there remains an unsatisfied requirement at the top node of the obtained tree derivation (?Ty(t)). The computational rule of ELIMINATION subsequently applies at this root node.

4.7.6 ELIMINATION

The rule of ELIMINATION operates when both daughter nodes have satisfied type and formula values. The rule of ELIMINATION has two tasks. First, it combines two daughters, resulting in the annotation of the node under development. Then it

performs functional application over the formulae of the two daughter nodes, annotating the node under development with the resulting formula. The rule includes a further condition that no outstanding requirements exist in any of the two daughter nodes. If the latter is not true and there are outstanding requirements in any of the two daughter nodes, the rule of ELIMINATION cannot apply. The rule of ELIMINATION is shown in (386) below.

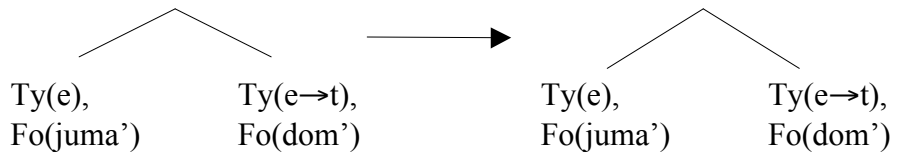
(386) The rule of ELIMINATION

$$\frac{\{\ldots\{\langle\downarrow_0\rangle(\mathrm{Fo(a)}, \mathrm{Ty(X)}), \langle\downarrow_1\rangle\mathrm{Fo(b)}, \mathrm{Ty(X{\rightarrow}Y)}, \ldots, \Diamond)\}\ldots\}}{\{\ldots\{\mathrm{Fo(b(a))}, \mathrm{Ty(Y)}, \langle\downarrow_0\rangle(\mathrm{Fo(a)}, \mathrm{Ty(X)}), \langle\downarrow_1\rangle(\mathrm{Fo(b)}, \mathrm{Ty(X{\rightarrow}Y)}, \ldots,\Diamond)\}\ldots\}}$$

Condition: $\langle\downarrow_i\rangle?\phi$ does not hold and $i \in \{0,1\}$

The effect of the rule of ELIMINATION can be seen in (387) below. In the first tree both of the daughter nodes have satisfied type and formula values. The rule of ELIMINATION works to deduce a new type and results in the annotation of the root node with the information Fo(mwaas~~u~~') and Fo(dom') from the two daughter nodes. The pointer is left at the root node following the application of the ELIMINATION rule.

(387) Tn(0), ?Ty(t), ◊ → Tn(0), Ty(t), Fo(dom'(juma')), ◊



4.7.7 The ADJUNCTION rules

A central assumption in the DS framework is that natural languages are to a large extent underspecified with regards to both content and structure. Structural underspecification is encoded using a set of computational rules called the ADJUNCTION rules.[51] The first of the ADJUNCTION rules discussed here is the rule of

[51] Structural underspecification in Dynamic Syntax can be considered similar to functional uncertainty in Lexical Functional Grammar.

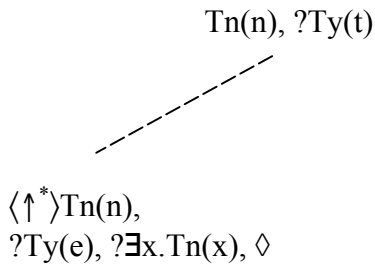
*ADJUNCTION, which is responsible for the projection of an unfixed ?Ty(e) node from a ?Ty(t) node. The rule of *ADJUNCTION encodes structural underspecification since the unfixed node it introduces does not carry a fixed tree node address. However, the unfixed node does contain the information that somewhere in the tree, below the root node, a specific tree node (Tn(n)) must be found. The rule of *ADJUNCTION also imposes a requirement for the identification of a fixed tree node address on this newly constructed node (?∃x.Tn(x)). These requirements together ensure that the tree node will obtain a fully specified tree node address at some point in the parsing process and necessarily before the derivation is complete. The rule of *ADJUNCTION, as defined in Cann et al. (2005b:61), is provided in (388) below.

(388) The rule of *ADJUNCTION

$$\frac{\{\ldots\ \{\{Tn(a),\ldots,\ ?Ty(t),\ \Diamond\}\}}{\{\ldots\{\{Tn(a),\ldots,\ ?Ty(t)\},\ \{\langle\uparrow^{*}\rangle Tn(a),\ ?\exists x.Tn(x),\ldots,?Ty(e),\ \Diamond\}\}\ldots\}}$$

An unfixed node is built from the root node (Tn(0)) and carries with it a requirement for an argument type (?Ty(e)) and for a fixed tree node address ((?∃x.Tn(x)). The effect of the *ADJUNCTION rule is shown in the tree in (389) below, which shows the projection of an unfixed Ty(e) node.

(389) The effect of *ADJUNCTION



When the rule of *ADJUNCTION occurs, it does so at an early stage in the derivation – when the tree comprises only of a single node with the requirement for a type *t* formula (?Ty(t)). It is used for the processing of fronted constituents, such as left-dislocated constituents and wh-question words (Kempson et al. 2001:150-189; Cann et al. 2005b:153–154; Bouzouita 2008b Chapter 5), as well as for the projection of

clause-initial potential subject NPs in some Bantu languages (Kempson and Marten 2002). The analysis I adopt for processing fronted constituents in Rangi, such as wh-question expressions, also employs *ADJUNCTION and the projection of an unfixed node. This is shown in Chapter 6.

4.7.8 MERGE

The rule of MERGE unifies two nodes in an instance in which one of the two nodes can update the tree node address of the other node. The notion of update in this context is defined by the tree node address entailment, meaning that if a tree node address entails another tree node address, then the former can be seen as an update of the latter. In this sense, an underspecified address such as $\langle\uparrow^*\rangle$Tn(n), as is seen as a result of the *ADJUNCTION rule, can be updated to a more specified address such as $\langle\uparrow\rangle$Tn(a), but only in instances in which the two nodes do not bear any conflicting specifications. The rule of MERGE as defined in Cann et al. (2005b:65) is shown in (390) below, where DU stands for Declarative Unit.

(390) The rule of MERGE

$$\frac{\{\ldots\{\ldots, \mathrm{DU}, \mathrm{DU'}, \ldots\}\ldots\}}{\{\ldots\{\ldots, DU \cup DU', \ldots\}\ldots\}}$$

Where $\Diamond \in DU'$ and $DU \cup DU'$ is consistent

As can be seen on examination of the definition above, this rule is a general rule. The only constraints on this rule are that the pointer is one of the decorations on one of the fixed nodes (DU), and that the two DUs unify. The effect of the application of the rule of MERGE is the unification of information. This is a concept which is similar to that found in frameworks such as Generalised Phrase Structure Grammar (Gazdar et al. 1985) and Head-driven Phrase Structure Grammar (Pollard and Sag 1987; Pollard and Sag 1994). The rule of MERGE takes place where there is an unfixed node annotation with a formula of a certain type and a fixed node requiring that type (Cann et al. 2005b:65).

4.7.9 LOCAL *ADJUNCTION

The second of the ADJUNCTION rules discussed here is a more restricted version of *ADJUNCTION called LOCAL *ADJUNCTION. Also used to express structural underspecification, LOCAL *ADJUNCTION is used to express that the term which is to be parsed, despite being structurally underspecified, is introduced as an argument local to some tree node Tn(a), which is decorated with the propositional requirement ?Ty(t). The rule of LOCAL *ADJUNCTION as defined by Cann et al. (2005b:234) is shown in (391) below.

(391) The rule of LOCAL *ADJUNCTION

$$\frac{\{\ldots\{Tn(a), ?Ty(t), \Diamond)\}\}}{\{\ldots\{Tn(a), ?Ty(t)\}, \{\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a), ?Ty(e), ?\exists\mathbf{x}.Tn(\mathbf{x}), \Diamond\}\}}$$

Formally, *ADJUNCTION and LOCAL *ADJUNCTION are distinguished by the presence of the composite operator $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$, which is used for the more restricted (locally) underspecified tree relation found in LOCAL *ADJUNCTION. Multiple applications of either the *ADJUNCTION rule or the LOCAL *ADJUNCTION rule would result in the two underspecified nodes collapsing since they will be defined in terms of the same underspecified tree relation. As such, the co-existence of two unfixed nodes of the same modality is formally prohibited within DS. The distinction introduced by the composite operator $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$ however, means that an unfixed node will not collapse onto a locally unfixed node since they are defined distinctly.

As was also seen with the *ADJUNCTION rule, LOCAL *ADJUNCTION introduces a locally unfixed node which carries a requirement for a fixed tree node address (?∃x.Tn(x)). However, LOCAL *ADJUNCTION is not restricted to appearing in the left-periphery and can be activated throughout the derivation. Locally unfixed nodes are frequently used to capture local scrambling phenomena (Cann et al. 2005b Chapter 6) and to capture the introduction of subject information in Bantu languages (see section 4.9). Starting from the AXIOM, the rule of LOCAL *ADJUNCTION projects a locally unfixed node with a requirement for a fixed tree node address (?∃x.Tn(x))

and a ?Ty(e) node. The effect of the LOCAL *ADJUNCTION rule can be seen in the tree in (392) below.

(392) Parsing: *Mary,...*

Tn(n), ?Ty(t)

$\langle\uparrow_0\rangle\langle\uparrow_1{}^*\rangle$Tn(n),
?∃x.Tn(x), ?Ty(e), ◊

4.7.10 LATE *ADJUNCTION

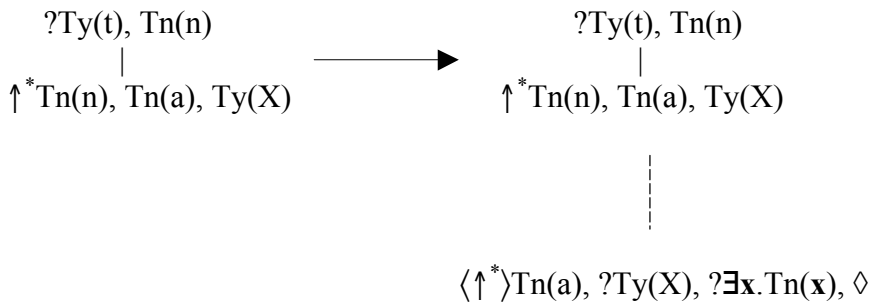
Cann et al. (2005b:192–221) and Cann et al. (2005a:524) also propose a rule for the introduction of an unfixed node at a later stage in the parsing/production process. This is known as LATE *ADJUNCTION and is used to introduce an unfixed node after the node from which the unfixed node is being built has already been annotated with a type value. The definition of the LATE *ADJUNCTION rule is shown in (393) below.

(393) The rule of LATE *ADJUNCTION

$$\frac{\{\ldots\{\mathrm{Tn(n)}, ?\mathrm{Ty(t)}, \ldots,\}\{\uparrow^* \mathrm{Tn(n)}, \mathrm{Tn(a)}, \ldots, \mathrm{Ty(X)}, \Diamond\},\ldots\}}{\{\ldots\{\mathrm{Tn(n)},\ldots,\}\{\uparrow^*\text{-}\mathrm{Tn(n)}, \mathrm{Tn(a)}, \ldots, \mathrm{Ty(X)}\}, \{\langle\uparrow^*\rangle\mathrm{Tn(a)}, ?\mathrm{Ty(X)}, ?\exists\mathbf{x}.\mathrm{Tn}(\mathbf{x}), \Diamond\},\ldots\}}$$

Unlike the other versions of *ADJUNCTION, LATE *ADJUNCTION introduces an unfixed node which requires an expression with the same type decoration as the node from which it is being built. This can be seen on comparison of the trees in (394) below, where the second tree also projected an unfixed ?Ty(X) node.

(394) The effect of LATE *ADJUNCTION



The rule of LATE ADJUNCTION has been used to account for right-periphery phenomena or sentence extraposition in English (see Bouzouita (2008b:214) and Cann et al. (2005b:194–198)).

4.7.11 LINK ADJUNCTION

LINK structures are another formal strategy for the representation of structural underspecification. LINK structures involve the development of two separate and parallel trees connected by a LINK relation, with a requirement for some information to be shared by both trees. The node (and subsequent parallel tree) from which the LINK starts is taken as the context against which the LINKed tree is parsed. LINK structures are created by the rule of LINK ADJUNCTION. The LINK ADJUNCTION rule is defined by Cann et al. (2005b:88), as shown in (395) below.

(395) The rule of LINK ADJUNCTION

$$\frac{\{\ldots\{Tn(a), Fo(\alpha), Ty(e), \Diamond\},\ldots\}}{\{\ldots\{Tn(a), Fo(\alpha), Ty(e)\}\ldots\}\{\langle L^{-1}\rangle Tn(a), ?Ty(t), ?\langle\downarrow_*\rangle Fo(\alpha), \Diamond\}}$$

The modal operator $\langle L\rangle$ and its converse operator $\langle L^{-1}\rangle$ are used to define the LINK structure. The first of these relations ($\langle L\rangle$) traverses the LINK relation from the LINKed node to the node where the LINK starts. The inverse ($\langle L^{-1}\rangle$) traverses the LINK relation in the opposite direction. In addition to the construction of a new tree with a ?Ty(t) at the top node, this process also imposes the requirement for a copy of the head node formula ($?\langle\downarrow_*\rangle Fo(\alpha)$) somewhere within the 'new' tree, forcing an anaphoric link between the two structures. The LINK ADJUNCTION rule results in the

establishment of an anaphoric link between the main tree and the LINKed tree, which is forced by the requirement for a copy of the head formula to be present in both trees.

Constructions in which LINK structures are used include relative clauses, hanging-topic left dislocated constructions and adverbial clauses.[52] Different versions of the LINK ADJUNCTION rule are used in different contexts. For example, under the DS analyses of relative clauses, the LINK ADJUNCTION rule (for relative clauses) is used. The LINK ADJUNCTION rule for relative clauses as defined by Cann et al. (2005b:88) is given in (396) below.

(396) The rule of LINK ADJUNCTION (for relatives)

$$\frac{\{\ldots\{Tn(a), Fo(\alpha), Ty(e), \Diamond\}\ldots\}}{\{\ldots\{Tn(a), Fo(\alpha), Ty(e)\}\ldots\}, \{\langle L^{-1}\rangle Tn(a), ?Ty(t), ?\langle\downarrow_*\rangle Fo(\alpha), \Diamond\}}$$

Under such analyses, the relative head noun is LINKed to the relative clause via a LINK relation which connects the relative head noun to the ?Ty(t) node in the tree. Whilst languages vary as to how the copy of the head formula is provided, it is the LINK ADJUNCTION rule which creates the LINK relation. In English relative clauses for example, the relative pronoun *who* provides the required copy of the head formula used (Kempson et al. 2001; Cann et al. 2005b).

The LINK ADJUNCTION rule used for modelling Bantu subjects is the topic structure requirement rule, reflecting the status of potential subject NPs as topics. This rule is defined by Cann et al. (2005b:170), as shown in (397) below.

[52] I analyse subject NP expressions in Rangi as being projected onto LINK structures when they are first parsed (see section 4.9.3). Likewise, I employ a LINK structure analysis for relative clauses, subordinate clauses introduced by *kooni* and cleft constructions (see Chapter 6).

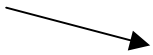
(397) TOPIC STRUCTURE REQUIREMENT rule

$$\frac{\{\{Tn(0), ?Ty(t)\}, \{\langle L\rangle Tn(0), Fo(\alpha), Ty(e), \Diamond\}\}}{\{\{Tn(0), ?Ty(t), ?\langle D\rangle Fo(\alpha), \Diamond\}\}, \{\langle L\rangle Tn(0), Fo(\alpha), Ty(e)\}}$$

The use of the ⟨D⟩ operator encodes the weakest of all tree relations. This is a requirement that there be a copy of the term just completed on the parallel tree structure, somewhere in the development of this newly introduced root node. The effect of this rule can be seen in (398) below.

(398) The effect of the TOPIC STRUCTURE REQUIREMENT rule

⟨*L*⟩Tn(0), Ty(e), Fo(juma'), ◊



Tn(0), ?Ty(t), ?⟨*D*⟩Fo(juma'),

As can be seen on examination of the tree above, the topic structure requirement rule introduces a parallel tree which is linked to the main tree via a LINK structure. This rule also has the effect of introducing a requirement for a copy of the term just completed – in this case, Fo(juma') – present in the main tree.

4.8 Lexical rules as mechanisms of tree growth

The second mechanism of tree growth is through lexical rules and the lexical actions associated with them. In Dynamic Syntax, as in other lexicon-driven frameworks such as seen in Lexical Functional Grammar (LGF) (Kaplan and Zaenan 1989; Bresnan 2001; Dalrymple 2001) and Head-Driven Phrase Structure Grammar (HPSG) (Sag and Wasow 1999), the lexicon plays a central role. Lexical rules encode lexical actions which map one tree description to the next one. Each word or morpheme has its own lexical entry which provides distinct information about how the parse, and the associated semantic trees, can unfold. As such, lexical rules are powerful since they may introduce requirements, annotate nodes and induce tree structure by way of the addition of nodes to the tree under construction.

Whilst lexical rules also lead to the unfolding and construction of tree structures, they can only be triggered by the processing of lexical information. Thus, the lexical entry of a particular word or morpheme is triggered by the uttering of the element in question. In contrast, transition rules do not have lexical triggers, although the appropriate input must be present for a transition rule to apply. Another important distinction between lexical rules and transition rules is that the application of transition rules is optional. However, since lexical rules are activated by the processing of lexical material, there application is obligatory.

Lexical actions are represented through a set of conditional actions which take the form IF THEN ELSE. A lexical action will apply IF the triggering condition holds at the node under development. The IF clause may include the presence (or absence) of labels at that node, statements about decorations located at descriptions related to the node at which the pointer is located, and requirements (Kempson et al. 2001:77). The IF statement therefore shows the lexical trigger – the condition(s) that must hold for the lexical actions to result. If the condition holds, the THEN statement applies. The THEN statement contains lexical actions which are performed and which result in the creation of a new tree description. If the condition of the IF statement (the trigger) does not hold at the node under construction the ELSE clause applies, and usually provides that the derivation is to be suspended – indicated by the instruction to abort. The format in which lexical rules are presented is shown in (399) below.

(399) The format of lexical rules

IF	α	*Trigger*
THEN	make(x)	*Action*
	go(x)	
	put(x)	
	abort	
ELSE	…	*Elsewhere statement*

Lexical entries have a trigger. This means that if the decoration α appears on the node bearing the pointer, then the stated actions will be triggered. These actions include, 'make(x)', which means build a node *x*, 'go(x)', which means go to location

x, 'put(x)', which means annotate the current node with decoration *x* and 'abort', which means abort the parsing process. The 'abort' action is often used in the elsewhere statement and means that if the node that bears the pointer is not annotated with the decoration α (the trigger provided in the IF statement), then the parsing process cannot proceed.

Control features also interact with lexical rules, acting as 'conditions guarding actions' (Kempson et al. 2001:289–290). Control features are not present in a tree but can function as the triggering point of a word's (or morpheme's) lexical entry. An example of a control feature is the use of a statement referring to the current state of affairs of a partial tree that, if satisfied, will trigger parsing of a given word. This can be seen in (400) below, where the trigger for the lexical item in questions is the presence of a locally unfixed node which is represented by ?Ty(e), $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$?Ty(t).

(400) IF ?Ty(e), $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$?Ty(t)
THEN ACTIONS
ELSE abort

The lexical trigger ?Ty(e),$\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$?Ty(t) shown above states that if, and only if, the pointer is at a locally unfixed node, the lexical actions contained within the THEN statement can apply. If this is not the case, then abort. Such a trigger is a control feature, since the statement ?Ty(e), $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$?Ty(t) ensures that the lexical actions are induced only when these conditions are satisfied. In this way, lexical rules and the lexical actions associated with them combine with computation rules and the actions they encode to ensure and constrain tree growth.

This chapter has thus far been concerned with presenting the formal tools employed by the Dynamic Syntax framework and the mechanisms of representation. As well as presenting the computational rules for the purposes of further understanding the framework, this section has introduced the ADJUNCTION rules that are responsible for the introduction of unfixed nodes and LINK structures. These mechanisms are central to the framework and, as will be seen in Chapter 5 and Chapter 6, are also central to the DS characterisations of the Rangi clause structure, which I argue, revolve around

structural and semantic underspecification. Before the formal characterisations of the Rangi auxiliary constructions are presented, the second half of this chapter will explore a number of issues that are central to the Dynamic Syntax modelling of Bantu languages.

4.9 Modelling Bantu languages in Dynamic Syntax

Languages vary in the balance between lexical and transition rules that are involved in the establishment of propositional structure. For Bantu, the basic assumption is that subject markers project metavariables which can in turn be resolved from context, tense-aspect markers project partial tree structure and verbs make the semantic (and in some instances, also structural) contribution to the parse. Such an approach closely mirrors syntactic analyses in other lexicon-driven frameworks such as LFG (Kaplan and Zaenan 1989; Bresnan 2001; Dalrymple 2001) and HPSG (Pollard and Sag 1994; Sag and Wasow 1999; Sag et al. 2003), as well as being comparable to movement analyses of Bantu structure (see Buell (2005); Riedel (2009); Zeller (2010)).

The challenge presented by the data from Bantu languages is the ordering of the morphemes within the verbal template. Although not all morphemes are present in any given verb form, the order in which they appear is rigid. Modelling this ordering alongside the incremental and compositional contribution made by the morphemes, is one of the main challenges that modelling Bantu languages provide for formal analyses and the DS analysis presented in this thesis.

Bantu languages have a rich verbal complex, typically containing a subject marker, a tense marker, an optional object marker, and an obligatory verb stem. Bantu languages allow both subject and object pro-drop constructions, with the subject marker and object marker (when present) showing concord with subject and object arguments. Basic predicate-argument structure in Bantu languages can typically be esablished from morphological information contained within the inflected verb form. The presence of an overt lexical noun phrase is often pragmatically motivated. The DS approach to Bantu structure has been that individual morphemes of the verbal

structure make their own, lexically specified contribution to tree development (Cann et al. 2005b Chapter 7; Marten 2007; Marten et al. 2008; Kempson et al. 2011b; Marten and Kula 2011:65).

The aim of this section is to present the main assumptions which have been made in the development of the Dynamic Syntax framework that are pertinent to analyses of Bantu languages. The section begins with a discussion of the modelling of pro-drop constructions which are widespread in Bantu languages, before going on to look at subject and object agreement and the encoding of temporal and aspectual distinctions. The contribution made by the verb stem and the establishment of propositional structure as a whole will also be considered. The issues which relate to general Bantu clause structure are discussed alongside DS analyses of specific phenomena, drawing on previous analyses of passive constructions (Marten et al. 2008), relative clauses (Marten and Kula 2011), cleft constructions (Kempson et al. 2011b) and agreement (Marten 2010). This is followed in section 4.9.2 by a sample derivation of a Swahili utterance, which will exemplify the modelling of the Swahili verbal template. A discussion of the main considerations for analysing Rangi clause structure within Dynamic Syntax will also be presented, laying the foundation for the formal analysis of Rangi auxiliary-based constructions which comprises the focus of Chapters 5 and 6.

4.9.1 Modelling Swahili clause structure in Dynamic Syntax

The first challenge for modelling SVO Bantu languages such as Swahili and Rangi relates to the processing of the subject expression. With subject pro-drop commonplace across Bantu and subject markers obligatory on the verb form, the presence of an overt subject NP is taken to be motivated by pragmatic considerations. The presence of an overt lexical noun phrase typically serves to introduce new information, or to background information against which the main assertion is assessed (Marten and Kula 2011:65).

Three strategies are made available in DS for the parsing of subject expressions cross-linguistically. One strategy involves the use of a locally unfixed node for

which the fixed tree node address is resolved at a later stage in the derivation. This happens as a result of constructive case (in Latin, for example) or through information which is made available at a later stage in the derivation (as I argue for Rangi). The second strategy for parsing subject expressions involves the subject expression being connected to the main tree via a LINK relation, whilst the third strategy involves the projection of the NP expression onto an unfixed node.

The first strategy for parsing subject expressions has been employed in DS analyses of Standard Modern Greek (Chatzikyriakidis 2010) and Romance languages, specifically Latin (Kempson and Chatzikyriakidis 2009; Kempson et al. forthcoming). Under these analyses, constructive case is used to fix the tree node address of a locally unfixed node resulting in its adoption of the role of the logical subject. Since Bantu languages do not have grammatical case which could function like constructive case and fix the tree node address into that of the subject, the constructive case strategy is not considered in any further detail here.

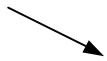
Bantu subject expressions can therefore be parsed using one of two processing strategies; a LINK structure or an unfixed node. When NP subject expressions are analysed using LINK structures, their relationship to the verbal template and the subject is determined through an anaphoric relation represented by a LINK structure. Alternatively, full NP potential subject expressions can be modelled as annotating unfixed nodes, reflecting their status as potential subjects but, also that they have not yet received a fixed tree node address within the tree under development.

Under the LINK structure analysis, the overt subject NP is projected onto a tree which is constructed in parallel to the main tree. This independent tree is decorated solely with information from the potential subject NP. The rule of LINK ADJUNCTION introduces a requirement that a copy of the information from the NP expression is

also present somewhere in the parallel tree before the derivation is complete.[53] This is represented at the root node of the main tree, as can be seen in (401) below.

(401) Parsing: *Juma…*

$\langle L \rangle$Tn(0), Fo(juma'), Ty(e), ◊



Tn(0), ?Ty(t), ?$\langle \downarrow_* \rangle$Fo(juma')

The rule of LINK ADJUNCTION introduces a requirement that the head node formula (in this case *Juma)* is present in the main tree. This requirement is represented by ?$\langle \downarrow_* \rangle$?Fo(juma') holding at the root node of the main tree. The LINK structure provides the context against which any subsequent subject information can be interpreted. Since the next element to be parsed in a typical Bantu utterance would be the subject marker, the information annotating the LINKed tree provides the background against which the subject marker on the verb can be interpreted. This will be examined in further detail after the discussion of the second strategy for parsing subject expressions.

The second option for parsing a Bantu potential subject NP involves an unfixed node. Under the unfixed node analysis, the full NP potential subject decorates an unfixed node which contains the requirement for a type *t* expression to be present somewhere above the current node ($\langle \uparrow^* \rangle$?Ty(t)). The unfixed node can be seen in the tree in (402) below.

[53] As will be seen in section 4.9.3, I adopt the LINK structure analysis for modelling Rangi potential subject expressions.

(402) Parsing: *Juma…*

?Ty(t)

⟨↑*⟩Tn(0),
Ty(e), Fo(juma'), ◊

Under the unfixed node analysis, the subject expressions will have an unfixed tree node address until fixed structure is introduced into the derivation. In Swahili, this happens after the introduction of the tense-aspect marker. The tense-aspect marker projects fixed structure, enabling the fixing of the subject NP expression as the logical subject of the clause.

Bantu subject expressions can therefore be parsed using one of two processing strategies: a LINK structure or an unfixed node. When NP subject expressions are analysed using LINK structures, their relationship to the verbal template and the subject marker is determined through an anaphoric link represented by a LINK structure. Alternatively, full NP potential subject expressions can be modelled as annotating unfixed nodes, reflective of their status as potential subjects but also the fact that they have not yet received a fixed tree node address within the tree under development. The next element to be parsed in a typical Swahili clause is the subject marker.

Subject markers annotate locally unfixed nodes which, in the case of Swahili at least, are introduced by the rule of LOCAL *ADJUNCTION. Part of the motivation for analysing Bantu subject (and object markers) as annotating locally unfixed nodes comes from the analysis of passive constructions, where the so-called 'subject' markers decorate the object position. The locally unfixed node analysis is similar to that provided for object clitics in Romance, which are also analysed as annotating locally unfixed nodes. The similarities between the analyses provided for Bantu subject (and object) markers and Romance clitics reflects other noted parallels

between the referential properties exhibited by these elements in their distinct language families. Moreover, the use of locally unfixed nodes to analyse both of these phenomena reflects the encoding of structural underspecification and the local construal of these elements in each instance. Whilst the locally unfixed node is induced by the rule of LOCAL *ADJUNCTION in Swahili, the analysis presented for Romance clitics is that the locally unfixed node is introduced through the lexical actions induced by the clitic itself.[54]

There are also differences between the analyses provided for Bantu and those provided for Romance clitics in relation to the availability of constructive case to lexically provide fixed tree addresses and with respect to the bottom restriction as part of the lexical entries of clitics. One important difference is that constructive case is not available in Bantu, whilst the use of constructive case to fix the structural relation as that of a subject is an available strategy in Romance languages and a number of dialects of Modern Greek (Bouzouita and Chatzikyriakidis 2009; Kempson and Chatzikyriakidis 2009). Whilst multiple clitics are possible in a number of contexts in Romance languages, many Bantu languages have a restriction on the number of object markers that can appear in the verbal template. In DS terms this restriction can be accounted for by reference to the analysis under which object markers project locally unfixed nodes and the standard DS restriction on the co-occurrence of more than one unfixed node of the same modality at any time.

In order to account for those Bantu languages which do allow for more than one object marker in the verbal template, the object markers can be understood as inducing a complex of nodes built from a single immediate unfixed propositional node as is characteristic of scrambling languages (Kiaer 2007; Marten et al. 2008), it can be proposed that each node which is induced by an object marker is fixed immediately upon introduction and, crucially, before the next object marker is

[54] The analysis I propose for Rangi is also one under which the subject marker is responsible for the projection of the locally unfixed node. See section 4.9.3.

parsed (see McCormack (2008) for discussion on a pragmatic notion of constructive case).

In order to account for multiple clitics in Medieval Spanish and Modern Greek, an analysis involving a case filter has been proposed in order to account for clitic placement restrictions such as the Person Case Constraint (Kempson and Chatzikyriakidis 2009). Under the analysis presented by Bouzouita and Chatzikyriakidis (2009), the first clitic in a cluster is projected onto a locally unfixed node but introduces a case filter that restricts the potential fixing sites of the node although without itself fixing the node.

Finally, the issue of whether pronominal forms introduce a bottom restriction further differentiates analyses of Bantu and Romance languages. Pronominal elements, in contrast to full lexical words, provide only a partial characterisation of a term that has to be further developed. A restriction on this further development is introduced by the bottom restriction, which indicates that the present node is a terminal node and as such, no further development can take place. English pronouns introduce a bottom restriction since the formula value they provide is projected onto a terminal node in the tree (Kempson and Marten 2002). In the analysis provided by Bresnan and Mchombo (1987), Bantu subject markers are ambiguous between anaphoric and grammatical agreement. Since Bantu subject markers are not necessarily associated with topicalized subjects, they do not have a bottom restriction. The absence of the bottom restriction in the case of Bantu subject markers can further account for the co-occurrence of clitics and co-referential NPs in many Bantu languages. This means that with one lexical characterisation of either subject or object markers, two different subject-verb relations can be modelled – with the subject NP as a LINK structure or as a locally unfixed node.

The unfixed node approach has been extended to the analysis of subject and object markers in Bantu languages such as Swahili (Marten 2005), Otjiherero (Marten 2010), Bemba (Marten and Kula 2011:65) and Siswati (Kempson et al. 2011b).

Where the analysis differs between the languages (and also between Bantu and Romance), is the mechanism responsible for the projection of the unfixed node. The analysis provided for Swahili is one under which the subject markers provide an annotation for a locally unfixed node introduced by the rule of LOCAL *ADJUNCTION.

In Swahili the subject marker does not induce the building of a locally unfixed node, but merely provides the metavariable decoration for it without providing an update to the structural relations. In contrast to this, the analysis provided for the Romance languages and also for a number of varieties of Modern Greek is that the clitic itself is responsible for the introduction of the locally unfixed node. The same will also be argued to be the case for Rangi, where I argue that the lexical actions induced by the subject marker projects the locally unfixed node (see section 4.9.3 below). This has the desired effect of constraining the system of generalised rules as well as prohibiting full lexical NPs from decorating locally unfixed nodes.

Parsing the subject marker in Swahili is analysed as resulting in the annotation of a locally unfixed node with a pronominal metavariable formula, the interpretation of which is restricted by the noun class information of the subject marker. Whilst these locally unfixed nodes are representative of underspecification, they do encode a pronominal metavariable – Fo$\mathbf{U}_{\text{CLASS1}}$. This can be seen in the lexical entry provided in (403) below.

(403) lexical entry for Swahili subject marker *a-*

a-	IF	?Ty(e), $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$?Ty(t)
	THEN	put(Ty(e), Fo(U_{CLASS1}), ?∃x.Fo(x))
	ELSE	abort

As can be seen on examination of the lexical entry shown above, the subject marker has the presence of a locally unfixed node as its lexical trigger. In the presence of this locally unfixed node (which is introduced via the rule of LOCAL *ADJUNCTION), the lexical actions result in the annotation of the unfixed node with Ty(e), the

restricted metavariable Fo(U_{cLASS1}) and the requirement that this receives interpretation before the derivation is complete – represented by ?∃x.Fo(x). If these conditions are not met, the parse will abort.

In instances in which the subject NP expression has been projected onto a LINK structure, the locally unfixed node is projected in parallel with the LINK structure, as can be seen in the tree in (404) below.

(404) Parsing: *Juma a-*

$\langle L \rangle$Tn(0), Fo(juma'), Ty(e)

Tn(0), ?Ty(t), ?$\langle \downarrow_* \rangle$Fo(juma')

$\langle \uparrow_0 \rangle \langle \uparrow_1 * \rangle$?Ty(t),
Ty(e), Fo(U_{CLASS1}'), ◊

Providing they agree in noun class terms, the LINKed tree provides the background against which the subject marker can be interpreted, allowing for the identification of the LINKed NP expression as the logical subject of the clause even though its tree node address remains unfixed. The update of the metavariable placeholder to the full formula value Fo(juma') can be seen in the tree in (405) below.

(405) Parsing: *Juma a-...*

$\langle L \rangle$Tn(0), Fo(juma'), Ty(e)

Tn(0), ?Ty(t), ?$\langle\downarrow_*\rangle$Fo(juma')

$\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$Tn(0),
Ty(e), Fo(juma'), $\Diamond$

In analyses under which the NP subject expression is projected onto an unfixed node, the locally unfixed node is projected in addition to the unfixed node, as can be seen in the tree in (406) below.

(406) Parsing: *Juma a-...*

$\langle L \rangle$Tn(0), Fo(juma'), Ty(e)

Tn(0), ?Ty(t), ?$\langle\downarrow_*\rangle$Fo(juma')

$\langle\uparrow^*\rangle$Tn(0),
Ty(e), Fo(juma')

$\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$Tn(0),
Ty(e), Fo(U_{CLASS1})
?$\exists$x.Tn(x), $\Diamond$

Providing the potential subject NP expression and the subject marker encode the same noun class, the two nodes unify. This is possible because the actions induced by the subject marker introduce the local domain within which the potential subject expression can be interpreted. This results in the annotation of the unfixed node with the information provided by the subject NP, as can be seen on examination of the tree in (407) below.

(407) Parsing: *Juma a-…*

$\langle L \rangle$Tn(0), Fo(juma'), Ty(e)

Tn(0), ?Ty(t), ?$\langle\downarrow_*\rangle$Fo(juma')

$\langle\uparrow_0\rangle\langle\uparrow_1{}^*\rangle$Tn(0),
Ty(e), Fo(juma'), $\Diamond$

In Swahili therefore, parsing the subject marker results in the projection of a locally unfixed node annotated with a restricted metavariable. The locally unfixed node is dominated by the root node but is unfixed with respect to the rest of the tree and must receive update before the derivation is complete. The metavariable is immediately substituted by information provided by the context, which in this case comes from the NP expression annotating the LINKed tree.

Analysing subject and object markers in Bantu as annotating locally unfixed nodes allows for the freedom of construal within a tightly restricted local domain. The underspecification associated with unfixed nodes prohibits the occurrence of any other such underspecified tree relation until the first instance of underspecification is resolved. Marten et al. (2008) argue that whilst such a notion appears to contradict the view of the Bantu verbal structure as morphologically fixed, it has the advantage of offering a principled analysis of subject- and object-marking restrictions in passive and locative inversion constructions. As was outlined above, the formalisation of local underspecification also reflects the observed parallels between Bantu subject and object markers and Romance clitics, in terms of processing strategies (Marten et al. 2008). With the strategies for parsing subject information

presented, the next section examines the processing of tense-aspect information within the Bantu verbal template, providing examples from Swahili.

Cross-linguistically, tense-aspect information is assumed to be projected from verbs – both auxiliary and content verbs. Bantu languages have dedicated tense-aspect markers which contribute tense-aspect information to a clause. The analysis provided for Bantu tense-aspect markers is that they make a temporal and/or aspectual contribution to the clause, as well as being responsible for the introduction of fixed minimal predicate argument structure (see Kempson and Marten (2002), Cann et al. (2005b), Marten (2005) for Swahili, and Marten and Kula (2011:65) for Bemba).[55] This reflects the probable historical origin of Bantu tense-aspect markers in auxiliary and main verb forms which are also modelled as projecting fixed predicate-argument structure (Botne 1989; Nurse 2008:59; Kempson et al. 2011b:31) (see section 3.2.4 of this thesis for this in Rangi)).

Parsing the Swahili past tense marker -*li*- provides semantic information about the time at which the event or action described by the verb takes place – this is represented by the annotation Tns(PAST) at the root node.[56] It also results in the construction of a fixed subject node and a fixed predicate node, as can be seen on examination of the lexical entry provided in (408) below.

[55] This is also the analysis I pursue for Rangi tense-aspect markers, as can be seen in more detail in section 4.9.3 below.

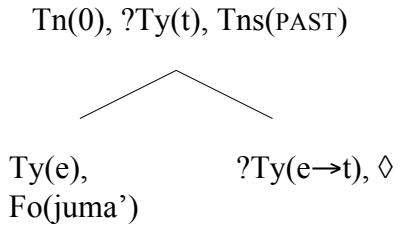
[56] This annotation does not constitute a formal analysis of tense but rather a *pro tem* representation of the tense-aspect information made available in the parse. A comprehensive analysis of tense and aspect is still pending in the Dynamic Syntax framework, although work by Gregoromichelaki (2006) has gone some way to addressing the challenge of representing temporal and aspectual information through the introduction of event variables to the system.

(408) Lexical entry for the past tense marker *-li-*

-li-	IF	?Ty(t), $\langle\downarrow^*\rangle\bot$	
	THEN	IF	$\langle\downarrow_1{}^*\rangle\langle\downarrow_0\rangle$Ty(e)
		THEN	put(Tns(PAST));
			make($\langle\downarrow_0\rangle$); go($\langle\downarrow_0\rangle$); put(?Ty(e)); go($\langle\uparrow_0\rangle$);
			make($\langle\downarrow_1\rangle$); go($\langle\downarrow_1\rangle$); put(?Ty(e→t))
		ELSE	abort
	ELSE	abort	

The lexical trigger for the past tense marker *-li-* is the presence of no fixed structure but the presence of a locally unfixed node, reflecting that the past tense marker obligatorily appears after the subject marker (which annotates a locally unfixed node). In Bantu languages, this constraint is satisfied even when there is a lexical subject or a subject marker already present, since subject NP expressions and subject markers do not build fixed tree nodes. Rather, the nodes which are decorated by these elements (when present) are unfixed, or in the case of an NP, may be LINKed (as outlined above). This restriction also accounts for the ungrammaticality of a tense marker appearing after a verb stem.[57] In the presence of these triggering conditions, parsing the past tense marker *-li-* results in the projection of a fixed subject node and a fixed predicate node and the introduction of the past tense contribution to the clause – represented by the annotation (Tns(PAST)) at the root node. The predicate-argument structure present following the semantic and syntactic contribution made by the past tense marker results in the tree shown in (409) below.

(409) Parsing: *a-li...*



[57] The use of tense-aspect suffixes such as the perfective suffix *-ile* which is widespread across Bantu is discussed in section 4.9.3.

As can be seen on examination of the tree in (409) above, parsing the past tense marker -*li*- results in the projection of a fixed argument node and a fixed predicate node. In the presence of the fixed subject node, the unfixed node annotated with the subject information receives a fixed tree node address and is fixed as the logical subject of the clause. The temporal contribution made by the past tense marker is indicated by the annotation Tns(PAST) at the root node.

It is important to note that the annotations such as Tns(PAST) are not analyses of tense but rather serve as mere representations of temporal information. No detailed examination of tense or aspect was made in Kempson et al. (2001) or in Cann et al. (2005b) and in both of these earlier works, tense was encoded as a diacritic such as Tns(PAST). Despite the fact that a comprehensive analysis of tense is pending in the DS framework, some more general comments regarding tense, making reference to indices and quantifier scope, have been made (see Cann et al (2005b:127; 2011:287)).

Combining information on quantifier scope with tense and aspect can be used for the representation of tense and aspect phenomena. Following this approach, every formula of type *t* is said to be of the form S_i : X, where S_i is a term that denotes the time at which the formula X is said to hold. X is therefore the one entry in the scope statement which is assumed to be fixed independently. To reflect this starting point, ?Ty(t) is modified to contain one term in the attendant scope statement, namely S_i – the constructed index of evaluation. Therefore, what is written above as Tns(PAST) can be represented using indices and quantifier scope as Tns ($S_i < S_{UTT}$) (Cann et al. 2005b:125). Under such a representation S_i denotes the time at which the formula holds, i.e. the event time (E) whilst S_{UTT} denotes the utterance time (also known as speech time or S). An expressions such as Tns ($S_i < S_{UTT}$) therefore means that the reference point proceeds the utterance time and is therefore a past tense expression.

This method of representation is similar to that which has been seen more widely in the literature on tense and aspect which often makes reference to the three temporal points of speech time (S), reference time (R) and event time (E) (see, for example,

Reichenbach (1947); Hornstein (1990); Klein (1994)).[58] Different configurations of these points are associated with different tense and aspect configurations. For example, tense expresses the time at which an even takes places (e.g. past, present, future) and is generally considered to be represented by the relationship between S and R. Aspect, on the other hand, describes the internal structure of an event (e.g. habitual, progressive, perfect) and is captured by reference to the relationship between R and E. For the purposes of the current study, both tense and aspect will be represented as a diacritic at the root node, following Kempson et al. (2001) and Cann et al. (2005b).

Returning to the example under discussion, following the processing of the subject information, the next element to be parsed is the verb stem. A central claim made within the DS framework is that verbs are the major projector of structure since the actions contained within lexical entries of verbs, in conjunction with computational rules and contextual information, are responsible for inducing some or all of the propositional template they express.[59] Verbs in Swahili are analysed as projecting fixed predicate-argument structure as well as making a semantic contribution to the clause, providing the full formula value annotation for the predicate node (Marten 2002). Analysing the verb as also responsible for the introduction of fixed structure reflects the central roles of verbs in the establishment of propositional structure in Bantu. Such an analysis also reflects structural relatedness between verbs, auxiliary forms and tense-aspect markers, as well as between verb stems which carry tense-aspect markers and those which do not – imperatival, infinitival and subjunctive forms – all of which are analysed as projecting fixed structure.

An analysis under which both tense-aspect markers and verbs are taken as projecting fixed predicate-argument structure is based on a premise which is central to the Dynamic Syntax framework. Specifically, that the same parts of predicate-argument structure can be constructed more than once. The construction (and re-construction)

[58] The terminology used to refer to these temporal points varies in the literature but the concepts referred to are roughly the same.
[59] Verbs are also considered to be the major projector of structure in other lexicon-driven theories such as LFG.

of structure already present in the tree is not only permissible in Dynamic Syntax, in some instances it is integral to the analysis and ensures appropriate construal of the utterance. In DS, the same node can be built more than once, provided that the information that is associated with the node is the same in each instance. In Bantu this is seen when a subject marker is parsed on an auxiliary form and a subject marker of the same noun class is parsed again on the main verb form. In such instances, the fact that these nodes collapse onto each other indicates that they are co-referential since they are in fact that same node on the same semantic tree.[60] This follows from the standard mechanisms of tree growth and the dynamics of how information is derived incrementally. The same is true for the minimal predicate-argument structure which is introduced by a pre-stem tense-aspect marker and the verb stem. In such instances, the newly introduced structure will collapse with the pre-existing structure since they are in fact the same semantic tree.

The fixed subject node introduced by parsing the verb also projects a metavariable placeholder Fo(**U**), whilst the predicate node receives the full predicate value annotation. This can be seen upon examination of the lexical entry for the Swahili verb stem -*fik*-, based on Cann et al. (2005b:305), which is shown in (410) below.

(410) Lexical entry for the verb stem -*fik*- 'arrive'

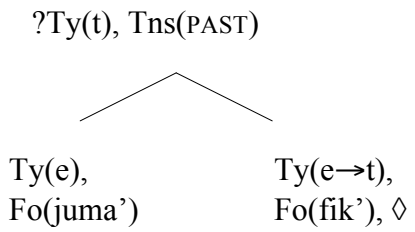
-*fik*-	IF	?Ty(e→t)
	THEN	go(⟨↑$_1$⟩); make(⟨↓$_0$⟩); go(⟨↓$_0$⟩); put(Fo(**U**), Ty(e), ?∃x.Fo(x)); go(⟨↑$_0$⟩); make(⟨↓$_1$⟩); go(⟨↓$_1$⟩); put(Fo(fik'), (Ty(e→t)))
	ELSE	abort

As can be seen on examination of the lexical entry shown above, the trigger for parsing the verb stem is a ?Ty(e→t) node. The lexical actions induce the re-construction of an argument node annotated with the metavariable Fo(**U**) and the requirement that this metavariable receives interpretation before the parse is complete (?∃x.Fo(x)). Since in the derivation currently under discussion the subject

[60] This will be shown to be the case for Rangi, particularly in auxiliary constructions where the building and re-building of structure is central to the analysis proposed in Chapters 5 and 6.

node already exists and is decorated with Fo(juma'), the newly introduced subject node collapses with the subject node already present in the tree. The verb stem also induces the construction of a Ty(e→t) node which collapses with the predicate node already present in the tree. However, the verb introduces the formula value Fo(fik'), enabling the update of the predicate node to a full formula value. Parsing the verb stem -*fik*- results in the partial tree structure shown in (411) below.

(411) Parsing: *a-li-fik-…*



The final vowel is the last element in the verbal template to be parsed. The Dynamic Syntax analysis of TAM suffixes in head-final languages such as Japanese (Cann et al. 2005b:240) and Korean (Kiaer 2007), is that the final suffix encodes some restriction on the completion of the tree. However, in head-initial Bantu languages, where the object typically follows the verb, an analysis under which the final vowel is required for the completion of the tree is not appropriate since the object still remains to be processed when the final vowel is parsed. Marten and Kula (2011) therefore propose that for Bantu languages, the final vowel relates to the completion of the valency-altering operations that are encoded in the derivational verbal extensions. The observation is that all argument nodes have to be built, although not all of them have to be decorated, by the time the final vowel is parsed. Since the verbal template is responsible for the construction of the predicate frame, the final vowel indicates that this has been done.

I propose that for Rangi, parsing the final vowel -*a* indicates that no further addition of predicate-argument structure is licensed. This is achieved through adding the bottom restriction to the predicate node and inducing the movement of the pointer from the predicate node to the argument node. This has the desired effect of

prohibiting the construction of any further predicate nodes since the pointer is already at the argument node. The lexical entry for the final vowel *-a* which encodes this set of lexical actions is shown in (412) below.

(412) Lexical entry for the final vowel *-a*

-a	IF	?Ty(e*→t)
	THEN	$\text{golast}_{\downarrow}$(e*→t), put [↓]⊥, go(⟨↑$_1$⟩), go(⟨↓$_0$⟩)
	ELSE	abort

As can be seen on examination of the lexical entry above, the final vowel *-a* has a ?Ty(e*→t) node as its lexical trigger. The asterisk (*) indicates that the number of type *e* terms may be one or more since the final vowel *-a* is suffixed onto verb stems of various valencies. In the presence of a predicate node, parsing the final vowel induces the movement of the pointer to the last (bottom most) Ty(e*→t) node. From this node the pointer moves up one predicate node and down one predicate node to the bottom most argument node. The movement of the pointer to the argument node has the desired impact of prohibiting the construction of further predicate structure. If an object argument is present in the derivation, the presence of the pointer at the argument node also enables the parsing of the object expression and the annotation of the object node with the information made available by the object NP.

The lexical entry for transitive verbs includes a lexical statement which moves the pointer to the object node in preparation for the parsing of the object. On the basis of such an assumption the lexical entry outlined above for the final vowel would be rendered both ineffective and impossible since the pointer is not at a predicate node when the final vowel is parsed. In order to be able to pursue this analysis for the final vowel, I propose that in the case of transitive predicates the object node is built immediately after the construction of the Ty(e→t) node, with the Ty(e→(e→t)) being built after that. The pointer is then at the Ty(e→(e→t)) node when the final vowel is parsed and can subsequently move to the argument node. Such a proposal necessitates a reworking of the lexical entry for verbs so that the order of the lexical actions which induce the construction of the predicate nodes is changed. The lexical

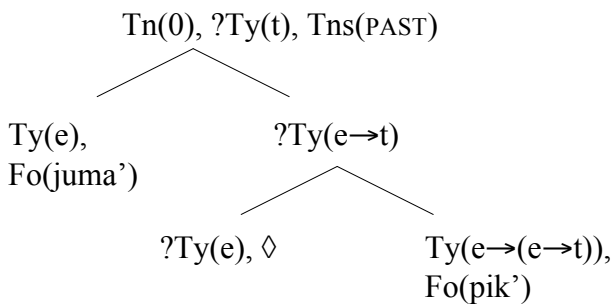
entry for the Swahili transitive verb stem *-pik-* 'cook', in which the object node is built before the transitive predicate node, is shown in (413) below.

(413) Lexical entry for the verb stem *-pik-* 'cook'

-pik-	IF	?Ty(e→t)
	THEN	go(⟨↑$_1$⟩); make(⟨↓$_0$⟩); go(⟨↓$_0$⟩); put(Ty(e), Fo(**U**), ?∃x.Fo(x)); go(⟨↑$_0$⟩); make(⟨↓$_1$⟩); go(⟨↓$_1$⟩); put(Fo(pik')); make(⟨↓$_0$⟩); go(⟨↓$_0$⟩); put(?Ty(e)); go(⟨↑$_0$⟩); make(⟨↓$_1$⟩); go(⟨↓$_1$⟩); put(Fo(pik'), Ty(e→(e→t)));
	ELSE	abort

Under such an analysis, the verb stem still has a requirement for a predicate node as its lexical trigger. The lexical actions induced result in the construction of a fixed subject node and a fixed predicate node. In inflected verb forms these will collapse with the fixed subject and predicate node already introduced by the tense-aspect marker. The lexical actions encoded in the verb stem will then induce the construction of a ?Ty(e) object node and the Ty(e→(e→t)) predicate node. With the pointer at the predicate node, parsing the final vowel moves the pointer to the object argument node, prohibiting the construction of any additional predicate structure.[61] The resulting tree can be seen in (415) below.

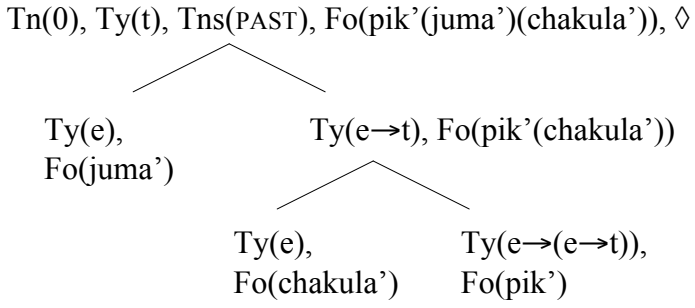
(414) Parsing: *Juma alipika…*



With the pointer at the ?Ty(e) object node, parsing the object expression *chakula* 'food' provides the decoration for the object node. With all of the requirements satisfied the derivation is complete as can be seen in the tree in (415) below.

[61] This will also be the analysis which I pursue for transitive verbs in Rangi as will be seen in section 4.9.3.

(415) Parsing: *Juma alipika chakula*



I adopt this analysis despite the extensive debate over the status of 'object' arguments in Bantu. Whilst Schadeberg (1995) proposes a set of objecthood tests for Bantu, Thwala (2006) claims that these diagnostics are not necessary nor sufficient conditions for objecthood and as such are unreliable diagnostics. Furthermore, noted by both Thwala (2006) and Schadeberg (1995) is the fact that these diagnostics are not in themselves related to objecthood. Since the discussion of the exact nature of the 'object' argument in Bantu is beyond the scope of the current study, I claim only that the analysis presented above for object arguments and object markers is based on the widely understood notion of 'object' and does not attempt to provide an analysis or definition of what such an entity entails.

Transitive predicates may also contain an object marker, with object agreement widespread throughout Bantu. There is cross-linguistic variation between languages as to the contexts in which an object marker is permissible, obligatory and prohibited. In Swahili, an object marker is obligatory when the object argument which is being cross-referenced is animate. In other contexts in Swahili, the inclusion of an object marker is motivated by considerations of semantics (e.g. definiteness) and/or information structure (e.g. topicality). In Sambaa, object marking is generally morpho-syntactically optional, but object markers are required with personal names, some kinship terms and the questions word *ndayi* 'who' (Riedel 2009). In the Kivunjo dialect of Chaga, object marking is required if the

object NP is a lexical pronoun (Bresnan and Moshi 1990), whilst at the other end of the spectrum, object marking does not appear to be obligatory in Bemba (Marten et al. 2007).

The analysis provided in the section above for the subject marker in Swahili is one in which the subject marker induces the construction of a locally unfixed node, decorated with a metavariable formula value without updating the structural relation. Both subject and object markers comprise a closed set of morphemes that occur in a unique morphological position, in which no other elements are found. The object marker can be assumed to function in a similar way to the subject marker, and is also responsible for the projection of a locally unfixed node which is annotated with a restricted metavariable annotation determined by the noun class of the object marker. The projection of the object marker onto a locally unfixed node means that the subject information must also necessarily have received a fixed tree node address by this stage in the derivation. This correctly predicts ungrammaticality in instances in which a subject marker is immediately followed by an object marker, i.e. without an intervening slot 3 tense-aspect marker.[62]

I assume that an object marker projects a locally unfixed node annotated with a restricted metavariable. I also analyse the object marker as licensing the construction of a Ty(e→(e→t)) node and a ?Ty(e) object node in order to reflect the expectation (and associated restriction), on parsing an object marker, that the predicate contains an object. The lexical entry for the Swahili class 1 object marker is shown in (416) below.

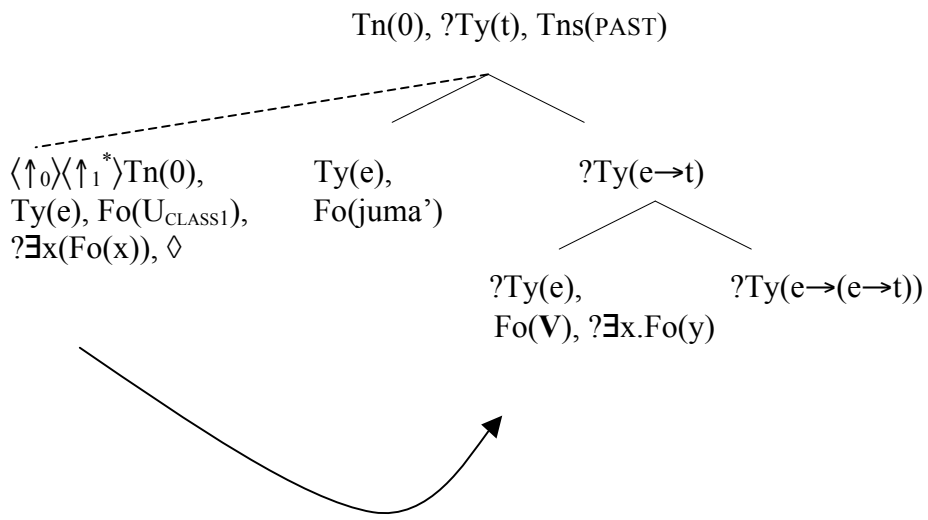
[62] An exception to this generalisation is provided by infinitive and subjunctive forms, in which a subject marker may be immediately followed by an object marker.

(416) Lexical entry for class 1 object marker *-mw-*

-mw-	IF	?Ty(e→t)
	THEN	go(⟨↑$_1$⟩); make(⟨↓$_0$⟩⟨↓$_1^*$⟩); go(⟨↓$_0$⟩⟨↓$_1^*$⟩); put(?Ty(e), Fo(U$_{\text{CLASS1}}$), ?∃x.Fo(x)); go(⟨↑$_1^*$⟩⟨↑$_0$⟩); go(⟨↓$_1$⟩); make(⟨↓$_1$⟩); go(⟨↓$_1$⟩); put(?Ty(e→(e→t)); go(⟨↑$_1$⟩); make(⟨↓$_0$⟩); go(⟨↓$_0$⟩); put(Ty(e), Fo(**V**), ?∃x.Fo(y), [↓]⊥)
	ELSE	abort

As can be seen on examination of the IF clause in (416) above, the object marker has a ?Ty(e→t) node as its trigger. The lexical actions induced by the object marker result in the information from the object marker being projected onto a locally unfixed node which is projected from the root node and the construction of a ?Ty(e→(e→t)) node and its corresponding argument node annotated with the metavariable (Fo(**V**)). The object argument node receives immediate interpretation from the restricted metavariable encoded by the object marker on the unfixed node. The tree showing the projection of the locally unfixed node annotated with the object information and the construction of the object node can be seen in (417) below.

(417) Parsing: *Juma a-li-mw…*



The unfixed node analysis for object markers can also be used to capture a number of the syntactic restrictions exhibited by object markers. In certain languages, object

markers can only occur without the presence of a co-referring object NP in which case, from the DS perspective, the object marker encodes a bottom restriction. The *ADJUNCTION analysis is able to capture this restriction, since the execution of this computational rule is not dependent on specific semantic information being made available within the parse. The unfixed node analysis is able to capture the prohibition of the co-occurrence of more than one object marker in a verb form since two unfixed nodes of the same modality cannot co-exist. Although there are Bantu languages which permit more than one object marker to be present in a verb form, this restriction on the co-occurrence of object markers is necessary for Swahili (and for Rangi) where only one object marker can be present in a verb form. In those languages which permit multiple object markers, an alternative analysis, involving the construction of a LINK structure or a LINK structure in conjunction with an unfixed node, may be pursued.

Modelling the reflexive marker *-ji-* in a similar manner as the object marker can also be used to formally capture the preclusion of the co-occurrence of an object marker and the reflexive marker. Since both the object marker and the reflexive marker are analysed as projecting a locally unfixed node, the restriction on the co-occurrence of two locally unfixed nodes also acts to prohibit the construction of both a reflexive marker and an object marker at the same time. The restriction on more than one object marker is also extended to the restriction on passive and locative inversion to which object markers are also generally precluded.[63]

To summarise, the sequence of actions involved in parsing a basic Swahili string can be seen to involve the establishment of local argument nodes which unify with the template provided by the tense marker and the verb. This takes place against a background of information available from context. In Swahili, the verb alone can be responsible for the establishment of a fully decorated binary-branching semantic tree representative of propositional structure. The projection of this propositional

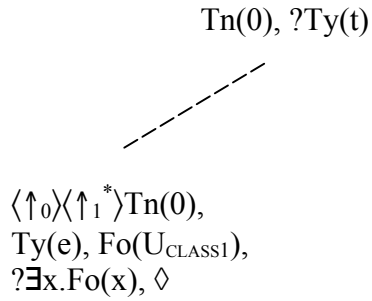
[63] Although see also Woolford (1995; 2001) and Marten et al. (2007) for counter-examples to this generalisation.

structure involves interplay between the subject marker, tense-aspect marker, object marker (when present) and the verb stem. The final default vowel -*a* is taken to indicate that the entire predicate-argument structure has been established and that no more valency-altering processes can take place. Drawing on the discussion presented thus far of analyses provided for Swahili, the next sub-section provides a step-by-step discussion of a sample derivation for the Swahili phrase *alifika* 's/he arrived'.

4.9.2 Sample Swahili derivation: Parsing *alifika*

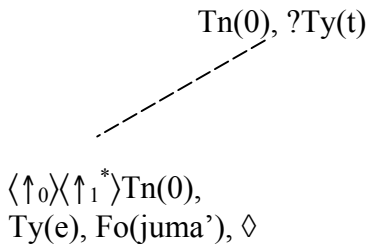
The subject marker is projected onto a locally unfixed node introduced to the derivation by the rule of LOCAL *ADJUNCTION. The subject marker projects a restricted metavariable onto the locally unfixed node, restricting the possible substituents for the metavariable to class 1 ($Fo(U_{class1})$). The resulting tree can be seen in (418) below.

(418) Parsing: *a-*



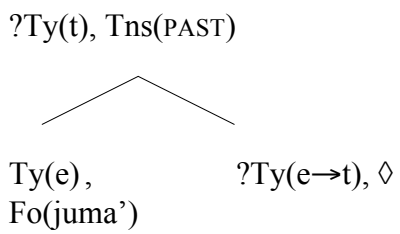
If an overt subject NP were present, this would provide the background against which the metavariable could receive interpretation. Since this is an example of subject pro-drop however, the metavariable receives interpretation from context and an appropriate substitute (from class 1) – such as *Juma* – is recovered from the context. This can be seen in (419) below.

(419) Parsing: *a-...*



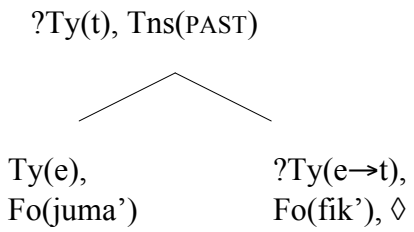
Parsing the past tense marker *-li-* introduces the past tense interpretation to the clause. This is represented by the diacritic Tns(PAST) at the root node. The past tense marker also introduces a fixed subject node and a fixed predicate node, both of which are annotated with metavariable placeholders. In the presence of a fixed subject-requiring node, the unfixed node hosting the subject information is able to receive a fixed tree node address and is fixed as the logical subject of the clause. This tree that results is shown in (420) below.

(420) Parsing: *a-li-...*



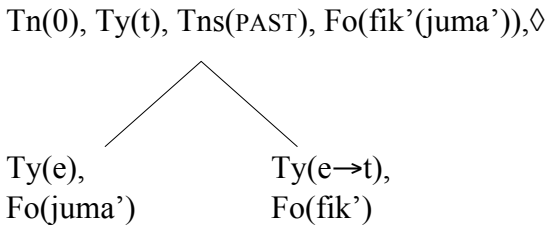
Parsing the verb stem also results in the projection of a fixed subject node and a fixed predicate node. This structure collapses with the fixed structure, which has already been induced by parsing the past tense marker. In the case of a transitive predicate, parsing the verb stem results in the construction of a ?Ty(e→(e→t)) node and an object node, in addition to the minimal predicate-argument structure introduced by the past tense marker. In the current derivation however, since *-fika* 'arrive' is being used intransitively, the fixed structure induced by parsing the verb stem collapses with the minimal structure built by the past tense marker. The resulting tree is shown in (421) below.

(421) Parsing: *a-li-fik-…*



As can be seen above, in addition to building structure, the lexical actions induced by the verb stem provide the full formula value annotation for the predicate node. Parsing the final vowel indicates that no further predicate-argument structure can be introduced after this point. With all the requirements fulfilled, the accumulated information is compiled up the tree. The final propositional formula is derived as a decoration on the top node, with the type *t* requirement satisfied. A snapshot of the final stage in the derivation, with all of the requirements fulfilled, can be seen in (422) below.

(422) Parsing: *a-li-fik-a*



The sample derivation provided above for the Swahili phrases *alifika* 's/he arrived' follows on from previous analyses of Swahili clause structure. The basic assumptions have been that the Bantu verbal structure makes a lexically specified contribution to tree development. Whilst the subject marker projects a metavariable which can be resolved from context (whether or not there is an overt lexical subject), tense markers project minimal predicate-argument structure and introduce temporal information. The verb provides the conceptual information about the predicate, leads to the construction of predicate-argument structure and, in the case of transitive verbs, licenses the building of an object node. The next section will focus on the considerations for the formal analysis of Rangi and the assumptions that are made in this thesis for modelling Rangi clause structure. The principles and assumptions introduced in section 4.9.3 below provide the backdrop for the formal modelling of Rangi auxiliary constructions which are taken up in Chapters 5 and 6.

4.9.3 Considerations for Rangi

The modelling of Swahili clause structure using Dynamic Syntax and the sample Swahili derivation presented in section 4.9.1, follow on from previous analyses of

Bantu languages, particularly of Swahili. Building on this base, the current section focuses on aspects central to the analysis of Rangi clause structure, highlighting the ways in which they deviate from and are similar to previous analyses of other Bantu languages. In so doing, this section lays the theoretical foundation for the analyses of the Rangi infinitive-auxiliary constructions and the alternation contexts which comprises the foci of Chapter 5 and Chapter 6 respectively.

Rangi has morphologically complex verbs and nouns and a basic SVO order, which allows for some flexibility of constituent order. Lexical subjects and objects are referenced on the verb by agreement markers. In the appropriate context, overt NPs can be omitted, and the inflected verb can function as a complete utterance independent of any other element. The structural possibilities made available in the parsing/production process for the Swahili verbal template are therefore also, to a large extent, applicable to Rangi.

The current section will show that, unlike the analysis provided for the subject marker in Swahili, I analyse the subject marker in Rangi as responsible for the introduction of a locally unfixed node, not merely for the annotation of a locally unfixed node introduced via the rule of LOCAL *ADJUNCTION. However, similarly to Swahili, I analyse Rangi pre-stem TA markers as responsible for the introduction of fixed predicate-argument structure. I also propose that the lexical trigger for parsing verbs in Rangi is a ?Ty(e→t) node. In order to account for the establishment of structure from verbs of varying valencies, an underspecification approach is adopted to the contribution made by verb stems. Under this approach verb stems introduce Ty(e*→t) nodes. The eventual valency of these Ty(e*→t) nodes, and their associated structure, are enriched through context and in conjunction with the valency-alternating verbal extensions.[64]

[64] For more on verbal underspecification of this type and its use within the DS framework, see Marten (2002).

I model Rangi initial subject NPs (when present) as annotating a LINK structure introduced into the derivation via the computation rule of LINK ADJUNCTION. LINK structures allow for the construction of an independent tree in parallel with the main tree, with the requirement for some information to be shared by both trees. The information provided by the subject expression annotates this parallel tree, providing a context against which the subsequent subject information – the subject marker – can be interpreted. In contrast to the analysis provided for Swahili, I adopt an analysis for Rangi under which I assume that the rules of INTRODUCTION and PREDICTION do not apply, and as such, that they are not available cross-linguistically. In the case of Rangi, this proposal is motivated by a desire to restrict the contexts in which a NP can be parsed by ensuring that the necessary tree structure is built by lexical rules rather than by generalised computational rules.

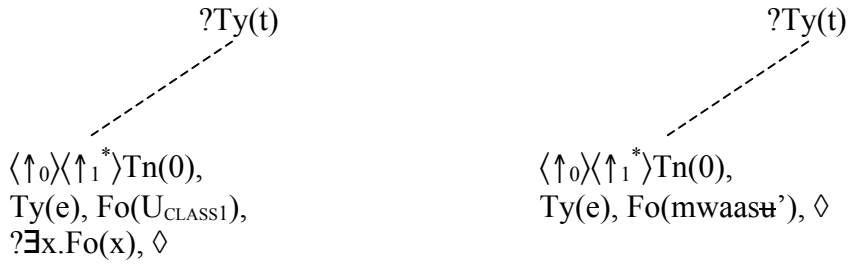
I analyse the subject marker in Rangi as responsible for the projection of a locally unfixed node. Whilst this analysis differs from that provided for Swahili, under which the rule of LOCAL *ADJUNCTION is taken to introduce the unfixed node, it is similar to the analyses proposed by Kempson et al. (2011b) for SiSwati and Marten and Kula (2011) for Bemba. It also follows the analyses which have been provided for object clitics in Romance languages and a number of dialects of Modern Greek (Chatzikyriakidis 2010). The proposal that the subject marker itself is responsible for the introduction of the unfixed node comes from the desire to restrict the reliance on generalised transition rules in the establishment of propositional structure. This restriction further prohibits full lexical NPs from decorating locally unfixed nodes which would be possible under the LOCAL *ADJUNCTION analysis. The lexical entry I propose for the Rangi class 1 subject marker *a- is* shown in (423) below.

(423) Lexical entry for Rangi subject marker *a-*

a-	IF	$?Ty(t), \langle\downarrow^{*}\rangle\bot$
	THEN	$make(\langle\downarrow_1{}^{*}\rangle\langle\downarrow_0\rangle), go(\langle\downarrow_1{}^{*}\rangle\langle\downarrow_0\rangle),$
		$put(Ty(e), Fo(U_{CLASS1}), ?\exists x.Fo(x))$
	ELSE	abort

The lexical trigger for parsing the subject marker is the requirement for a propositional expression and the absence of any fixed structure – represented by ($\langle\downarrow^*\rangle\bot$). This ensures that the subject marker is the first element in the verbal template and reflects the ungrammaticality of the placement of the subject marker after the tense-aspect marker. The lexical actions encoded by the subject marker induce the construction of a locally unfixed node annotated with a pronominal metavariable. The interpretation of the metavariable for the class 1 subject marker is restricted to class 1 nouns – represented by Fo(U_{CLASS1}). The structure which parsing a subject marker projects can be seen on comparison of the trees in (424) below, which also shows the substitution of the metavariable with the full formula value Fo(mwaas~~u~~').

(424)



As can be seen on examination of the tree above, the metavariable on the unfixed node is immediately substituted with a full formula value in accordance with the appropriate restrictions – in this case, a class 1 noun. The metavariable projected onto the locally unfixed node is substituted with a full formula value which adheres to this restriction such as Fo(mwaas~~u~~') which is recovered from context.

Rangi tense and aspect distinctions are encoded primarily through morphological markers that appear in either the pre-stem position (slot 3) or the post-stem position (slot 7) within the verbal template. I analyse tense-aspect markers in Rangi as contributing temporal and/or aspectual information as well as being responsible for the introduction of fixed minimal predicate-argument structure. This is similar to the analysis which has been provided for tense-aspect markers in other Bantu languages (see Marten (2002) for Swahili; Marten and Kula (2011) for Bemba).

Such an analysis is justified on the grounds that all simplex verb forms in Rangi contain a tense-aspect marker in the pre-stem slot 3 position. The introduction of predicate-argument structure into the derivation by these tense-aspect markers further reflects the probable historical origin of these tense-aspect markers as bleached auxiliaries (Botne 1989; Nurse 2008; Kempson et al. 2011b:31). The same has been proposed for Rangi, where it is has been suggested that the TAM morpheme -*too*- is derived from the verb -*ita* 'go' and that the iterative marker -*ndo*- for example, is derived from the verb *keenda* 'go' (Stegen 2006). The lexical entry for the progressive marker -*íyó*-, showing the lexical actions it induces, is provided in (425) below.

(425) lexical entry for the progressive marker -*íyó*-

-*iyo*-	IF	?Ty(t), $\langle\downarrow^{*}\rangle\bot\ \langle\downarrow_{1}{}^{*}\rangle\langle\downarrow_{0}\rangle$Ty(e)
	THEN	put(Asp(PROG)); make($\langle\downarrow_{0}\rangle$); go($\langle\downarrow_{0}\rangle$); put(?Ty(e)); go($\langle\uparrow_{0}\rangle$); make($\langle\downarrow_{1}\rangle$); go($\langle\downarrow_{1}\rangle$); put(?Ty(e→t))
	ELSE	abort

As can be seen on examination of the lexical entry shown above, I analyse the trigger for parsing a Rangi pre-stem tense-aspect marker as the requirement for a type *t* node and the presence of a locally unfixed Ty(e) node ($\langle\uparrow_{0}\rangle\langle\uparrow_{1}{}^{*}\rangle$Ty(t)). The requirement that there is no fixed structure present in the tree ensures that -*íyó*- is parsed after the subject marker but before the verb stem, since I analyse verb stems as responsible for the introduction of fixed predicate-argument structure. The lexical actions induced by the progressive marker -*íyó*- result in the annotation of the root node with the progressive aspectual information Asp(PROG), and the construction of a fixed subject node and a fixed predicate node.

In addition to the specific tense-aspect prefixes -*íyó*-, -*ka*- and -*áá*-, a number of other conjugations in Rangi use a combination of information in the slot 3 position and the slot 7 position to encode tense-aspect distinctions. In a number of these instances, this marker in the slot 3 position is -*a*-. This can be seen on examination of Table 21 below.

Table 21: Rangi conjugations using slot 3 and 7

Tense	**Form**
General present	SM-a-H-a
Habitual	SM-a-V-aa
Perfective	SM-a-H-ire
Recent past	SM-á-H-iré
Recent past progressive	SM-áá-H-a
Recent past habitual	SM-á-V-áa
Distant past	SM-a-V-á

In order to account for the complexities of the Rangi data, it is proposed here that the morpheme *-a-* in the slot 3 position is responsible for the introduction of a tense-aspect interpretation which is non-future. This analysis is extended only to the low tone prefix *-a-*. Although the slot 3 marker *-a-* is therefore not responsible for the introduction of a specific tense or aspect interpretation, it reduces the possible interpretations that the eventual clause can have, restricting the interpretation of the clause to non-future. In addition to this restriction, I also analyse *-a-* as responsible for the introduction of fixed minimal predicate-argument structure. The incorporation of original strings of inflected auxiliary plus infinitive, or inflected auxiliary plus inflected main verb has been described as the 'most productive source for categorical and morphemic change' in Bantu verb structure (Nurse 2008:59). Whilst the presence of the pre-stem *-a-* no longer encodes a specific interpretation, the analysis I propose reflects the probable origins of the pre-stem *-a-* in one of these auxiliary-infinitive constructions or auxiliary-inflected verb constructions. The lexical entry for the prefix *a-*, which can therefore be seen to function similarly to other slot 3 tense-aspect markers, is provided in (426) below.

(426) lexical entry for slot 3 prefix *-a-*

-a- IF ?Ty(t), $\langle\downarrow_1{}^*\rangle\langle\downarrow_0\rangle$Ty(e)
THEN put(Tns(NON-FUTURE)); make($\langle\downarrow_0\rangle$); go($\langle\downarrow_0\rangle$); put(?Ty(e));
go($\langle\uparrow_0\rangle$); make($\langle\downarrow_1\rangle$); go($\langle\downarrow_1\rangle$); put(?Ty(e→t))
ELSE abort

As was also seen for the progressive marker -*íyó*-, the trigger for the prefix -*a*- is a locally unfixed node. The lexical actions induced by -*a*- result in the introduction of the non-future tense restriction into the clause and the construction of a fixed subject node and a fixed predicate node.

I propose that the pre-stem marker -*á*- also builds a fixed subject node and a fixed predicate node. However, since its occurrence is restricted to the recent past I analyse it as also introducing a recent past tense interpretation. I further analyse the tone on the verb stem as contributing to the eventual tense interpretation of the utterance. The Rangi verb stem carries a high tone in all tense-aspect combinations except for the distant past, the recent past habitual and the distant past habitual. In order to capture this distinction I propose that in instances in which the verb stem carries a low tone this introduces a restriction on the tense interpretation of the clause to one of past tense ?Tns(PAST). In the case of the distant past this will be fulfilled upon parsing of the distant past suffix -*á*, which is encountered after the verb stem. In the case of the recent past habitual, the past tense has already been encoded by the prefix *á*- by the time the verb stem has been encountered. I therefore propose that the prefix *á*- introduces the recent past tense interpretation and that this satisfies the past tense restriction as soon as it is introduced by the verb stem. The same is true for the distant past habitual, with the past tense interpretation being introduced by the past tense auxiliary -*íja* before the verb is parsed.

In addition to the slot 3 tense-aspect markers, a number of Bantu languages use tense-aspect markers in the slot 7 position to encode temporal and aspectual distinctions. This has particularly been noted for perfective verb forms which are often constructed using a suffix e.g. -*ile* in Bemba (Nurse 2008).[65] Such tense-aspect suffixes pose a challenge for the DS approach to Bantu clause structure since the framework takes an incremental approach to the establishment of meaning, relying on the notion of on-line choices that are made in relation to the contribution of a

[65] Nurse (2006) proposes the reconstruction *-*ile* for anterior or perfective aspect in Proto-Bantu.

particular piece of information. With the analysis of the verbal template dependent on the pre-stem tense-aspect markers introducing the fixed predicate-argument structure, the tense-aspect suffix means that no fixed predicate-argument structure is introduced into the derivation prior to the parsing of the verb stem. This poses a challenge for those languages in which the lexical trigger for verbs is ?Ty(e→t) and, as such, dependent upon the introduction of fixed predicate-argument structure by the pre-stem tense aspect marker.

In order to tackle the challenge to the analysis presented by the perfect suffixes such as -*ile* in Bemba (and across Bantu), Marten and Kula (2011) propose that these cases license the establishment of structure which anticipates specific tense information. In other words, the building of a fixed subject node and a fixed predicate node is licensed after the subject marker has been parsed, but the ability to do this is subject to a requirement at the root node that the interpretation of the clause is perfect. For Bemba, the requirement that the tense be perfect (?Tns(PERF)), is fulfilled when the perfect suffix -*ile* is parsed. Upon parsing the perfect suffix -*ile*, the partial tree can therefore either be further developed or completed since the tense requirement has been satisfied. As with all other requirements, if the tense requirement is not satisfied, the derivation fails. The anticipatory building of structure is therefore restricted to the perfect verb forms in which tense marking appears after the verb root.

Positing that the pre-stem marker -*a*- results in the projection of fixed minimal predicate argument structure in Rangi means that tense-aspect suffixes do not pose a challenge to the DS modelling of Rangi. Since the pre-stem -*a*- introduces a ?Ty(e→t) node, by the time the verb stem is parsed, fixed structure is already present in the tree under construction. In terms of the temporal and/or aspectual interpretation of the clause, -*a*- introduces a ?Tns(NON-FUTURE) restriction. The enrichment of this restriction can occur upon parsing the suffix. Unlike slot 3 tense-aspect markers however, I do not analyse the tense-aspect suffixes as introducing fixed predicate-argument structure. However, they do have an additional function in

that they indicate that the end of the verbal template has been reached and that no more predicate structure can be introduced after this stage. I therefore analyse the slot 7 tense-aspect suffixes as moving the pointer from the lowest predicate node to its associated argument node in a way similar to the final vowel -*a*, indicating that no more predicate or argument nodes can be constructed. The lexical entry for the perfective suffix -*ire* is shown in (427) below.

(427) Lexical entry for the perfective suffix -*ire*

-*ire*	IF	?Ty(e*→t)
	THEN	go($\langle\uparrow_1{}^*\rangle$); put(Asp(PERFTIVE)); golast$_\downarrow$(e*→t); put([↓]⊥); go($\langle\uparrow_1\rangle$); go($\langle\downarrow_0\rangle$)
	ELSE	abort

The suffix -*ire* therefore has a ?Ty(e*→t) node as its lexical trigger. This analysis is not dependent on presupposing a step of COMPLETION (as would be the case if the trigger for -*ire* was taken as ?Ty(t)). The use of the underspecified argument e* reflects the fact that such suffixes can appear after predicates of any valency and also after the valency-altering suffixes. The lexical actions induced by parsing -*ire* result in the introduction of the perfective aspect to the clause and the movement of the pointer to the last argument node, indicating that no further predicate nodes can be constructed.

The analysis developed here for Rangi is therefore one under which slot 3 tense-aspect markers result in the construction of minimal predicate-argument structure and, in the case of the specific tense-aspect markers, make a temporal or aspectual contribution to the clause. In instances in which the specific tense-aspect information is encoded solely through a slot 7 suffix, the slot 3 marker -*a*- licenses the construction of fixed predicate structure and introduces a restriction on the interpretation of the clause to non-future, whilst the specific tense-aspect reading of the clause is delayed until a suffix, such as -*ire*, is parsed.

I analyse the Rangi verb stem as responsible for the introduction of the lexcio-semantic contribution of the predicate to the derivation as well as the construction of

a fixed predicate node and a fixed subject node. With the slot 3 tense-aspect marker analysed as introducing minimal fixed predicate structure, I analyse the lexical trigger for Rangi verb stems in inflected verb forms as a ?Ty(e→t) node. One of the effects of this is that the subject and predicate nodes are built twice. Since the annotations of these two do not conflict however, they collapse as their tree node addresses are identical. This analysis is that same as that provided for verb stems in Swahili (see Cann et al. (2005b:305) and Marten (2005)).

The analysis I provide differs from that provided for Romance languages and dialects of Modern Greek in which the trigger for verbs is taken to be ?Ty(t). This difference reflects the different roles performed by the verbs in these different languages and language families. In Bantu languages, if the tense-aspect marker is considered to be responsible for the construction of the predicate node, the verb can have a ?Ty(e→t) trigger since the predicate-requiring node has already been introduced into the semantic tree by the time the verb is parsed. In a language in which this is not the case however, the verb is analysed as having a lexical trigger of ?Ty(t), as is the case for Romance languages. The lexical entry for the Rangi verb stem *-terek-* 'cook' is shown in the lexical entry in (428) below.

(428) Lexical entry for the verb *-terek-*

-terek-	IF	?Ty(e→t)
	THEN	go(⟨↑$_1$⟩); make(⟨↓$_0$⟩); go(⟨↓$_0$⟩); put(Ty(e), Fo(**U**), ?∃x.Fo(x)); go(⟨↑$_0$⟩); make(⟨↓$_1$⟩); go(⟨↓$_1$⟩); put(?Ty(e→t)); make(⟨↓$_0$⟩); go(⟨↓$_0$⟩); put(?Ty(e)); go(⟨↑$_0$⟩); make(⟨↓$_1$⟩); go(⟨↓$_1$⟩); put(?Ty(e→(e→t)), Fo(terek')),
	ELSE	abort

As can be seen in the lexical entry above, the lexical trigger for verbs in Rangi is a ?Ty(e→t) node. The lexical actions induced by the verb then result in the construction of a fixed subject node and a fixed Ty(e→t) predicate node, a fixed object argument node and a fixed Ty(e→(e→t)) predicate node. In an inflected verb form the slot 3 tense-aspect marker will already have been parsed at the point in the derivation at which the verb stem is parsed. The subject node and predicate node

introduced by the verb stem collapse with the minimal predicate-argument structure already introduced by the tense-aspect marker. In the case of a transitive predicate such as *tereka*, the construction of an object node and a ?Ty(e→(e→t)) predicate node are also licensed. Parsing the final vowel moves the pointer from the predicate node to the object node, prohibiting the construction of any further structure.

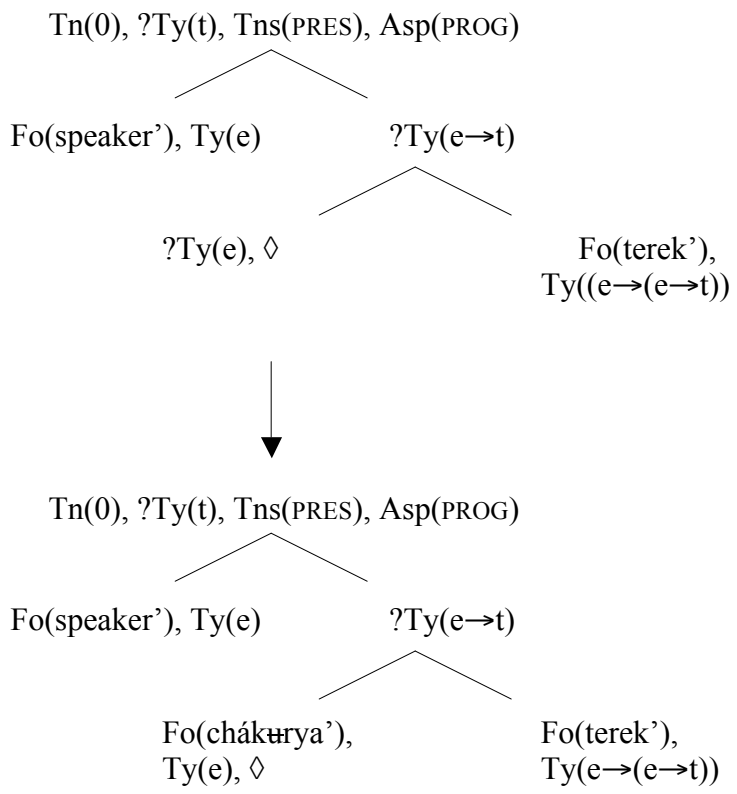
The analysis of Rangi clause structure outlined thus far is based on the possibility of building the same structure twice. Not only is the construction and re-construction of fixed structure permissible within DS, the availability of this strategy is central to the analysis since multiple elements in the verb stem may induce the same structure. Such an analysis is necessary since, although the morphemes always appear in a set order, not all morphemes are present in any given verb form. In order to ensure the establishment of appropriate structure in all verb forms, there are instances in which the same structure is built more than once. This is the case with verb stems which are prefixed by a pre-stem tense-aspect marker – both of which are analysed as projecting a fixed subject node and a fixed predicate node. The analysis that I propose for modelling Rangi clause structure makes explicit use of the building and re-building structure which is possible within DS.

I analyse the Rangi verb as having a ?Ty(e→t) trigger. Such an analysis is motivated by the fact that verb stems in Rangi are consistently prefixed by a pre-stem tense-aspect marker. Since I analyse pre-stem tense-aspect markers as responsible for the introduction of a fixed subject node and a fixed predicate node, at the point at which the verb stem is parsed a predicate node annotated with ?Ty(e→t) is already present in the tree under development. In a language which does not make consistent use of pre-stem markers, such an analysis would not be tenable since the ?Ty(e→t) predicate node would not be present in the tree by the point at which the verb stem is parsed. Further motivation for the ?Ty(e→t) trigger for Rangi verb stems comes from the use of the pre-stem marker -*a*- which appears in a number of different tense-aspect combinations in Rangi. I analyse this marker as responsible for the introduction of a non-future reading since it can appear in a number of different

tenses but cannot appear is the future tense (see the lexical entry in (426) above). The retention of this semantically weak pre-stem marker further motivates the analysis of it as responsible for the introduction of fixed structure since its tense-aspect contribution to the parse appears to be minimal.

With the ?Ty(e) object node introduced by the verb stem, parsing an object argument provides the interpretation from the object argument and subsequent decoration for the object node. This can be seen in the tree for *nóótereka chák~~u~~rya* 'I am cooking food', shown in (429) below, where the second trees show the introduction of the information made available by parsing the object argument.

(429) Parsing: *nóótereka chák~~u~~rya....*



I analyse object markers in Rangi as resulting in the projection of a locally unfixed node and a restricted metavariable. This is similar to the analysis presented in section 4.9.1 above for Swahili. Parsing the object marker also results in the

construction of additional predicate-argument structure since, intuitively, the presence of the object marker implies that the predicate will be (minimally) transitive. This can be seen in the lexical entry for the object marker -*mʉ*- in (430) below.

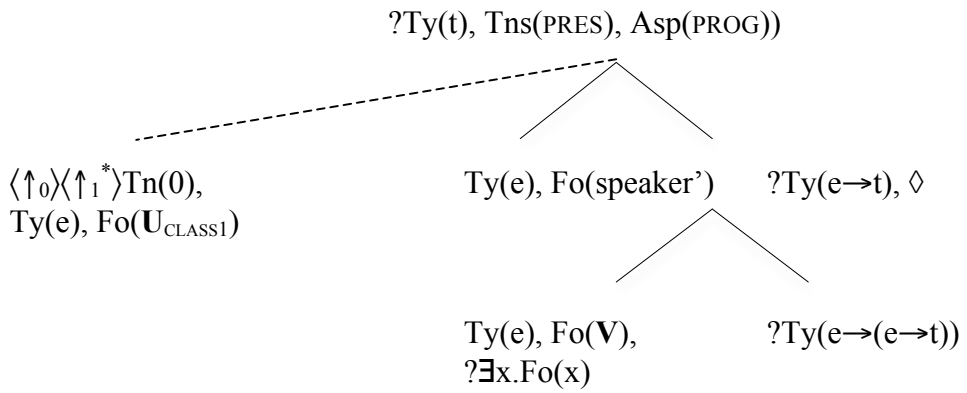
(430) Lexical entry for the object marker -*mʉ*-

-*mʉ*-	IF	?Ty(e→t)
	THEN	go($\langle\uparrow_1\rangle$); make($\langle\downarrow_1{}^*\rangle\langle\downarrow_0\rangle$); go($\langle\downarrow_1{}^*\rangle\langle\downarrow_0\rangle$); put(Fo($\mathbf{U}_{\text{CLASS1}}$)); go($\langle\uparrow_0\rangle\langle\uparrow_1{}^*\rangle$); go($\langle\downarrow_1\rangle$); make($\langle\downarrow_1\rangle$); go($\langle\downarrow_1\rangle$); put(?Ty(e→(e→t))); go($\langle\uparrow_1\rangle$); make($\langle\downarrow_0\rangle$); go($\langle\downarrow_0\rangle$); put(Fo(**V**), Ty(e), ?∃x.Fo(x)); go($\langle\uparrow_0\rangle$)
	ELSE	abort

From a theoretical perspective, the prohibition on the co-occurrence of object markers in Rangi can be accounted for by reference to the fact that object markers are projected onto unfixed nodes. DS prohibits the co-occurrence of two unfixed nodes at any stage within a derivation and as such, two object markers cannot be present in a single verb form.

Parsing the object marker results in the projection of a locally unfixed node annotated with a restricted metavariable. It also results in the construction of a Ty(e→(e→t)) predicate node and a Ty(e) object node. The projection of the unfixed node can be seen in the tree in (431) below.

(431) Parsing: *n-óó-mʉ*...



As can be seen in the partial tree above, the object marker induces the construction of an unfixed node with a metavariable annotation representative of the restriction of the class interpretation upon the object argument referent. The object marker also licenses the construction of a ?Ty(e→(e→t)) node and an object argument node in anticipation of the parsing of the verb stem (which may also include verbal extensions) which will be at least transitive. With the object argument node built, the locally unfixed node annotated with the information provided by the object marker merges with this node.

Parsing the verb stem provides the lexico-semantic information for the annotation of the predicate node. Parsing the final vowel indicates that the predicate-argument structure is complete. Formally, this is achieved by the final vowel inducing pointer movement from the predicate node to the argument node, prohibiting the building of further structure below this. The lexical entry for the Rangi final vowel *-a* is shown in (432) below.

(432) Lexical entry for the final vowel *-a*

-a	IF	?Ty(e*→t)
	THEN	go(⟨↑$_1$⟩); go(⟨↓$_0$⟩)
	ELSE	abort

As can be seen upon examination of the lexical entry above, parsing the final vowel results in the movement of the pointer from a predicate node of unspecified valency to its associated argument node. The next sub-section exemplifies the steps involved in parsing a Rangi clause by way of a sample derivation.

4.9.4 Sample Rangi derivation: *niíni níyótereka chákurya*

Having established the grounds on which the DS analyses are to proceed for Rangi, the current section provides a step-by-step sample derivation of a Rangi utterance. The aim is to illustrate the key elements of the analysis I make for parsing Rangi clauses. The assumptions made include that the subject expression (when present) is parsed onto a LINK structure projected by the rule of LINK ADJUNCTION. The subject marker projects a locally unfixed node annotated with a restricted metavariable

placeholder. Parsing a pre-stem slot 3 tense-aspect marker results in the introduction of temporal or aspectual information into the clause which is represented by a diacritic at the root node. The pre-stem tense-aspect markers are also responsible for the construction of a fixed subject node and a fixed predicate node. The same is true for the pre-stem marker *-a-*, which does not contribute a specific tense-aspect interpretation to the clause but introduces a non-future restriction.

I assume that the verb stem has a ?Ty(e→t) trigger and that parsing the verb results in the (re-)building of a fixed subject node and a fixed predicate node, the extent of which is determined by the valency of the predicate. Since the pre-stem tense-aspect marker will already have introduced a fixed subject node and a fixed predicate node by this stage in the derivation, parsing the verb stem also results in the re-building of this fixed structure. The newly built nodes subsequently collapse with the nodes which have already been introduced. Parsing the final vowel moves the pointer to the lowest object argument node, prohibiting the construction of any further predicate-argument structure. The derivation which follows is of the Rangi utterance shown in example (433) below.

(433) n~~ii~~n~~i~~ n-íyó-térek-a chá-k~~u~~rya
1st sg.PP SM1st sg-PROG-cook-FV 7-food
'I am cooking food'

Following the application of the rule of LINK ADJUNCTION, the NP expression *n~~ii~~n~~i~~* 'I' is projected onto a partial tree connected to the main tree via a LINK construction. The rule of LINK ADJUNCTION introduces a requirement that by the time the derivation is complete, a copy of the head noun *n~~ii~~n~~i~~* is found in the main tree as well as in the parallel LINKed tree. Since *n~~ii~~n~~i~~* is the first person singular personal pronoun, the annotation on the independent tree is Fo(speaker'). In context, this is replaced with an appropriate mental representation of the speaker, e.g. Hannah, as can be seen in (434) below.

(434) Parsing: *n~~íni~~…*

$\langle L \rangle$Tn(0), Fo(hannah'), Ty(e) $\longrightarrow$?Ty(t), ?$\langle\downarrow_*\rangle$Fo(hannah'), Ty(e), ◊

Parsing the first person singular subject marker *n-* on the verb results in the projection of a locally unfixed node annotated with a restricted metavariable, the interpretation of which is restricted to first person singular. With the information on the parallel tree providing a context against which the metavariable can receive interpretation, the unfixed node receives a full formula value annotation.

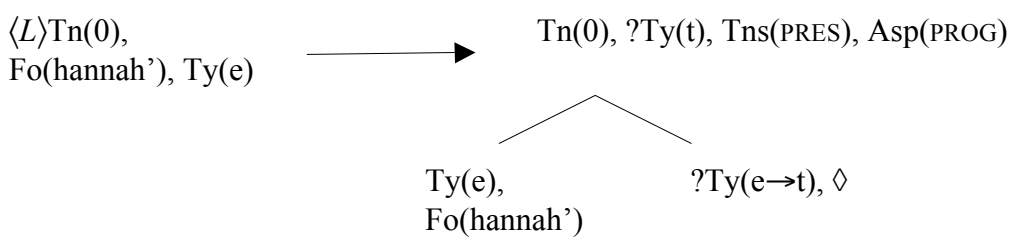
(435) Parsing: *n~~íni~~ n-*

$\langle L \rangle$Tn(0), Fo(hannah'), Ty(e) $\longrightarrow$ Tn(0), ?Ty(t), ?$\langle\downarrow_*\rangle$Fo(hannah')

$\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$Tn(0), Ty(e), Fo(hannah'), ◊

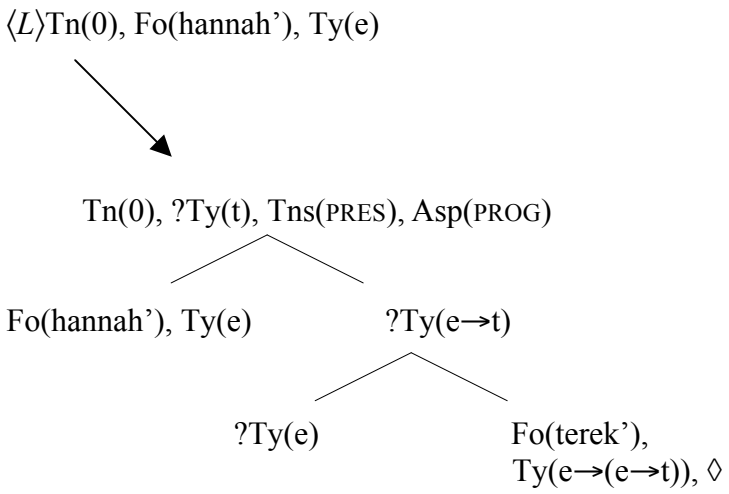
Parsing the progressive tense marker *-íyó-* results in the construction of a fixed subject node and a fixed predicate node and introduces the tense-aspect interpretation into the clause. The temporal and aspectual information is represented by the annotations (Tns(PRES)) and (Aps(PROG)) at the root node. The presence of the fixed subject node enables the establishment of a fixed tree node address for the subject information. The tree structure that results from these lexical actions is shown in (436) below.

(436) Parsing: *n~~ɨ~~ní~~ɨ~~ níyó…*



Parsing the verb stem also results in the projection of a fixed subject node and a fixed predicate node. The predicate structure introduced by the verb stem collapses with the minimal structure introduced by the progressive marker -*íyó*-. Since *tereka* 'cook' is transitive however, it also licenses the construction of a Ty(e→(e→t)) node and an object node. The tree structure that results following the parsing of the verb stem can therefore be seen in (437) below.

(437) Parsing: *n~~ɨ~~ní~~ɨ~~ n-íyó-terek…*



Parsing the final vowel -*a* indicates that no further addition of predicate-argument structure is licensed, adding the bottom restriction to the predicate node and inducing the movement of the pointer from the predicate node to the argument node. The argument node is decorated with information from the object *chák~~ɨ~~rya* 'food'. With the verb form parsed and all the requirements complete, the information is compiled up the tree. The final tree is shown in (438) below.

(438) Parsing: *n~~íní~~ n-íyó-tereka chák~~ʉ~~rya*

⟨*L*⟩Tn(0), Fo(hannah'), Ty(e)

Tn(0), Ty(t), Tns(PRES), Asp(PROG), Fo(terek'(chák~~ʉ~~rya')(hannah')), ◊

Ty(e)
Fo(hannah'),

Ty(e→t),
Fo(terek'(chák~~ʉ~~rya'))

Ty(e),
Fo(chák~~ʉ~~rya')

Ty(e→(e→t)),
Fo(terek'), [↓]⊥

To summarise, the discussion and associated sample derivation above illustrate the approach that is being applied to the formal characterisation of Rangi clause structure. Propositional structure in Rangi is taken to be constructed from an inflected verb form and a combination of lexical actions and computational rules. As a subject pro-drop language which uses subject and object agreement to cross-reference the arguments of a verb, Rangi licenses the construction of complete propositional structure from a verb form alone. In instances where an overt lexical subject NP is present, it is projected onto a LINK structure which is constructed in parallel to the main tree. Subject markers are projected onto locally unfixed nodes annotated with a restricted metavariable, the interpretation of which is restricted by the class information encoded in the subject marker.

I analyse slot 3 tense-aspect markers as resulting in the projection of minimal predicate-argument structure and the annotation of the root node with the appropriate temporal and aspectual information when available. Verb stems are also analysed as resulting in the projection of a fixed skeletal predicate-argument structure, although the extent of this structure is determined by the valency of the verb stem and valency-altering verbal extensions when present. Parsing the information in the slot 7 position, whether it is a tense-aspect suffix or the final

vowel -*a*, indicates that no further predicate-argument structure can be added to the derivation. If an overt object NP is present in the clause, parsing the object provides the interpretation for the ?Ty(e) object node introduced by the verb stem. If the verb contains an object marker, this projects a locally unfixed node annotated with a restricted metavariable. It also licenses the construction of an additional layer of predicate argument structure in anticipation of the parsing of the transitive stem.

4.10 Summary

This chapter has provided an introduction to the framework of Dynamic Syntax and has shown how the Dynamic Syntax framework can be used to analyse Bantu clause structure. After a discussion of the conceptual foundations of Dynamic Syntax, the first half of this chapter worked through the formal tools, presenting these alongside the analytical mechanisms employed by the framework. This included the use of binary semantic trees, the information encoded by these binary semantic trees and the language used to describe them – formal notation based on the *Logic of Finite Trees* (LOFT). The computational rules which are used to move from one partial tree to another as information is established incrementally were presented. This was followed by a discussion of lexical rules and the contribution that these make to the production/parsing process.

The second half of this chapter provided an introduction to the analysis adopted within the DS analyses of Bantu clause structure. Based predominantly on analyses and data from the Bantu language Swahili, it highlighted the main considerations and issues involved in modelling Bantu clause structure using the DS framework. The work that was available to draw from and which is relevant to the current thesis primarily involves issues relating to the interpretation of subject and object information, tense-aspect-mood marking, the verbal template and predication. Swahili was chosen for a sample derivation since data are readily available and a number of DS analyses of Bantu syntax make reference to Swahili. However, it was also necessary to establish the general issues and approach taken in relation to Rangi clause structure, including the ways in which these are similar to those previously

presented for Bantu languages, as well as the ways in which the complexities of the Rangi data necessitate deviation from previous analyses.

The assumptions made in this thesis are that Rangi potential NP subjects are projected onto a parallel tree which is connected to the main tree via a LINK relation. The rule of LINK ADJUNCTION induces the construction of this LINKed tree, as well as introducing a requirement that a copy of the term projected onto this parallel tree is found somewhere in the eventual main tree. This requirement is represented by ?⟨↓∗⟩Fo(α), where α represents the formula value of the term on the LINKed tree. The use of a LINK structure for subject NP expressions reflects the topic status of Rangi NP subjects. This analysis differs from that provided for Swahili where NP subject expressions are analysed as annotating either unfixed nodes or LINK structures. I do not pursue the unfixed node analysis for subject expressions in Rangi since I wish to present an analysis under which the instances in which a NP expression can be introduced, are highly restricted.

I analyse pre-stem tense-aspect markers as responsible for the construction of a fixed subject node and a fixed predicate node as well as the introduction of tense and/or aspect information. In the case of the pre-stem morpheme *a*-, this tense-aspect information is a restriction on the possible interpretation of the clause to non-future which is represented by the annotation ?Tns(NON-FUTURE) at the root node. In the case of other markers this encodes specific temporal and/or aspectual information as is the case with the prefix *íyó*- which encodes present progressive – represented by the annotation Tns(PRES), Asp(PROG) at the root node.

The verb stem is analysed as having a ?Ty(e→t) trigger. This differs from the analysis presented for Swahili under which the verb has a ?Ty(t) trigger (Cann et al. 2005b:305). The ?Ty(e→t) trigger analysis is motivated by the observation that at the point at which verb stems are parsed, a Ty(e→t) node has already been constructed by the pre-stem tense-aspect marker and the pointer is left at the Ty(e→t) node. Similarly to the analysis for Swahili however, I propose that the verb

stem results in the projection of a fixed subject node and a predicate node, as well as an object node and ?Ty(e→(e→t)) predicate node in the case of transitive verbs. I analyse the final vowel as indicating that the predicate-argument structure is complete. The lexical actions encoded within the final vowel result in movement of the pointer from the predicate node to the argument node, prohibiting the building of any further structure.

This chapter presents the assumptions made for the DS analysis of Rangi morphological and syntactic structure, with the aim of providing a background for the formal analyses of Rangi auxiliary-based constructions which are presented in the chapters that follow. With the focus on the cross-linguistically marked infinitive-auxiliary construction, the lexical contribution to tree development made by the infinitive in conjunction with the auxiliary, as well as the individual morphemes involved in the derivation, are examined in detail in Chapters 5 and 6.

5 Modelling Rangi infinitive-auxiliary constructions

5.1 Introduction

Chapter 4 provided an introduction to Dynamic Syntax, outlining the mechanisms of the framework and presenting the conceptual claims on which it is based. Chapter 4 also introduced the key considerations for DS analyses of Bantu languages. The current chapter builds on the theoretical and empirical background established in the thesis thus far, with the aim of providing an analysis of Rangi infinitive-auxiliary constructions from the perspective of the Dynamic Syntax framework.

This chapter begins with a formal characterisation of the past tense auxiliary *-íja* and the immediate future auxiliary *-íise*. I claim that the auxiliaries *-íja* and *-íise* can be analysed as contributing temporal information to the clause. I also analyse these auxiliaries as projecting fixed predicate-argument structure – the analysis which has been proposed for tense-aspect markers across Bantu (Kempson and Marten 2002; Marten and Kula 2011). Compound constructions involving inflected auxiliary forms followed by inflected main verbs pose a challenge to the analysis outlined in Chapter 4, since they involve the parsing of the subject marker twice – on both the auxiliary and the main verb. I therefore propose an amended lexical entry for the Rangi subject marker which allows it to be parsed in the presence of fixed structure. Such an amendment is necessary since the second subject marker is parsed after the auxiliary has introduced a fixed subject node and a fixed predicate node. The analysis developed is also crucially dependent upon a unique characteristic of the DS framework, which is that it allows for the building and re-building of the same structure within a single semantic tree.

The chapter also models the use of the multifunctional auxiliary *-ri* which in its future tense use forms part of the infinitive-auxiliary order characteristic of Rangi. Modelling the Rangi infinitive-auxiliary order requires an analysis under which the infinitival verb form can be processed before the introduction of any tense-aspect information and, in instances of subject pro-drop, before the introduction of any

subject information. I propose an analysis in which the infinitive is projected onto an unfixed predicate node introduced by the rule of PREDICATE ADJUNCTION. Since PREDICATE ADJUNCTION has not previously been defined within Dynamic Syntax, I provide a formal definition of the rule in section 5.3. The chapter then goes on to show its application in the Rangi future tense constructions.

5.2 The past tense auxiliary *-ija*

The past tense auxiliary *-ija* encodes distant past tense. It is used in the distant past perfective and the distant past habitual verb forms. In modelling *-ija*, I consider it to introduce the distant past tense interpretation, as well as being responsible for the projection of a fixed subject node and a fixed predicate node. The construction of fixed minimal predicate-argument structure by this auxiliary reflects its probable historical origin as a main verb (possibly the verb *-ʉja* 'come' (Stegen 2001)). I analyse the aspectual information – perfective or habitual – as being encoded in the main verb. The formal characterisation of the auxiliary *-ija* in the distant past perfective is discussed in section 5.2.1 below, whilst its use in the distant past habitual is discussed in section 5.2.2.

5.2.1 Distant past perfective use of the auxiliary *-ija*

The distant past perfective is formed using the auxiliary *-ija* in combination with a verb form inflected for perfective aspect by the suffix *-ire*. Whilst the main verb carries the lexical and aspectual information, the auxiliary locates the event in the distant past. Both the auxiliary and the main verb are inflected for subject information, as can be seen in example (439) below.

(439) mama a-ija a-dóm-ire
1a.mother SM1-AUX.PAST2 SM1.PAST2-go-PTV
'Mother has gone'

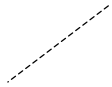
As I proposed for Rangi subject expressions in Chapter 4, parsing *mama* 'mother' results in the establishment of a parallel tree annotated with the formula value Fo(mama'). This parallel tree is connected to the main tree via a LINK relation. Parsing the subject marker on the auxiliary results in the projection of a locally unfixed node annotated with a restricted metavariable Fo(U_{CLASS1}) in the main tree. The expression *mama* 'mother' on the LINK structure provides the necessary

contextual information for the interpretation of the metavariable annotation on the locally unfixed node, enabling update to the full formula value Fo(mama'). The resulting tree can be seen in (440) below.

(440) Parsing: *mama a-…*

$\langle L \rangle$Tn(0), Fo(mama'), Ty(e)

Tn(0), ?Ty(t), $\langle \downarrow^{*} \rangle$Fo(mama')



$\langle \uparrow_0 \rangle \langle \uparrow_1^{*} \rangle$Tn(0),
Ty(e), Fo(mama'), ◊

Bantu tense-aspect markers have been modelled in DS as contributing tense and/or aspect information to the semantic representation established during the parse (Kempson and Marten 2002). Following on from this claim, I analyse -*ija* as contributing distant past tense information to the clause and projecting a fixed subject node and a fixed predicate node. The lexical entry for -*ija* is provided in (441) below.[66]

(441) Lexical entry for the distant past auxiliary -*ija*

-*ija*	IF	?Ty(t), $\langle \downarrow_1^{*} \rangle \langle \downarrow_0 \rangle$Ty(e)
	THEN	put(Tns(DISTANT PAST)); make($\langle \downarrow_0 \rangle$); go($\langle \downarrow_0 \rangle$);
		put(?Ty(e)), go($\langle \uparrow_0 \rangle$); make($\langle \downarrow_1 \rangle$); go($\langle \downarrow_1 \rangle$);
		put((Ty(e→t)), Fo(**W**), ?∃x.Fo(x));
	ELSE	abort

As the lexical entry in (441) above demonstrates, the lexical trigger for parsing the auxiliary -*ija* is the requirement for a propositional value – ?Ty(t) – and the presence of a locally unfixed argument node ($\langle \downarrow_1^{*} \rangle \langle \downarrow_0 \rangle$Ty(e)). This reflects the fact that at the

[66] I propose that, as part of this historical development of the auxiliary -*ija*, the final -*a* has been re-analysed from a distinct inflectional suffix (as the final vowel on a main verb) to form part of the auxiliary form.

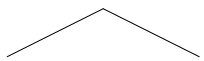
point at which the auxiliary is parsed, no fixed structure is present in the tree. It also reflects the fact that the auxiliary is obligatorily prefixed by a subject marker. When these conditions are met, parsing the auxiliary *-ija* results in the annotation of the root node with the tense annotation Tns(DISTANT PAST)[67] and the projection of a fixed subject node and a fixed predicate node annotated with the metavariable placeholder **W**. The presence of the metavariable on the predicate node reflects the fact that parsing the auxiliary results in the construction of a fixed predicate node but does not contribute a full predicate formula value to the tree. I analyse the auxiliary as responsible only for the introduction of the basic, minimally specified predicate frame, i.e. a subject node and a predicate node. I analyse the predicate-argument structure which results from predicates with a higher valency than monovalent (i.e. transitive and ditransitive), as being introduced by the lexical verb.[68]

Following the introduction of the fixed subject node, the locally unfixed node collapses with the subject node, providing a fixed tree node address for the subject information. The metavariable on the predicate node remains until the main verb is parsed. The tree that follows the parsing of the auxiliary and the induction of the fixed predicate-argument structure is shown in (442) below

(442) Parsing: *mama a-ija…*

$\langle L \rangle$Tn(0), Fo(mama'), Ty(e)

Tn(0), ?Ty(t), Tns(DISTANT PAST), ◊



Ty(e),	Ty(e→t),
Fo(mama')	Fo(**W**), ?∃y.Fo(y)

[67] The annotation Tns(DISTANT PAST), and all other tense and aspect annotations, constitute promissory representations of tense and aspect rather than analyses. As such, these annotations are place-holders for an analysis of temporal information.

[68] The valency of the predicate can further be altered by the addition of the verbal extensions which, when present, occur after the verb stem but before the final vowel *-a* (or other aspectual suffix) in Meeussen's (1967) slot 6.

The next element to be parsed in a distant past perfective construction is the subject marker on the main verb. The lexical entry detailed for Rangi subject markers in Chapter 4 provides that they can only be parsed if there is no fixed structure present. In auxiliary constructions however, fixed structure has already been introduced into the tree by the auxiliary. Moreover, the application of the rule of LOCAL *ADJUNCTION, which would induce the locally unfixed node, has also previously been restricted to clause-initial contexts. As such, I propose an amendment to the lexical entry for Rangi subject markers provided in Chapter 4, allowing them to be parsed in the presence of fixed structure but only when the fixed structure is introduced by an auxiliary. In order to formally encode this restriction, I propose that a subject marker can project a locally unfixed node when it is parsed in the presence of a Ty(e) node annotated with a predicate metavariable (introduced by the auxiliary). The updated lexical entry is shown in (443) below.

(443) Lexical entry for Rangi subject marker *a-* (updated)

a-	IF	?Ty(t)		
	THEN	IF	$\langle\downarrow^*\rangle\bot$	
		THEN	make($\langle\downarrow_1{}^*\rangle\langle\downarrow_0\rangle$); go($\langle\downarrow_1{}^*\rangle\langle\downarrow_0\rangle$);	
			put(Ty(e), Fo(U_{CLASS1}), ?∃x.Fo(x))	
		ELSE	IF	$\langle\downarrow_1\rangle$(Ty(e→t), Fo(**V**), ?∃x.Fo(x))
			THEN	go($\langle\downarrow_0\rangle$);
				put(Ty(e)), Fo($\mathbf{U}_{CLASS1}$), ?∃y.Fo(y))
	ELSE	abort		

Under the lexical entry shown in (443), the subject marker has a ?Ty(t) node as its lexical trigger. Further restriction on the parsing of the subject marker is captured by the two IF clauses. The first IF clause provides that in the absence of any fixed structure, parsing the subject marker results in the projection of a locally unfixed node annotated with the restricted metavariable. The second IF clause provides that in the presence of a predicate metavariable placeholder, parsing the subject marker results only in the annotation of the subject node with a restricted metavariable. In order for the utterance to be successful, the subject marker on the auxiliary and on the main verb form must be of the same noun class. The re-decoration of the subject node with the information provided by the second subject marker ensures the co-

referentiality of these subject markers since they annotate the same node of the same semantic tree. Not only is the re-construction of structure therefore possible within Dynamic Syntax, in this context the re-construction of structure is essential to ensure the co-referentiality of the subject markers. If the subject markers do not agree in terms of noun class, the derivation will fail.

Such an analysis contrasts with those provided by other frameworks in which the reconstruction of structure is not possible and a decision between a pronominal analysis of Bantu subject markers must be made. In light of examples such as those presented here, subject markers in Bantu are typically analysed as agreement makers rather than as incorporated pronouns (see Kinyalolo (1991); Thwala (2006)). Since the same parts of the semantic tree can be constructed more than once (and the same nodes decorated more than once) within DS, an incorporated pronoun analysis is possible, even with a requirement for identity of reference. This analysis therefore harnesses the formal concepts of structural and semantic underspecification made available by the framework.

As has been shown throughout this thesis, parsing the verb stem results in the construction of a fixed subject node and a fixed predicate node. The verb also makes a lexico-semantic contribution, enabling the update of the metavariable placeholder on the predicate node to a full formula value. In the case of a transitive predicate, parsing the verb also results in the projection of a Ty(e→(e→t)) predicate node and its corresponding object argument node. The lexical entry for the intransitive use of the predicate *-dom-* 'go' is shown in (444) below.

(444) Lexical entry for the verb *-dom-* 'go'

-dom-	IF	?Ty(e→t))
	THEN	go($\langle\uparrow_0\rangle$), make($\langle\downarrow_0\rangle$); go($\langle\downarrow_0\rangle$);
		put(Ty(e), Fo(**U**), ?∃x.Fo(x));
		go($\langle\uparrow_0\rangle$); go($\langle\downarrow_1\rangle$); put(Ty(e→t), Fo(dom'));
	ELSE	abort

The lexical trigger for verb stems in inflected verb forms is ?Ty(e→t). Given the presence of this processing condition, parsing the verb stem *-dom-* results in the projection of a fixed subject node and a fixed predicate node. The nodes introduced by the verb collapse with the fixed structure which has been introduced by the auxiliary. The conceptual-semantic contribution made by the verb provides the information about the predicate, enabling the update of the predicate metavariable introduced by the auxiliary to a full formula value – in this case Fo(dom'). The resulting partial tree structure can be seen in (445) below.

(445) Parsing: *a-ija a-dom-…*

Tn(0), ?Ty(t), Tns(DISTANT PAST)

Ty(e), Fo(mwaas~~u~~') | Ty(e→t), Fo(dom'), ◊

Parsing the perfective suffix *-ire* on the main verb results in the introduction of perfective aspect to the clause. This is represented by the annotation of the top node with Asp(PERFECTIVE). Parsing *-ire* also indicates the end of the verbal form and means that no further predicate nodes can be constructed. With all the requirements fulfilled, the information is compiled up the tree. The final stage in the derivation is shown in the semantic tree in (446) below.

(446) Parsing: *a-ija a-dom-ire*

Ty(t), Tns(DISTANT PAST), Asp(PERFECTIVE), Fo(dom'(mwaas~~u~~')), ◊

Ty(e), Fo(mwaas~~u~~') | Ty(e→t), Fo(dom'), ⟨↓⟩⊥

The tree in (446) above shows the annotation of the top node with the tense information Tns(DISTANT PAST) and the aspectual information Asp(PERFECTIVE). The information which has been compiled up the tree shows the subject Ty(e) node annotated with the formula value Fo(mwaas~~u~~'), whilst the predicate node is

annotated with information from the verb stem Fo(dom'). The annotations of the subject and predicate node are also present at the root node in the annotation Fo(dom'(mwaas~~u~~'))

5.2.2 Distant past habitual use of the auxiliary *-ija*

I propose that the analysis provided above for the past perfective use of *-ija* can also be extended to the distant past habitual construction, where *-ija* is used alongside a verb form inflected for habitual aspect by the suffix *-áa*. An example of this construction can be seen in (447) below.

(Dunham 2006:157)

(447) tw-ija twá-kikal-áa Kondoa
SM1stpl-AUX.PAST2 SM1stpl.PAST2-stay-HAB Kondoa
'We used to live in Kondoa'

The derivation proceeds in the same way as was shown above for the distant past perfective. However, parsing the habitual suffix *-áa* on the main verb results in the introduction of the habitual aspect interpretation. This is represented on the tree by the annotation Asp(HAB). A snapshot of the final stage in the derivation of the distant past habitual example can be seen in (448) below.

(448) Parsing: *tw-ija tu-á-kikal-áa Kondoa*

Ty(t), Tns(DISTANT PAST), Asp(HAB), Fo(kikal'(kondoa')(speakers')), ◊

Ty(e), Fo(speakers')

Ty(e→t), Fo(kikal'(kondoa'))

Ty(e), Fo(kondoa')

Ty(e→(e→t)), Fo(kikal')

The analysis presented above for *-ija* is based on the assumption that constructions involving the past tense auxiliary *-ija* are monoclausal. Formally, this means that the auxiliary and the inflected main verb annotate a single semantic tree. I propose a monoclausal analysis over a bi-clausal analysis for two reasons. The first is based on

the interaction between auxiliary constructions and the tense-aspect system, while the second is based on the historical connection between auxiliaries and main verbs.

Firstly, the use of the auxiliary to encode temporal information and the main verb to encode aspectual information means that the auxiliary construction can be used to express complex tense-aspect information as a single event. I propose that auxiliaries are used in Rangi to express tense-aspect combinations, which cannot be expressed through the use of a simplex verb form. For example, the use of the auxiliary -*ída* is the only way to convey a combination of the distant past tense and the habitual or perfective aspect. This is because the distant past tense in simplex verb forms is encoded through the suffix -*á* and as such competes with both the habitual marker -*áa* and the perfective marker -*ire*, which appear as suffixes in the slot 7 position. The use of the past tense auxiliary -*ída* in a compound construction is therefore the only way to encode this specific tense-aspect combination. The fact that tense-aspect information is encoded across the auxiliary and the verb provides further support for the availability re-building and re-decorating nodes in DS.

The proposal of a monoclausal analysis of the -*ída* constructions is also based on the historical connection between auxiliaries, main verbs and tense-aspect markers. This is further supported by observations relating to language change. The origin of auxiliaries in lexical verbs has been noted across Bantu languages, where tense-aspect makers have been noted to have developed from grammaticalised auxiliaries and auxiliary verbs (Botne 1989). This claim has frequently been made for Swahili tense-aspect makers for example, many of which derive from lexical verbs. Sacleux (1909) claims that all Swahili tense-aspect makers have their origins in grammaticalised auxiliaries. Examples include the future tense marker -*ta*-, which Heine et al. (1991:172) and Botne (1989) argue is derived from the verb -*taka* 'want' with an intermediate stage of grammaticalisation in the form -*taka*- appearing with relativised verbs. The Swahili past tense maker -*li*- can also be related to the lexical verb 'to be' (Meinhof 1899; Ashton 1944:205; Miehe 1979:204ff; Heine and Reh 1984:130) (cf. (Krifka 1983:195)). In Rangi, this can be seen in the iterative marker -*endo*-, which is thought to be derived from the verb *kweenda* 'want, like' (Dunham

2005:154) and the ventive marker *too-*, which is thought to derive from either the verb *-toola* 'take' (Dunham 2005:153) or the verb *-ita* 'go' (Stegen 2001). The auxiliary form *-ija* is thought to derive from the verb *-~~u~~ja* 'come' (Stegen 2001).

In the formal modelling of *-ija* provided above, the auxiliary is analysed as introducing fixed predicate-argument structure and temporal information. Unlike a main verb, it does not make any contribution in terms of the lexico-semantics of the predicate. In this regard, since the auxiliary is bleached of other semantic content, it behaves more like a tense-aspect marker than a verb. In terms of structural contribution however, Rangi auxiliaries pattern with both verbs and tense-aspect markers, which are also responsible for building fixed-predicate argument structure. A comparison of the formal characteristics of Rangi inflected verbs, auxiliary forms and tense-aspect markers is provided in Table 22 below.

Table 22: Comparison of DS characteristics of main tense-aspect markers, auxiliaries and main verb stems

	Lexical trigger	**Lexical actions**
TA marker (pre-stem slot 3)	Query type *t* and a locally unfixed node with subject annotation $?Ty(t), \langle\downarrow_1^*\rangle\langle\downarrow_0\rangle(Ty(e), Fo(\alpha))$	Build fixed minimal predicate-argument frame Provide tense and/or aspectual annotation (Tns(x)), Asp(y))
Auxiliary	Query type *t* and a locally unfixed node with subject annotation $?Ty(t), \langle\downarrow_1^*\rangle\langle\downarrow_0\rangle(Ty(e), Fo(\alpha))$	Build fixed minimal predicate-argument frame Provide tense and/or aspectual annotation (Tns(x)), Asp(y)) Introduce predicate metavariable (Fo(**U**), $?\exists x.Fo(x)$)
Verb stem	Query type $e \rightarrow t$ $?Ty(e \rightarrow t)$	Build fixed predicate and argument(s) node(s) Provide full formula annotation

The table above shows the lexical triggers and lexical actions associated with Rangi tense-aspect markers, auxiliaries and main verb stems. Pre-stem tense-aspect markers have a ?Ty(t) node and the presence of a locally unfixed node annotated with some subject information as their lexical trigger. When these triggering conditions are met, parsing the pre-stem tense-aspect marker results in the construction of fixed minimal predicate-argument structure and the introduction of tense-aspect information. I propose the same lexical trigger for auxiliaries. Parsing the auxiliary also results in the projection of fixed minimal predicate-argument structure. Unlike the tense-aspect marker however, I analyse the auxiliary as introducing a metavariable on the predicate node, which requires update to a full formula value (which it receives from the main verb), before the derivation is complete.

Verb stems have a ?Ty(e→t) node as their lexical trigger. The lexical actions they induce result in the construction of fixed predicate-argument structure of a valency determined by the predicate in question. Parsing verb stems also makes the semantic-conceptual contribution to the clause and can provide update to a full formula value for a metavariable on the predicate node. The similarities between the structure induced by tense-aspect markers, lexical verbs and auxiliaries reflects the historical relation between these elements. Structurally, verbs and auxiliaries pattern together. Auxiliaries also pattern with tense-aspect markers however, making a temporal contribution to the clause.

This section has provided an analysis for the Rangi past tense auxiliary -*ija*. The analysis is based on the premise that the past tense auxiliary contributes tense information in a manner similar to the tense-aspect markers found in Rangi and other Bantu languages. This contribution is represented by the annotation Tns(DISTANT PAST) at the root node. In the distant past perfective, this tense interpretation is accompanied by a perfective suffix on the main verb, resulting in a combination of distant past tense and perfective aspect. In the distant past habitual, the past tense auxiliary -*ija* appears in conjunction with the habitual suffix -*áa*, which appears on the main verb.

Building on the analysis provided for the past tense auxiliary -*íja* above, the next section addresses the immediate future auxiliary -*íise*. I also analyse -*íise* as making the specific immediate future temporal contribution to the clause. However, the analysis I provide for -*íise* necessarily differs from that provided for the past tense auxiliary, since -*íise* is used in the infinitive-auxiliary construction. The marked order of the auxiliary with respect to the infinitive is also discussed.

5.3 The immediate future auxiliary -*íise*

Of the auxiliaries outlined in Chapter 3, only the immediate future auxiliary -*íise* and the auxiliary -*r~~ɨ~~* participate in the infinitive-auxiliary constructions. In these constructions, the auxiliary is used in conjunction with an infinitival verb form and consistently appears after the verb in declarative main clauses. The formal characterisation of the auxiliary -*íise* and the future tense constructions in which it is found comprise the focus of the current section. The analysis of the auxiliary -*r~~ɨ~~* and its use in the general future tense is found in section 5.4.

The auxiliary -*íise* is used alongside an infinitival verb form to express immediate future tense. This can be seen in example (449) below, where the infinitival verb form *l~~úú~~sa* 'speak' appears before the auxiliary, which is inflected for first person singular subject information and appears as *níise*.

(449)	n~~íí~~n~~ɨ~~	l~~úú~~s-a	n-íise	a-ha	víí
	1st sg.PP	speak-FV	SM1st sg-AUX	DEM-16	just
	'I will talk soon'				

Following on from the analysis of the auxiliary -*íja*, I analyse -*íise* as projecting fixed minimal predicate-argument structure, as well as contributing immediate future tense to a clause. The immediate future tense interpretation is represented by the annotation Tns(IMM FUTURE) at the root node. In order to capture the characteristics of the infinitive-auxiliary construction however, I claim that parsing the infinitive in the initial position results in the projection of an unfixed predicate node. This unfixed predicate node receives a full formula value annotation from the infinitive, but does not receive a fixed tree node address until the auxiliary is parsed.

Infinitival verb forms in Rangi carry no obligatory morphological marking which differentiates them from the verb stem in inflected verb forms (see section 2.5.2). I therefore make reference to the distinct processing conditions in which infinitival verb forms are parsed to differentiate them from verb stems. Specifically, I propose that the lexical trigger for parsing an infinitive in the future tense infinitive-auxiliary construction is the presence of an unfixed predicate node. This differs from the lexical trigger for a verb stem in an inflected verb form, for which I propose the lexical trigger to be a (fixed) ?Ty(e→t) node. With distinct lexical triggers, the lexical actions which are induced following the parsing of the infinitival verb form and those induced following the parsing of the inflected verb form, can be distinguished.

I propose that parsing an infinitival verb form, such as *l~~uu~~sa* 'speak', as the first element in the derivation provides the annotation for an unfixed Ty(e→t) predicate node introduced by the computational rule of PREDICATE ADJUNCTION. I define the rule of PREDICATE ADJUNCTION to account for the projection of an unfixed predicate node for which no formal provision has previously been made within the Dynamic Syntax framework. The rule of PREDICATE ADJUNCTION induces an unfixed Ty(e→t) node from a ?T(t) node and is defined in (450) below.

(450)

$$\frac{\{\ldots\{\{Tn(a),\ldots,?Ty(t),\ \Diamond\}\}\ldots\}}{\{\ldots\{\{Tn(a),\ldots,?Ty(t)\},\ \{\langle\uparrow^{*}\rangle Tn(a),\ ?\exists x.Tn(x),\ldots ?Ty(e\rightarrow t),\ \Diamond\}\}\ldots\}}$$

As can be seen on examination of (450) above, the PREDICATE ADJUNCTION rule induces an unfixed predicate node from a query type *t* node. I argue that the introduction of a PREDICATE ADJUNCTION rule is a natural extension of the DS framework, which already provides for unfixed argument nodes and which recognises different types (Kempson et al. 2001; Cann et al. 2005b). The rule of PREDICATE ADJUNCTION is therefore consistent with the overall architecture of the DS system. I further propose that the distributional properties exhibited by the

infinitive in Rangi, particularly in the infinitive-auxiliary constructions, mean that the extension of the DS framework to include the notion of an unfixed predicate node is well-founded.

Following the application of the rule of PREDICATE ADJUNCTION, the infinitive is projected onto an unfixed Ty(e→t) node, which it annotates with a full formula value. Parsing the infinitive also licenses the construction of predicate-argument structure, the extent of which is determined by the predicate in question. In the case of the intransitive predicate *lʉʉsa* 'speak', this will result in the construction of a Ty(e→t) node and the annotation of this predicate node with the formula value Fo(lʉʉsa'). A preliminary lexical entry for the infinitival verb form *lʉ́ʉ́sa* is shown in (451) below.[69]

(451) Lexical entry for the infinitive *lʉ́ʉ́sa*

lʉ́ʉ́sa	IF	?Ty(t), ⟨↓*⟩?Ty(e→t)
	THEN	go(⟨↓*⟩); put(Ty(e→t), Fo(lʉʉs'));
		go(⟨↑*⟩)
		…
	ELSE	abort

As can be seen on examination of the lexical entry above, the infinitival verb form has a requirement for a type *t* node and the presence of an unfixed Ty(e→t) node as its lexical trigger.[70] Parsing the infinitival verb results in the annotation of this unfixed predicate node with the lexical-semantic contribution made by the verb form – in this case Fo(lʉʉs'). If the processing conditions are not met at any stage, the derivation will abort.

[69] In the lexical entry (…) indicates that additional lexical actions are also possible. This is used to indicate that the lexical entry provided covers only some of the use of the morpheme.

[70] This unfixed predicate node is introduced by PREDICATE ADJUNCTION. I propose that the unfixed predicate node is introduced by a computational rule rather than as the result of lexical actions. This is motivated by the need to be able to distinguish between the lexical actions induced by the infinitival verb form and those induced by a verb stem in an inflected verb form, since there is often no distinct morphological marking on an infinitival verb form.

In the infinitive-auxiliary order, the next item to be parsed is the subject marker on the inflected auxiliary -*íise*. Parsing the subject marker results in the projection of a locally unfixed node annotated with a restricted metavariable determined by the noun class of the subject marker. These two nodes can co-exist due to their different modalities – one is an unfixed predicate node whilst the other is a locally unfixed node. The subject marker can be parsed since there is still no fixed structure present in the tree at this stage. Parsing the auxiliary -*íise* then results in the projection of a fixed subject node and a fixed predicate node, as can be seen on examination of the lexical entry shown in (452) below.

(452) Lexical entry for -*íise*

-*íise*	IF	?Ty(t), $\langle\downarrow_1{}^*\rangle\langle\downarrow_0\rangle$Ty(e)
	THEN	put(Tns(IMM FUTURE));
		make($\langle\downarrow_0\rangle$); go($\langle\downarrow_0\rangle$); put(?Ty(e));
		go($\langle\uparrow_0\rangle$); make($\langle\downarrow_1\rangle$); go($\langle\downarrow_1\rangle$);
		put(Ty(e→ t), Fo(**V**), ?∃y.Fo(y))
	ELSE	abort

The lexical trigger for the auxiliary is ?Ty(t) and the presence of a locally unfixed node (as was also the case for the past tense auxiliary -*íja)*. The lexical actions encoded by the auxiliary -*íise* result in the annotation of the root node with the tense information Tns(IMM FUTURE) and the construction of a fixed subject node and a fixed predicate node decorated with a metavariable annotation. The presence of this fixed structure enables the establishment of a fixed tree address for the predicate node – which has remained unfixed until this point. The metavariable on the predicate node receives interpretation immediately from the full predicate formula value provided by the infinitive. A sample derivation of an immediate future tense construction is shown in 5.3.1 below.

5.3.1 Sample derivation: *n~~íí~~ni l~~uu~~sa níise*

A sample derivation showing the steps involved in parsing the immediate future tense expression in example (453) is presented below.

(453) n~~iíni~~ l~~úús~~-a n-íise a-ha víí
1st sg.PP speak-FV SM1st sg-AUX DEM-16 just
'I will talk soon'

The overt subject NP is projected onto a LINK structure, which is developed in parallel to the main tree. This LINK structure provides the background against which the subject marker on the auxiliary will be interpreted. The overt NP provides information for the decoration of the LINK structure following the parsing of *n~~iíni~~* 'I'. This results in the LINK structure receiving the formula value annotation Fo(speaker'). This can be seen in the tree in (454) below.

(454) Parsing: *n~~iíni~~…*

⟨*L*⟩Tn(0), Fo(speaker'), Ty(e) ⟶ Tn(0), ?Ty(t), ?⟨↓*⟩Fo(speaker'), ◊

The LINK structure introduces the requirement that a copy of the formula value – in this case Fo(speaker') – be found somewhere within the eventual main tree. An unfixed predicate node is introduced via the rule of PREDICATE ADJUNCTION. Parsing the infinitival verb form *l~~uu~~sa* results in the annotation of this unfixed predicate node with the semantic information from the infinitive. The resulting tree can be seen in (455) below.

(455) Parsing: *l~~uu~~sa…*

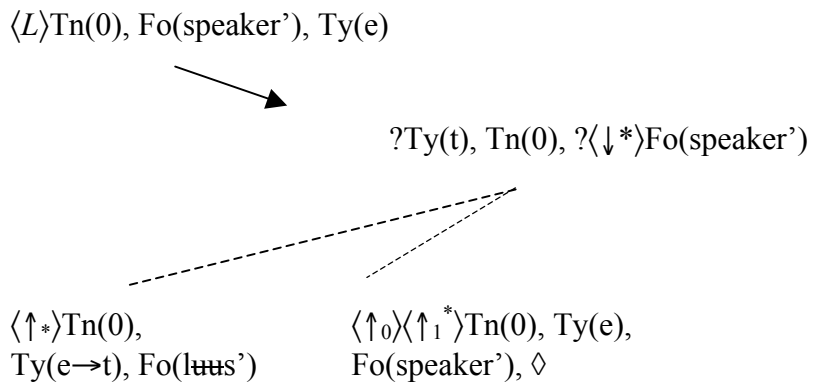
⟨*L*⟩Tn(0), Fo(speaker'), Ty(e) ⟶ Tn(0), ?Ty(t), ?⟨↓*⟩Fo(speaker')

⟨↑*⟩Tn(0), Ty(e→t), Fo(l~~uu~~s'), ◊

With the auxiliary obligatorily hosting subject agreement, the next element to be parsed is the subject marker. The pointer moves via ANTICIPATION back up to the root node. Parsing the subject marker on the auxiliary results in the projection of a locally unfixed node annotated with the restricted metavariable (which is determined by the class information of the subject marker). Since in the current derivation, the

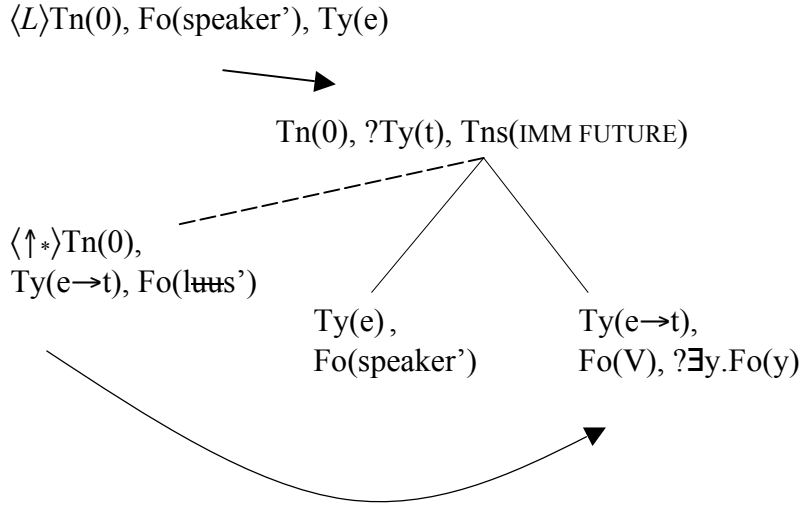
auxiliary is marked with first person singular agreement, the locally unfixed node receives the annotation Fo(speaker'), as can be seen in the partial tree in (456) below.

(456) Parsing: *l~~uu~~sa n-…*



Parsing the future tense auxiliary *-íise* results in the construction of a fixed subject node and a fixed predicate node. The auxiliary *-íise* also introduces the future tense interpretation to the clause (represented by the annotation Tns(IMM FUTURE) at the root node). The subject node receives immediate interpretation from the term Fo(speaker'), which annotates the LINKed tree. The information from the unfixed predicate node provides immediate interpretation for the metavariable (**V**) on the predicate node via the process of MERGE. This is illustrated in the tree in (457) below.

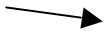
(457) Parsing: *l~~uu~~sa níise*



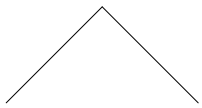
The subject and predicate nodes receive fixed tree node addresses. With all of the requirements fulfilled, the information is compiled up the tree. The resulting structure is shown in (458) below.

(458) Parsing: *l~~uu~~sa n-íise..*

$\langle L \rangle$Tn(0), Ty(e), Fo(speaker')



Tn(0), Ty(t), Tns(IMM FUTURE), Fo(l~~uu~~s'(speaker')), ◊



Ty(e), Fo(speaker') | Ty(e→t), Fo(l~~uu~~s')

This section has presented a formal characterisation of the immediate future auxiliary *-íise* within the Dynamic Syntax framework. The analysis provided is based on the notion that the immediate auxiliary *-íise* is responsible for the contribution of immediate future tense (Tns(IMM FUTURE)) information to a parse. Such an analysis is possible due to the use of this auxiliary solely in the immediate future tense. In line with the analysis provided for the past tense auxiliary *-íja*, I also analyse the immediate future auxiliary as responsible for the introduction of a fixed predicate node and a fixed subject node. In order to account for the postverbal positioning of the auxiliary, I analyse the infinitive as annotating an unfixed predicate node introduced via the rule of PREDICATE ADJUNCTION. Parsing the subject marker on the auxiliary results in the projection of a locally unfixed node annotated with a restricted metavariable determined by the class of the subject marker. Parsing the auxiliary results in the projection of a ?Ty(e) fixed subject node and a fixed ?Ty(e→t) predicate node. The presence of the fixed subject node enables the fixing of the tree node address of the logical subject, as well as the establishment of a fixed tree node address for the unfixed predicate node. Section 5.4 examines the multifunctional auxiliary *-r~~i~~* and provides a formal characterisation of its use from the perspective of DS.

5.4 The multifunctional auxiliary *-rɨ*

This section provides an analysis of the auxiliary *-rɨ*, which is used in the formation of a present tense copula construction as well as in the general future and recent past tense (see section 3.2.7 for further examples of these uses). The use of *-rɨ* in a number of different tenses means that it cannot be analysed as the sole contributor of tense to a construction – the analysis adopted for the past tense auxiliary *-ija* and the immediate future auxiliary *-íise*. Whilst in its recent past tense use, the auxiliary *-rɨ* is inflected for past tense by the prefix *áá-*, in the general future tense and the present tense, there is no distinct morphological marking of tense. The analysis I propose is that in the past tense use of *-rɨ,* the prefix *áá-* is responsible for encoding past tense. In its present tense use, I claim the present tense reading is the default reading for the auxiliary *-rɨ*. I further propose that in the general future tense, the future tense interpretation follows from parsing the auxiliary in the presence of an unfixed node. An examination of the past tense use of *-rɨ* is presented in section 5.4.1 below.

5.4.1 Past tense usage of *-rɨ*

The combination of recent past tense and perfective aspect, are encoded through a compound construction involving the auxiliary *-rɨ* and an inflected main verb. Whilst *-rɨ* is inflected for past tense by the prefix *áá-*, the main verb is inflected for perfective aspect by the suffix *-ire.* Both the auxiliary and the main verb are inflected for subject information. This construction can be seen in example (459) below.

(459) n-áá-rɨ n-a-téy-ire mʉ-teho w-áánɨ
SM1st sg-PAST.1-AUX SM1st sg-PAST1-set-PTV 3-trap 3-my
'I have set my trap'

Parsing the subject marker on an utterance such as example (459) results in the projection of a locally unfixed node annotated with a restricted metavariable. The possible substituents of the metavariable are determined (and restricted) by the noun class of the subject marker. Parsing the past tense marker *áá-* introduces the recent past tense information and projects a fixed subject node and a fixed predicate node.

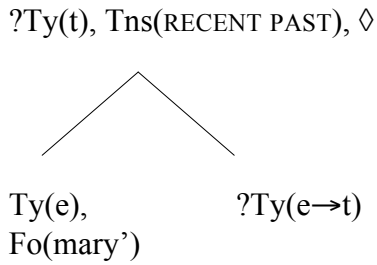
The lexical actions induced by parsing the past tense marker *áá-* can be seen in the lexical entry provided in (460) below.

(460) Lexical entry for past tense marker *áá-*

-áá-	IF	?Ty(t), $\langle\downarrow_1^*\rangle\langle\downarrow_0\rangle$(Ty(e) Fo($U_{CLASSX}$))
	THEN	put(Tns(RECENT PAST)); make($\langle\downarrow_0\rangle$); go($\langle\downarrow_0\rangle$); put(?Ty(e)); go($\langle\uparrow_0\rangle$); make($\langle\downarrow_1\rangle$); go($\langle\downarrow_1\rangle$); put(?Ty(e→t)); go($\langle\uparrow_1\rangle$)
	ELSE	abort

The lexical trigger for the parsing of the past tense marker *áá-* is the presence of a locally unfixed node annotated with subject information. The subject marker can be of any class as is represented by *x* in the formula value metavariable restriction Fo(U_{CLASSX})). This trigger means that the tense marker can only be parsed after the information from the subject marker has been introduced. Parsing the past tense marker *áá-* results in the annotation of the top node with the information (Tns(RECENT PAST)), and the construction of a fixed subject node and a fixed predicate node. In the case of the first person singular subject information, the term Fo(speaker') receives immediate update with an appropriate referent from context, i.e. Fo(mary'). The locally unfixed node collapses with the fixed subject node. The resulting tree structure is shown in (461).

(461) Parsing: *n-áá-…*



The tree in (461) above shows the structure that is present after parsing the subject marker and the past tense marker *áá-*. At this stage in the derivation, the tree contains a fixed subject node with a full formula value, which adheres to the lexical restrictions of the subject marker, and a fixed predicate node.

I analyse parsing the auxiliary *-rɨ* as responsible for the induction of a fixed subject node and a fixed predicate node. Whilst in the current derivation this fixed structure has already been introduced by the past tense marker *áá-*, I propose that parsing *-rɨ* introduces these nodes in order to be able to account for instances in which *-rɨ* is not preceded by a tense marker.[71] The lexical entry for the auxiliary *-rɨ*, showing the lexical actions induced when it is parsed in its recent past usage, is shown in (462) below.[72]

(462) Lexical entry for *-rɨ* (in its recent past tense use)

-rɨ	IF	?Ty(t), Tns(RECENT PAST)
	THEN	make($\langle\downarrow_0\rangle$); go($\langle\downarrow_0\rangle$); put(?Ty(e)); go($\langle\uparrow_0\rangle$); make($\langle\downarrow_1\rangle$); go($\langle\downarrow_1\rangle$); put(Ty(e→t)), Fo(**W**), ?∃x.Fo(x)); go($\langle\uparrow_0\rangle$) …
	ELSE	abort

The auxiliary *-rɨ* has a ?Ty(t) node annotated with the recent past tense information (Tns(RECENT PAST)) as its lexical trigger. The lexical actions induced by parsing *-rɨ* result in the construction of minimal predicate-argument structure – a fixed subject node and a fixed predicate node annotated with a metavariable placeholder. In this past tense construction, fixed structure has already been introduced by the past tense morpheme *áá-*. As a result, the fixed subject node and fixed predicate node introduced by *-rɨ* collapse onto the pre-existing fixed structure. Parsing the auxiliary introduces a metavariable Fo(**W**) at the predicate node, and the requirement that this metavariable receive interpretation before the derivation is complete ?∃x.Fo(x). I claim that a similar analysis can be extended to all auxiliaries in Rangi, which I analyse as projecting a fixed subject node and a fixed predicate node, annotated with a metavariable.

[71] Proposing that *-rɨ* induces the construction of a fixed subject node and a fixed predicate node also maintains a uniformity in the analysis of Rangi auxiliaries, all of which I modelled as projecting fixed minimal-predicate argument structure.

[72] The lexical entry shown in (462) is only for the past tense use of *-rɨ*. Its use in other tenses is accounted for in sections 5.4.2 and 5.4.3.

I propose that such an analysis can be used to account for the historical connection between auxiliaries and main verbs – both of which I analyse as projecting fixed predicate-argument structure. I also claim that such an analysis appropriately reflects the fact that whilst auxiliaries make a structure contribution to the clause, leading to the establishment of fixed predicate-argument structure, they are not responsible for the introduction of any lexical or semantic information since they are bleached of their lexico-semantic content. Under this analysis, whilst *-rɨ* leads to the establishment of a fixed subject node and a fixed predicate node, the auxiliary is not responsible for the introduction of the recent past tense interpretation into the clause. Rather, it is the prefix *áá-* that is responsible for the past tense interpretation. A tree showing this stage of the derivation can be seen in (463) below.

(463) Parsing: *n-áá-rɨ...*

Tn(0), ?Ty(t), Tns(RECENT PAST), ◊

Ty(e),
Fo(mary')

Ty(e→t),
Fo(**W**), ?∃x.Fo(x)

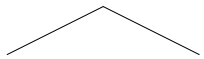
On the basis of the reworked lexical entry for the subject marker shown in (443), the IF clause of the lexical entry for the subject marker is sensitive to the presence of a predicate metavariable. In the presence of such a metavariable, parsing the subject marker on the main verb results in the annotation a subject node. If the metavariable annotation and the information introduced by the subject marker are not of the same noun class, the node annotations will be inconsistent and the parse will fail.

I propose that parsing the pre-stem marker *a-* on the main verb results in the introduction of the requirement ?Tns(NON-FUTURE), which acts to restrict the possible tense interpretations of the clause to those which are not future tense. This reflects the fact that the pre-stem marker *a-* appears in a number of different tense-

aspect configurations but is not found in the future tense.[73] In this instance, the non-future tense restriction is compatible with the past tense contribution which has already been made by *áá-*, and which is represented at the root node by the annotation Tns(RECENT PAST).

(464) Parsing: *n-áá-rɨ n-a-....*

Tn(0), Ty(t), Tns(RECENT PAST), Asp(PERFECTIVE), ◊



Ty(e),	Ty(e→t),
Fo(Mary')	Fo(**W**), ?∃x.Fo(x)

I propose an analysis under which parsing the main verb stem *tey* 'set trap', results in the construction of a fixed subject node and a fixed Ty(e→t) predicate node, as well as an object node and a Ty(e→(e→t)) predicate node. Parsing the verb stem also introduces the lexico-semantic information about the predicate, – which results in the annotation of the predicate node with Fo(tey').

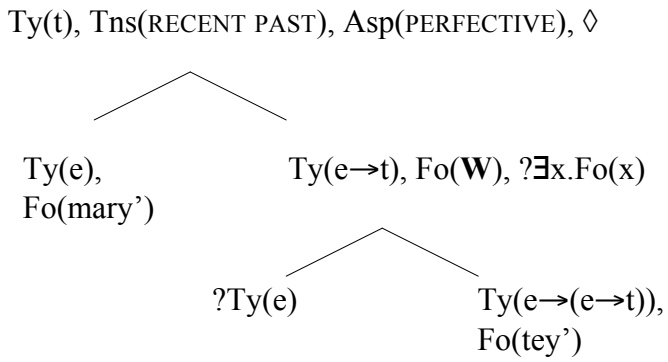
One of the challenges posed by auxiliary constructions of this type, is that at this stage in the derivation, the predicate node is already type-complete. This can be seen in the tree in (464) above, where the predicate node is decorated with Ty(e→t), not ?Ty(e→t). As they stand, the rules of COMPLETION and ELIMINATION require a query at the root node (?Ty(t)) in order to apply. With a type-complete Ty(e→t) predicate node, there is no motivation for the derivation to continue after the auxiliary has been parsed. This is because both the ?Ty(e) requirement on the subject node and the ?Ty(e→t) requirement have already been satisfied and, with the pointer at the root node, the derivation is type-complete even before the main verb is parsed.

[73] The relatively weak semantic contribution made by the pre-stem marker *a-*, adds support to the proposal that the retention of this marker is motivated by the structural contribution it makes. Since I have analysed Rangi verb stems as having a ?Ty(e→t) node as their lexical trigger, the presence of the pre-stem marker *a-* ensures that this ?Ty(e→t) node is present in the tree at the point when the verb stem is parsed.

I therefore propose an amendment of the rule of COMPLETION which allows COMPLETION to occur with a type-satisfied Ty(t) node, but only in instances in which there is a metavariable on the predicate node. I propose that such an amendment to the rule of COMPLETION is well-founded for Rangi on the basis that auxiliary constructions result in the establishment of propositional structure with a specific sect of characteristics. As such, this amendment only requires an extension of the COMPLETION rule so it can occur in the presence of a metavariable annotation on a predicate node. This amendment therefore enables the pointer to move to the predicate node, satisfying the lexical trigger for the verb Ty(e→t), and allows for update to a full formula value for the metavariable annotating the predicate node.

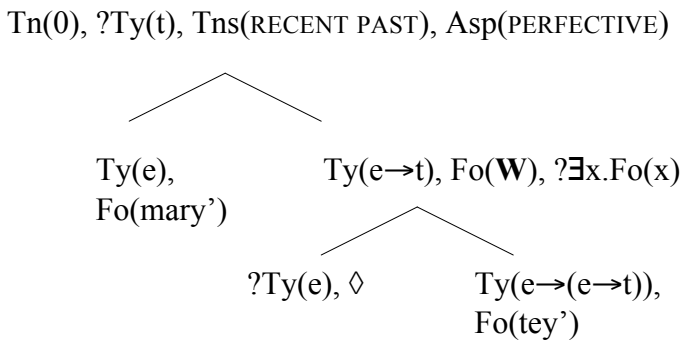
Returning to the derivation currently under consideration, parsing the verb stem in the main verb results in the projection of a fixed subject node and a fixed predicate node. These nodes collapse with the fixed predicate-argument structure already introduced by parsing *-rɨ*. As a transitive verb, parsing *-tey* also results in the projection of an additional object argument node and a Ty(e→(e→t)) predicate node. The resulting tree structure is shown in (465) shown below.

(465) Parsing: *n-áá-rɨ n-a-téy....*



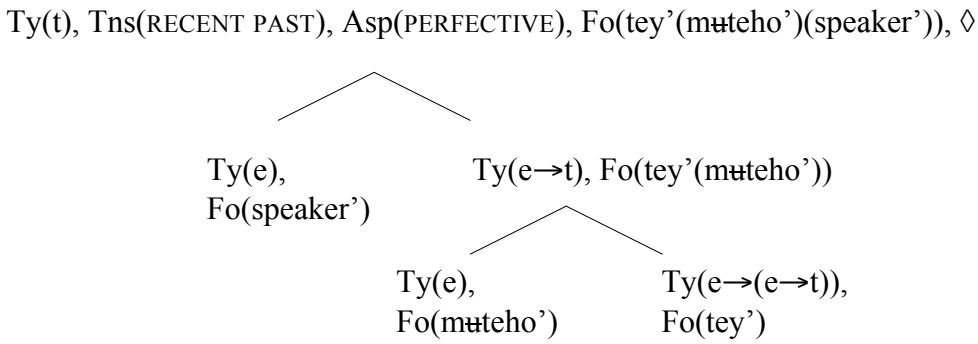
Parsing the suffix *-ire* introduces the perfective aspect. This is represented by the annotation Asp(PERFECTIVE) at the root node. Parsing *-ire* also moves the pointer to the object node, ensuring that no further predicate-argument structure can be added to the tree. The tree at this stage in the derivation can be seen in (466) below.

(466) Parsing: *n-áá-r~~ɨ~~ na-téy-ire....*



With the pointer at the ?Ty(e) object node, parsing the expression *m~~u~~teho* 'trap' enables the interpretation of the object and the satisfaction of the ?Ty(e) requirement on the object argument node. The interpretation of objects in this way, contrasts with Rangi subject NPs, which I analyse as being connected to the main tree via a LINK structure established by the rule of LINK ADJUNCTION (see section 4.9.3). With all of the requirements satisfied, the information is compiled up the tree. A snapshot of the final tree in the derivation is shown in (467) below.

(467) Parsing: *náár~~ɨ~~ natéyire m~~u~~teho*



As can be seen on the basis of this sample derivation, I propose that the auxiliary *-r~~ɨ~~* introduces fixed predicate-argument structure but makes no lexico-semantic contribution to the clause or associated tree structure.[74] This analysis is further

[74] This is further supported by the observation that in certain dialects of Rangi, the presence of the auxiliary *-r~~ɨ~~* in the past perfective is optional. Thus, compounds of the form SM-áá SM-a-H-ire are also found (Oliver Stegen, personal correspondence). The presence of these

supported by the modelling of the English auxiliary system provided by Cann et al. (2005b:333), under which the interpretation of a copula form is taken to be dependent on the properties of the expressions that appears alongside the copula.

The auxiliary use of *-rɨ* enables a combination of specific tense-aspect information to be expressed which would otherwise not be possible. This was also proposed to be the case for the past tense auxiliary *-íja* and can also be seen with the Swahili auxiliary verb *kuwa* 'to be'. The auxiliary verb *kuwa* 'to be' functions both as a copula and as an inflected verb form in certain tense-aspect combinations. The use of *kuwa* can be seen in examples (468) and (469) below, where it is used to form a combination of past tense and perfective aspect.

(468) ni-li-kuwa ni-me-ondok-a [Swahili]
SM1st sg-PAST-COP SM1st sg-PERF-leave-FV
'I had left'

(469) a-li-kuwa a-me-som-a ki-tabu [Swahili]
SM1-PAST-COP SM1-PERF-read-FV 7-book
'S/he had read the book'

In these examples, *kuwa* acts as the host of the past tense marker *-li-* whilst the main verb is inflected with the perfective marker *-me-*. These specific combinations of past tense and perfective aspect are not available in simplex Swahili verb forms since the morphemes compete for the same slot within the verbal template.

The analysis I propose for Rangi is based on the notion that auxiliaries are regularly used to encode specific combinations of tense-aspect information, some of which would not be possible through the use of simplex verb forms alone. In the case of the past tense auxiliary use of *-rɨ*, this enables the formation of the recent past perfective construction. In order to encode a combination of both the recent past tense and the perfective aspect, the auxiliary *-rɨ* is used to host the tense information whilst the main verb hosts the aspectual information. Although the final trees are structurally identical, the different processing strategies that are employed in the parsing of the

forms also provides support for the analysis of the past tense marker *áá-* as introducing fixed predicate-argument structure.

simplex and compound constructions are reflected in the different steps that are taken in the establishment of the propositional structure and the tense-aspect information encoded in each tree.

To summarise, in its past tense usage parsing the auxiliary *-rɨ* results in the construction of a fixed subject node and a fixed predicate node annotated with a metavariable placeholder. Whilst the auxiliary *-rɨ* does not make any tense or aspect contribution to the proposition, it can be inflected for past tense by the morpheme *áá-*. In the recent past perfective construction it appears alongside a main verb form, which is inflected for perfective aspect by the suffix *-ire*. The next section examines the copula function of *-rɨ* in the present future tense.

5.4.2 General present copula use of *-rɨ*

The second use of *-rɨ* discussed here is its function as a basic copula in present tense constructions (see section 3.2.7 for further details). The primary function of *-rɨ* in this context is to connect the subject of a sentence with a predicate. In this usage I consider *-rɨ* to be responsible for the construction of a fixed subject node and a fixed predicate node annotated with the metavariable Fo(**BE**). I also analyse *-rɨ* as introducing a present tense interpretation which is represented by the annotation Tns(PRESENT) at the root node. The lexical entry for the copula use of *-rɨ* is shown in (470) below.

(470) Lexical entry for *-rɨ* (present tense copula use)

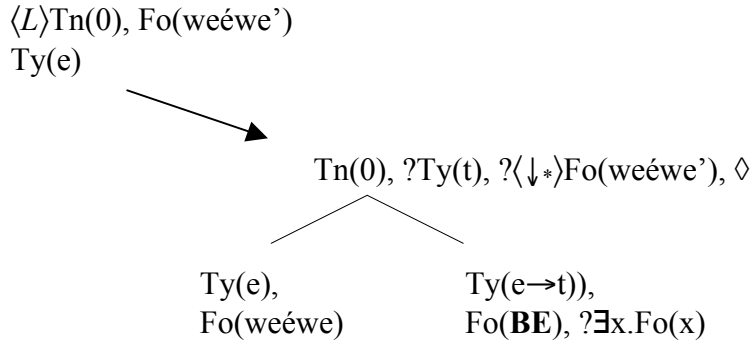
```
-rɨ   IF      ?Ty(t), ⟨↓*⟩⊥
      THEN    IF      ⟨↓1*⟩⟨↓0⟩Ty(e)
              THEN    put(Tns(PRESENT)); make(⟨↓0⟩); go(⟨↓0⟩);
                      put(?Ty(e)); go(⟨↑0⟩);
                      make(⟨↓1⟩); go(⟨↓1⟩);
                      put(Ty(e→t)), Fo(BE), ?∃x.Fo(x))
                      go(⟨↑0⟩);
                      …
              ELSE    abort
      ELSE    abort
```

As the lexical entry above demonstrates, in its copula use, *-rɨ* has a ?Ty(t) node as its trigger. An additional condition on its parsing is that there must be no fixed structure present in the tree at the point at which *-rɨ* is encountered (?Ty(t), [↓]⊥). The second IF clause introduces an additional condition for the parsing of *-rɨ*, which is the presence of a locally unfixed node. This reflects the fact that *-rɨ* must be prefixed by a subject marker. When these conditions are satisfied, parsing *-rɨ* results in the projection of a fixed subject node and a fixed predicate node annotated with the metavariable Fo(**BE**). This analysis follows that provided by Cann et al. (2005b) and Cann (2006; 2007) for the English copula *be*, under which the metavariable ?Ty(t), [↓]⊥ is the main predicate of the clause and is restricted in terms of possible substituents. The stages in parsing an utterance shown in (471) are presented below.

(471) weéwe ú-rɨ mʉ-kufi
2nd sg.PP SM2nd sg-AUX 1-short
'You are short'

With the initial NP projected onto a LINK structure constructed in parallel to the main tree, parsing the auxiliary *-rɨ* results in the projection of a fixed subject node and a fixed predicate node. This can be seen on examination of the tree in (472).

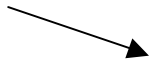
(472) Parsing: *weéwe ú-rɨ* …



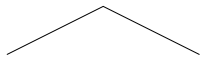
Parsing the adjective *mʉkufi* 'short' results in the projection of an unfixed node from the Ty(e→t) predicate node. This can be seen in the tree in (473) below.

(473) Parsing: *weéwe ú-r~~i~~ m~~u~~kufi*…

⟨*L*⟩Tn(0), Fo(weéwe')
Ty(e)



Tn(0), ?Ty(t), ?⟨↓∗⟩Fo(weéwe'),



Ty(e), Fo(weéwe)

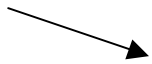
Ty(e→t), Fo(**BE**), ?∃x.Fo(x)

Fo(m~~u~~kufi')

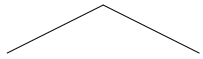
The information from *m~~u~~kufi* 'short' is projected onto an unfixed node. This enables the substitution of the formula metavariable Fo(**BE**) with a full formula value. In the current derivation Fo(**BE**) is updated to the full formula value Fo(mukufi), as can be seen in the tree in (474) below.

(474) Parsing: *weéwe úr~~i~~ m~~u~~kufi*

⟨*L*⟩Tn(0), Fo(weéwe')
Ty(e)



Tn(0), Ty(t) Fo(weéwe')(m~~u~~kufi'), ◊



Ty(e), Fo(weéwe)

Ty(e→t)), Fo(m~~u~~kufi')

With all of the requirements satisfied, the information is compiled up the tree. The link structure ensures the flow of information between the two trees, whilst the predicate metavariable Fo(**BE**) has received update to a full formula value in the form of the predicate Fo(m~~u~~kufi'). The third use of the auxiliary -*r~~i~~*, where it forms part of the future tense infinitive-auxiliary construction, is presented in section 5.4.3.

5.4.3 General future tense usage of *-rɨ*

The final use of the auxiliary *-rɨ* addressed in this chapter, is its use in the general future tense. The general future tense is formed through the combination of an infinitival verb form and the auxiliary *-rɨ*. In its future tense usage, *-rɨ* is not inflected for temporal or aspectual distinctions. In declarative main clauses, the infinitival verb consistently precedes the inflected form of *-rɨ*, as can be seen in (475) below.[75]

(475) jót-a á-rɨ maaji mpolɨ
gather-FV SM1-AUX 6.water later
'S/he will get water later'

Following on from the analysis provided for *-rɨ* in its past tense use, I propose an analysis in which *-rɨ* is responsible for the introduction of a fixed subject node and a fixed predicate in its future tense use. I also argue that the analysis under which the infinitival verb form is projected onto an unfixed predicate node, as was presented for the immediate future tense, can be extended to the general future tense.

There is no dedicated future tense morphology present in the general future tense construction. As such, I propose that the general future tense interpretation is the result of parsing *-rɨ* in the presence of an unfixed predicate node. The future tense interpretation is therefore found only in contexts in which another element (an unfixed node) is present in the parse. Such an analysis can subsequently be used to account for the past and present tense usage of *-rɨ* in other contexts. The details of this analysis are outlined below.

Declarative main clauses in the general future tense exhibit the infinitive-auxiliary order. As with the analysis of the immediate future tense presented above, I propose that in the general future tense, the lexical trigger for the infinitival verb form is an unfixed predicate node introduced via the rule of PREDICATE ADJUNCTION (defined in

[75] Interrogative and negative constructions, as well as relative and certain types of subordinate clauses exhibit auxiliary-infinitive in both the immediate future and general future tenses. For further examples of these auxiliary-infinitive construction types see section 3.4. The analysis of these alternation contexts is the focus of Chapter 6.

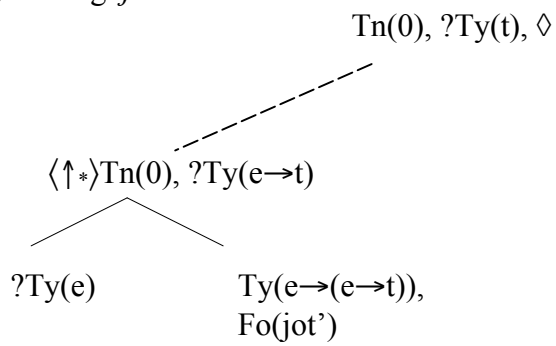
(450)). Parsing the infinitival verb form results in the annotation of this unfixed predicate node with the lexico-semantic information encoded by the verb. In the case of a transitive predicate such as *jóta* 'collect', I also argue that parsing the infinitive licenses the construction of an object argument node and a Ty(e→(e→t)) predicate node. The preliminary lexical entry for the infinitival verb form *jóta* 'collect' is shown in (476) below.

(476) Lexical entry for the infinitive *jóta* (version 2)

jóta	IF	?Ty(t), $\langle\downarrow^*\rangle$?Ty(e→t)
	THEN	go($\langle\downarrow^*\rangle$); make($\langle\downarrow_1\rangle$); go($\langle\downarrow_1\rangle$);
		put(Ty(e→(e→t)), Fo(jot'));
		go($\langle\uparrow_1\rangle$); make($\langle\downarrow_0\rangle$); go($\langle\downarrow_0\rangle$); put(?Ty(e));
		go($\langle\uparrow_0\rangle$);
		…
	ELSE	abort

As can be seen on examination of the lexical entry above, the infinitive projects a predicate node and, in the case of a transitive predicate such as *jota* 'collect', an object argument node. However, it does not project a subject node, reflecting the fact that the interpretation of the subject is not provided by the infinitival verb form. The tree that results from parsing the infinitive can be seen in (477) below, where the underspecified tree node relation represented by the unfixed predicate node dominates the transitive Ty(e→(e→t)) node.

(477) Parsing: *jóta* …



The tree above shows the projection of the unfixed Ty(e→t)) predicate node, which in turn dominates a Ty(e→(e→t)) predicate node and an object argument node.

Whilst the address of the Ty(e→t) predicate node is unfixed in relation to the top node (represented by the annotation ⟨↑∗⟩Tn(0)), the Ty(e→(e→t)) predicate node is fixed in relation to this unfixed node. This reflects the fact that whilst the relationship between the predicate node and the root node is not known at this early stage in the derivation, the relation between these two predicate nodes is known from the outset since they are both projected by the verb form *jóta*.

Following the parsing of the infinitive verb form, the subject marker, which is obligatorily present on the auxiliary, projects a locally unfixed node annotated with a restricted metavariable. The next element to be parsed is the auxiliary *-rɨ*. In line with the analysis I have presented for *-rɨ* and the other auxiliaries so far in this chapter, I propose that parsing the auxiliary *-rɨ* results in the projection of fixed minimal predicate-argument structure. Specifically, this involves the projection of a fixed subject node and a fixed predicate node. In order to capture the future tense interpretation associated with the general future tense infinitive-auxiliary constructions, I claim that the general future tense interpretation follows from parsing *-rɨ* in the presence of the unfixed predicate node. This can be seen in the lexical entry for the future tense use of *-rɨ*, shown in (478) below.

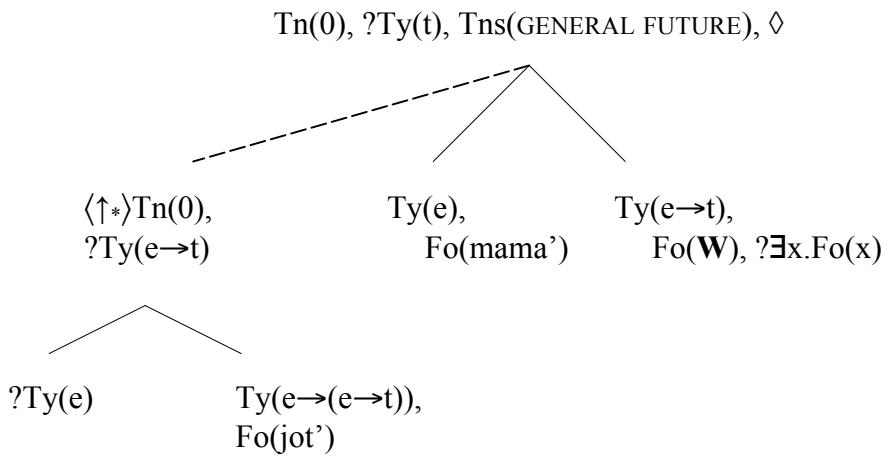
(478) Lexical entry for *-rɨ* (in its future tense use)

-rɨ	IF	?Ty(t), ⟨↓*⟩?Ty(e→t)
	THEN	put(Tns(GENERAL FUTURE));
		make(⟨↓$_0$⟩); go(⟨↓$_0$⟩); put(?Ty(e)); go(⟨↑$_0$⟩); make(⟨↓$_1$⟩);
		go(⟨↓$_1$⟩); put(Ty(e→t), Fo(**W**), ?∃x.Fo(x));
		go(⟨↑$_1$⟩)
		…
	ELSE	abort

In its future tense use, the auxiliary *-rɨ* has a requirement for a proposition (?Ty(t)) and an unfixed predicate node (⟨↓*⟩?Ty(e→t)) as its trigger. I propose that in the presence of this processing condition, parsing the auxiliary *-rɨ* results in the introduction of the general future tense interpretation to the clause (represented by the annotation Tns(GENERAL FUTURE) at the root node), as well as the construction of

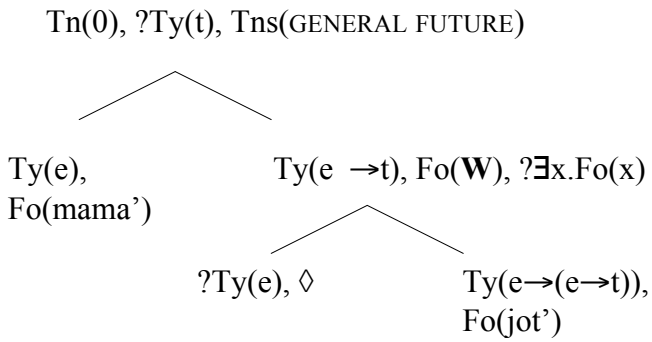
a fixed subject node and a fixed predicate node. The predicate-structure that results from parsing the infinitive and the inflected auxiliary is shown in (479) below.

(479) Parsing: *jóta a-rɨ…*



Following the introduction of fixed predicate-argument structure, the unfixed predicate node receives a fixed tree node address via the process of MERGE. The metavariable on the predicate node can receive immediate interpretation from the lexico-semantic information encoded in the infinitival verb form. The resulting tree is shown in (480) below.

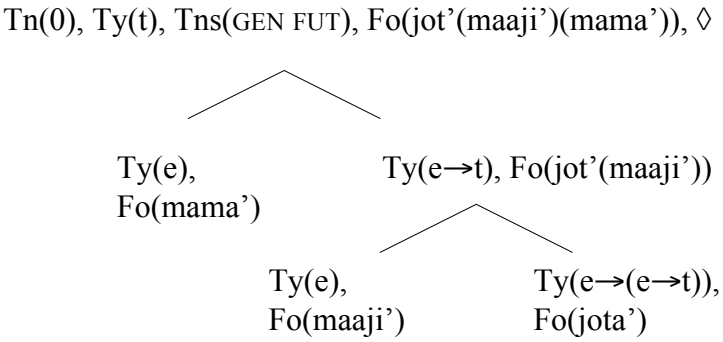
(480) Parsing: *jóta arɨ…*



The pointer moves to the Ty(e) node via the rule of ANTICIPATION. This is based on the intuition that the introduction of a transitive predicate gives rise to the expectation for an object argument. With the pointer at the ?Ty(e) object node, parsing the NP object provides the interpretation for the object argument node and

results in the annotation of this node with the formula value Fo(maaji'). With all of the requirements satisfied, the information is compiled up the tree. A snapshot of the final stage in the derivation is shown in (481) below.

(481) Parsing: *jota ar~~i~~ maaji*



I argue that the analysis outlined here is appropriate for capturing the properties of the future tense infinitive-auxiliary construction, which is formed using *-r~~i~~*. In section 5.3 above, I claimed that the future tense interpretation in the immediate future tense construction stems from the auxiliary *-íise*. In the current section I have argued that the general future tense interpretation stems from the auxiliary *-r~~i~~*, although in this instance the temporal contribution is the result of parsing *-r~~i~~* in the presence of an unfixed predicate node in the tree under construction. That the future tense contribution of *-r~~i~~* is dependent on an unfixed predicate node reflects the fact that the future tense interpretation is found only in instances in which *-r~~i~~* is used in conjunction with an infinitival verb form. This sensitivity to the context reflects the fact that *-r~~i~~* is used in a number of different tenses. Such an analysis is possible since it is only in its use in the future tense that *-r~~i~~* is used in conjunction with the infinitive.

The analysis presented above is based on the assumption that the unfixed predicate node is not locally unfixed. Support for a locally unfixed predicate node analysis would come from the observation that additional structure cannot be inserted between the infinitive and the auxiliary – as such, the infinitive must be interpreted locally. However, such an analysis is untenable since the projection of the infinitive

onto a locally unfixed node would result in the co-occurrence of two locally unfixed nodes at the point at which the information from the subject marker is parsing (and projected onto a locally unfixed node). The projection of the subject marker onto a locally unfixed node is otherwise well-motivated for Rangi and other Bantu languages (see Marten and Kempson (2006); Kempson et al. (2011b); Marten and Kula (2011)). As such, I do not wish to amend the analysis of Rangi subject markers.

An alternative analysis would be to propose a characterisation of the unfixed predicate node under which it is defined as $\langle\uparrow^{1}\rangle\langle\uparrow^{*}\rangle$Tn(0), ?Ty(e→t). Such a characterisation reflects the observation that unfixed predicate nodes will always assume the functor position. With the unfixed predicate node characterised as $\langle\uparrow^{1}\rangle\langle\uparrow^{*}\rangle$, it is distinguishable from other unfixed nodes which have modalities $\langle\uparrow^{0}\rangle\langle\uparrow_{1}{}^{*}\rangle$ or $\langle\uparrow^{*}\rangle$. However, I do not pursue such an analysis since the analysis I propose for the alternation contexts in Chapter 6, is crucially dependent on the underspecified characterisation of unfixed predicate nodes as unfixed $\langle\uparrow^{*}\rangle$ nodes. In Chapter 6, I propose an analysis in which the auxiliary-infinitive order that is found in the alternation contexts is triggered by the projection of the left-most element onto an unfixed node. By characterising unfixed predicate nodes in similar terms as other unfixed elements (whereby they are all projected onto nodes which have a $\langle\uparrow^{*}\rangle$ relation to the root node), the infinitive-auxiliary alternation is regularly predicable. The ordering infinitive-auxiliary or auxiliary-infinitive is therefore based on the prohibition of two unfixed nodes of the same modality co-existing at any point in the derivation.

One strategy to overcome this issue would be to propose a modification to the architecture made available within DS. This modification would allow specific, well-defined annotations to be used to distinguish between two different unfixed nodes which are of the same modality and as such are identical with respect to tree node annotation. In other words, in order to avoid the co-occurrence of two unfixed nodes both annotated with $\langle\uparrow_{0}\rangle\langle\uparrow_{1}{}^{*}\rangle$ Tn(0), the type value annotations of these two unfixed nodes would be considered sufficient to prevent them from collapsing onto

each other. This would mean that rather than being dependent solely on the tree node address, the framework would make it possible to distinguish between different type specifications associated with unfixed nodes – such as Ty(e) or (Ty(e→t)) – as well as modalities. In the case of Rangi, this would allow the presence of a locally unfixed node annotated with information from the subject marker to exist at the same time as a locally unfixed Ty(e→t) node annotation with information from the clause-initial infinitive.

A drawback of this proposal is that it would constitute a modification of the logic of tree nodes and the definition of the relations that hold between them. Furthermore, conceptually it is not clear why type annotations could be used to distinguish between nodes but formula annotations are not sufficient, particularly given their shared status as tree node decorations. A further problem with this proposed modification to the framework is that the type values would only distinguish between different types of unfixed nodes. However, unfixed nodes are not identified as a special class of tree nodes or considered distinct from fixed nodes. As a result, this proposed modification would have to be extended to fixed nodes as well as unfixed nodes. The ramifications for the DS framework, and past and future analyses which are based on unfixed nodes and their associated modalities, would therefore be far-reaching. For example, previous analyses of phenomena such as scrambling in Korean (Kempson and Kiaer 2010) and object marking in Bantu (Marten et al. 2008) are based on assumptions of the unavailability of more than one unfixed node of the same modality being present at any given point in a derivation. Finally, for the reasons outlined above, the ability to distinguish between unfixed nodes on the basis of their type specification would mean that the analysis I propose for the alternation contexts in Chapter 6 would not be viable.

I therefore propose that no alteration of the unfixed node definition is necessary, and that the restriction on the co-occurrence of unfixed nodes can be seen to account for the alternation contexts, which are discussed in Chapter 6. The data from Rangi provide empirical evidence in support of a locally unfixed node analysis in terms of

the locality of interpretation, as well as providing evidence in support of the unfixed node analysis in terms of the restrictions on the inversion contexts.

With all of the uses of *-rɨ* discussed, the lexical entry for *-rɨ* in all of its uses – in the recent past, in the general future and as a predicative copula in the present – is shown in (482) below.

(482) Lexical entry for *-rɨ* (in all uses discussed thus far)

```
-rɨ   IF      ?Ty(t),
      THEN    IF      ⟨↓⟩∃x.Tn(x)
              THEN    abort
              ELSE    IF      ⟨↓*⟩?Ty(e→t)
                      THEN    put(Tns(GENERAL FUTURE)); make(⟨↓0⟩);
                              go(⟨↓0⟩); put(?Ty(e)); go(⟨↑0⟩); make(⟨↓1⟩);
                              go(⟨↓1⟩); put(Ty(e→t), Fo(W), ?∃y.Fo(y));
                              go(⟨↑1⟩)
                      ELSE    IF      ⟨↓1*⟩⟨↓0⟩Ty(e)
                              THEN    put (Tns(PRESENT));
                                      make(⟨↓0⟩); go(⟨↓0⟩); put(?Ty(e));
                                      go(⟨↑0⟩); make(⟨↓1⟩); go(⟨↓1⟩);
                                      put(Ty(e→t)), Fo(BE), ?∃x.Fo(x));
                                      go(⟨↑0⟩);
                              ELSE    IF      Tns(RECENT PAST)
                                      THEN    make(⟨↓0⟩); go(⟨↓0⟩);
                                              put(?Ty(e)); go(⟨↑0⟩);
                                              make(⟨↓1⟩); go(⟨↓1⟩);
                                              put(Ty(e→t)), Fo(W)
                                              ?∃x.Fo(x)); go(⟨↑0⟩)
                                      ELSE    abort
      ELSE    abort
```

The complexity of the lexical entry for *-rɨ* reflects the distinct processing conditions in which it can be parsed and the different lexical actions that are induced in each instance. The order in which the elements appear in the lexical entry is also crucial. In all of its uses discussed here, the trigger for parsing *-rɨ* is a ?Ty(t) node. The first IF clause introduces the first parsing condition. In the absence of any fixed structure (represented by ⟨↓⟩∃x.Tn(x) and the action abort), one of two additional conditions can be fulfilled. Firstly, in the presence of an unfixed predicate node (represented by

⟨↓*⟩?Ty(e→t) in the IF clause), parsing *-rɨ* results in the introduction of the general future tense interpretation. This is represented by the annotation of the root node with Tns(GENERAL FUTURE). The subsequent lexical actions see the construction of a fixed subject node and a fixed predicate node annotated with the metavariable Fo(**W**).

Secondly, in the absence of any fixed structure but the presence of a locally unfixed node, parsing *-rɨ* results in the introduction of a present tense interpretation represented by the annotation Tns(PRESENT) at the root node. It then also results in the projection of a fixed subject node and a fixed predicate node annotated with the metavariable Fo(**BE**). The third possible parsing context is found when the recent past tense annotation is present at the root node at the point at which *-rɨ* is being parsed. This happens only in instances in which *-rɨ* is preceded by the recent past tense morpheme *áá-*, which also results in the construction of a fixed subject node and a fixed predicate node (meaning that the absence of fixed structure is not part of the trigger for this use of *-rɨ*). Although in its recent past tense use a fixed subject node and a fixed predicate node have already been introduced by the past tense marker, I also analyse *-rɨ* in its past tense use as projecting a fixed subject node and a fixed predicate node annotated with a metavariable.

An interesting feature of the lexical entry of *-rɨ* is that in each of the three parsing contexts discussed here, it projects a fixed subject node and a fixed predicate node. The slightly different triggering conditions that are present in each of its uses however, reflect the different tense-aspect interpretations associated with each of its uses. In the presence of an unfixed predicate node, *-rɨ* is responsible for the introduction of the general future tense interpretation. Likewise, in its present tense predicative use, *-rɨ* is responsible for the introduction of the present tense interpretation. It is only in its recent past tense use that the temporal information is introduced by another element, i.e. by the recent past tense marker *áá-*, which is prefixed onto *-rɨ*. Another difference is that its use in both the recent past tense and general future tense result in the introduction of a generalised metavariable on the

predicate node (Fo(**W**)). In its predicative use as a copula however, parsing *-rɨ* results in the introduction of the BE metavariable (Fo(**BE**)). Although Fo(**BE**), like other metavariables, requires update to a full formula value before the parse is complete.[76] In order to reflect that it is a predicate metavariable with a restriction on the types of predicate that can substitute for it, the metavariable is written with the content of *be* as in Fo(**BE**) (see Cann et al. (2005b)).

To summarise, infinitival verb forms and verb stems in inflected verb forms can often not be distinguished morphologically. As such, I have proposed an analysis under which the distinct lexical actions which are induced in each instance are the result of the processing conditions and the distinct lexical triggers with which their parsing is associated. Such an analysis – under which the lexical actions induced are similar – reflects their shared verbal properties, whilst the differences in the lexical triggers reflect the distinct contexts in which they are parsed. The similarities and differences between verb stems in inflected verb forms and infinitives can be seen in Table 23 below.

Table 23: DS characteristics of Rangi verb stem in inflected verb forms and infinitives

	Lexical trigger	**Lexical actions**
Verb stem	Query type *e→t* node ?Ty(e→t)	Build fixed subject node Build fixed predicate node Provide full predicate formula value annotation
Infinitive	Query type t and an unfixed predicate node ?Ty(t), ⟨↓*⟩?Ty(e→t)	Annotate unfixed predicate node Build predicate node(s) as determined by the valency of the verb Build argument node(s) as determined by the valency of the verb

[76] The exception to this is the metavariable **WH**, which does not require substitution to a full formula value before the derivation is complete (see Bouzouita (2008b) and Chatzikyriakidis (2010)).

As can be seen on examination of Table 23 above, the lexical triggers for inflected verb stems and infinitival verb forms differ slightly. Whilst the trigger for verb stems is a query type *e→t* node, for infinitives it is a query type *t* node and the presence of an unfixed type *e→t* node. This difference is motivated by the fact that when the infinitive appears before the auxiliary, it is parsed in the presence of no fixed structure and, as such, no fixed ?Ty(e→t) node is present in the tree under development. The lexical actions induced also differ in that the verb stems result in the construction of fixed predicate-argument structure, the valency of which is determined by the verb and a full formula annotation of the predicate node. The lexical actions induced by the infinitival verb form result in the annotation of the unfixed predicate node (which is introduced via the PREDICATE ADJUNCTION rule). Parsing both the infinitive and the verb stem licenses the construction of additional predicate nodes and their associated object argument node as determined by the valency of the verb. In the case of the infinitival verb form however, these nodes are still dominated by an unfixed tree node relation.

The similarities can therefore be seen to be semantic, reflecting the verbal properties shared by both infinitives and verb stems in inflected verb forms. The differences however, are structural and reflect the different parsing conditions in which these verb types are found. A sample derivation showing the parsing of a general future tense construction is shown in 5.4.4 below.

5.4.4 Sample derivation: *tereka varɨ mboha*

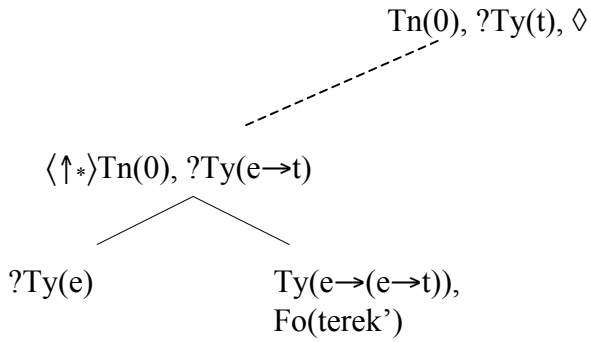
The assumptions I make for parsing Rangi utterances are exemplified in the parse presented below. Specifically, I model the infinitive as projected onto an unfixed predicate node introduced via the rule of PREDICATE ADJUNCTION. The subject marker projects a locally unfixed argument node and provides a restriction on the interpretation of the subject argument in terms of noun class or person and number. Parsing *-rɨ* results in the projection of a fixed subject node and a fixed predicate node, which enables the fixing of the tree node address for the subject information. The fixed predicate node receives interpretation from the lexico-semantic information provided by the infinitival verb. On the basis of these assumptions and

the analysis outlined above, the stages of the sample derivation of the general future utterance in example (483) are outlined below.

(483) térek-a vá-rɨ mboha
cook-FV SM2-AUX 10.vegetables
'They will cook vegetables'

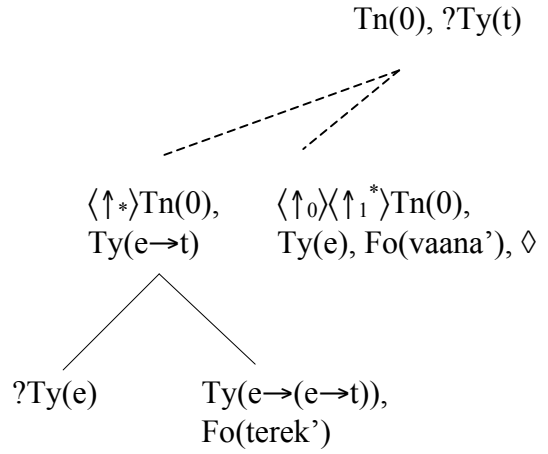
Parsing the infinitival verb results in the annotation of an unfixed predicate node introduced by the rule of PREDICATE ADJUNCTION. The effects of this can be seen in (484) below.

(484) Parsing: *téreka…*



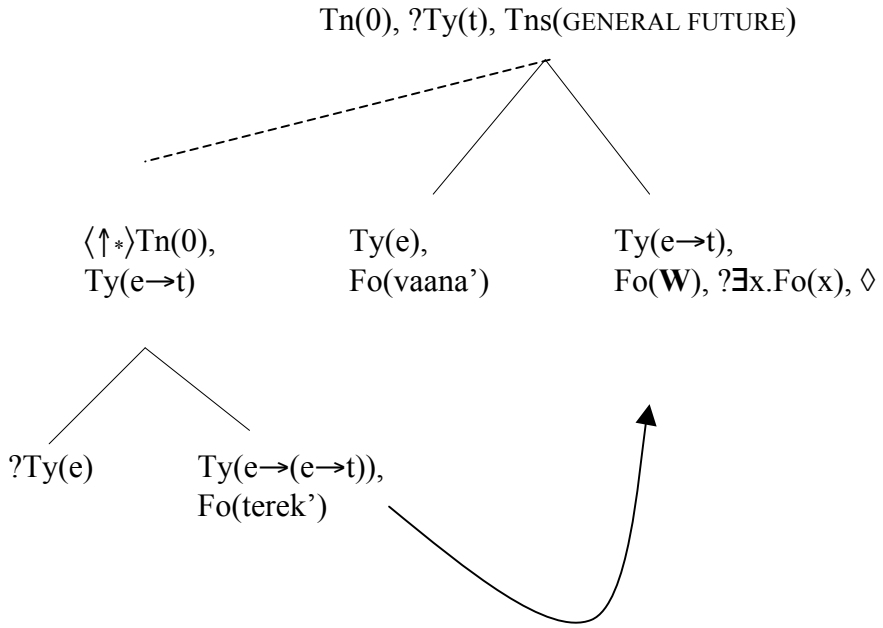
Parsing the subject marker on the auxiliary results in the projection of a locally unfixed node. The interpretation of the subject is restricted by the noun class information provided by the subject marker and is substituted with an appropriate term from the context, such as *vaana* 'children', which respects this restriction. The resulting tree can be seen in (485) below.

(485) Parsing: *téreka va-…*



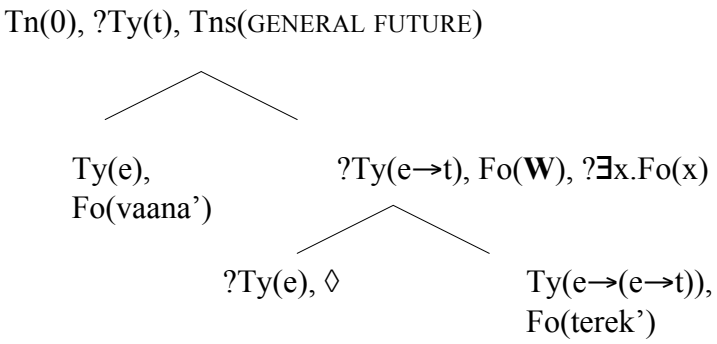
Parsing *-rɨ* in the presence of an unfixed node results in the introduction of the general future tense interpretation, represented by the annotation Tns(GENERAL FUTURE) at the root node. Parsing the auxiliary *-rɨ* also results in the projection of a fixed subject node and a fixed predicate node. The presence of a fixed subject node enables the subject information Fo(vaana') to receive a fixed tree node address, fixing it as the logical subject of the clause. The effects of parsing *-rɨ* can be seen in the tree in (486) below.

(486) Parsing: *téreka várɨ…*



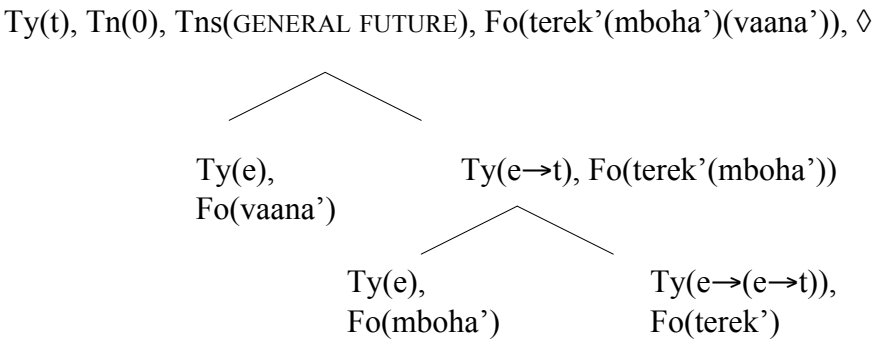
The information from the infinitive on the unfixed predicate node enables the interpretation of the fixed predicate node, allowing update of the metavariable placeholder to the full formula value Fo(terek'). The resulting tree is shown in (487) below.

(487) Parsing: *téreka vár~~ɨ~~...*



Parsing the object expression *mboha* provides the interpretation for the ?Ty(e) object node. With all of the requirements satisfied, the parse is complete. The final stage of the derivation can be seen in (488) below.

(488) Parsing: *téreka var~~ɨ~~ mboha* 'They cook vegetables'



In this way, when the infinitive is parsed in the presence of an unfixed predicate node, it annotates an unfixed Ty(e→t) node. Parsing the subject marker on the auxiliary results in the projection of a locally unfixed node annotated with a restricted metavariable. Parsing the auxiliary *-r~~ɨ~~* in the presence of the unfixed predicate node results in a general future tense interpretation of the clause and the annotation Tns(GENERAL FUTURE) at the root node. It also results in the

establishment of fixed predicate-argument structure, allowing the establishment of fixed tree node addresses for the unfixed subject node and the unfixed predicate node.

5.5 Summary

This chapter has presented formal analysis of Rangi auxiliary-based constructions from the perspective of the Dynamic Syntax framework. The analyses provided are based on a number of assumptions about Rangi basic clause structure which were provided in Chapter 4. Section 5.2 analysed the past tense auxiliary -*íja*, which I model as introducing a past tense interpretation to the clause, as well as being responsible for the introduction of a fixed subject node and a fixed predicate node. The introduction of fixed predicate structure by -*íja* is a formal reflex of the probable historical origin of this auxiliary (and perhaps all auxiliaries) in a main verb form. With verb stems also analysed as being responsible for the introduction of a fixed subject node and a fixed predicate node, this structural contribution reflects the historical connection between the two.

The chapter continued with an examination of the auxiliary -*íise* in section 5.3. I analyse -*íise* as being responsible for the construction of fixed predicate-argument structure. Since -*íise* is used solely in the immediate future tense, I consider it to be responsible for the introduction of an immediate future tense interpretation. This temporal contribution is represented by the annotation Tns(IMMEDIATE FUTURE) at the root node. In order to model the infinitive-auxiliary order found in the immediate future tense, I analyse the infinitive as being projected onto an unfixed predicate node introduced by the rule of PREDICATE ADJUNCTION. A formal definition of PREDICATE ADJUNCTION as a rule which derives an unfixed ?Ty(e→t) node from a ?Ty(t) was also provided. The central claim I make is that parsing the infinitival verb form results in the projection of the lexico-semantic information with which it is associated onto an unfixed predicate node introduced via the rule of PREDICATE ADJUNCTION.

Following application of the PREDICATE ADJUNCTION rule and parsing the infinitive, the inflected auxiliary form is parsed in accordance with the basic rules for Rangi clause structure adopted in this study thus far. I analyse the auxiliary *-rɨ* as responsible for the introduction of a fixed subject node and a fixed predicate node. I propose that the past tense interpretation associated with the use of *-rɨ* in the recent past perfective construction is the result of the past tense inflection on the auxiliary in the form of the prefix *áá-*. I further claim that the use of the auxiliary *-íja* enables the encoding of recent past tense and perfective aspect, the combination of which would not be possible without the use of the auxiliary. This is because the morphemes used in simplex verb forms to encode these temporal and aspectual distinctions compete for the same slot in the verbal template.

In its future tense usage, parsing *-rɨ* in the presence of an unfixed predicate node results in the introduction of a general future tense interpretation (Tns(GENERAL FUTURE)). In a infinitive-auxiliary construction, the introduction of the fixed predicate-argument structure by the auxiliary allows the fixing of the tree node address of the predicate node, and the annotation of this node with the information from the infinitival verb form. As a result, I claim that the future tense interpretation that is associated with the infinitive-auxiliary construction is introduced by the auxiliary – general future tense in the case of the auxiliary *-rɨ* and immediate future tense with the auxiliary *-íise*.

Whilst the temporal contribution to the clause made by the auxiliaries differs in each instance, the analyses are unified by being responsible for the introduction of fixed minimal predicate-argument structure. In addition to the structure contribution the auxiliaries make, the auxiliary *-íja* introduces the distant past temporal information, whilst the auxiliary *-íise* introduces an immediate future tense interpretation. In the recent past perfective construction, the recent past tense interpretation is introduced through the presence of the recent past prefix *áá-* on the auxiliary. In the general future tense the temporal interpretation follows from parsing *-rɨ* in the presence of an

unfixed node. The analyses presented here are dependent on the proposal of a monoclausal analysis for the auxiliary constructions.

This chapter has provided a formal modelling of the auxiliary constructions found in Rangi. I have shown that the temporal input made by the auxiliaries differs in each context and is, in some instances, also dependent on other elements in the clause for its interpretation. In structural terms however, these auxiliaries are all responsible for the introduction of fixed minimal predicate-argument structure. This chapter has aimed to provide a formal modelling of the marked infinitive-auxiliary construction found in Rangi.

With a formal characterisation of the auxiliary-based constructions and the future tense infinitive-auxiliary order provided, the next chapter examines the alternation contexts. These are the syntactic environments in which the future tense is associated with an auxiliary-infinitive order – the opposite order from that which has been presented in the current chapter. These alternation contexts include future tense constructions which are introduced by wh-elements, instances of sentential negation, focus-introducing cleft constructions, relative clauses and subordinate clauses introduced by *jooli* 'how' and *kooni* 'if'. These alternation contexts and their proposed Dynamic Syntax modelling comprise the focus of Chapter 6.

6 The alternation contexts: modelling Rangi auxiliary-infinitive order

6.1 Introduction

With the infinitive-auxiliary order modelled in Chapter 5, the present chapter examines the alternation contexts – the syntactic environments in which the future tense constructions exhibit auxiliary-infinitive order. Whilst declarative main clauses in both the immediate future tense and the general future tense exhibit infinitive-auxiliary order, the auxiliary appears before the infinitive when the future construction is:

i) preceded by a wh-element,
ii) part of *sí...tukʉ* sentential negation,
iii) part of a relative clause,
iv) part of a cleft construction, or
v) preceded by the subordinator *jooli* or *kooni*.

In the contexts outlined above, the future interpretation of the clause is maintained despite the preverbal position of the auxiliary. Building on the analysis provided in Chapter 5, the formal modelling of these alternation contexts comprises the focus of the current chapter.

The claim I make is that, rather than being associated with a disjunctive set of elements, the auxiliary-infinitive order is found in a coherent set of processing environments. I propose that Rangi utterances containing wh-interrogatives, negative markers, relative clauses, cleft constructions and the subordinators *jooli* and *kooni*, can be modelled using an unfixed node. As such, I claim that the auxiliary-infinitive order is found in processing contexts which involve the presence of an unfixed node as an instantiation of structural underspecification. In contrast, the infinitive-auxiliary order is found in the absence of the unfixed node trigger.

I further propose that the alternation between infinitive-auxiliary and auxiliary-infinitive order is predictable on the basis of a basic constraint that is operative in the

DS framework. This constraint prohibits the co-existence of two unfixed nodes of the same modality at any point within a derivation. This independent constraint arises from the fundamental DS architecture under which two unfixed nodes of the same modality have identical tree addresses and, as such, will collapse onto each other. The modelling of left periphery elements, such as a wh-phrase, using an unfixed node therefore excludes the availability of an unfixed node parsing strategy for the infinitival verb form before the establishment of a fixed tree node address for the left peripheral element. This analysis, as will be shown, crucially depends on the formalisation of the infinitive-auxiliary order adopted in Chapter 5, in which I model the infinitive as decorating an unfixed predicate node with an unspecified tree node address characterised as $\langle\uparrow^*\rangle$Tn(0).

This chapter provides formal modelling of the alternation contexts, substantiating the claim that the alternation contexts involve the construction of an unfixed node. Analyses within the Dynamic Syntax framework for Rangi wh-interrogatives, sentential negation, relative clauses, cleft constructions and subordinate clauses are presented in turn. The analyses I propose for these different construction types are unified by the proposal of the presence of an unfixed node as part of their processing strategy and by the proposal that it is the presence of this unfixed node which triggers auxiliary-infinitive order.

For the analysis of wh-interrogatives, I propose that the wh-element is projected onto an unfixed node introduced by *ADJUNCTION, as has been seen throughout DS analyses of wh-interrogatives (see Kempson et al. (2001) and Cann et al. (2005b)). In *sí…tukʉ* negative future constructions I propose that the negative marker *sí* is projected on an unfixed predicate node introduced by the rule of PREDICATE ADJUNCTION. This reflects its status as a copula and the fact that its relation to the eventual tree is not fixed at this early stage in the derivation. The analysis I provide for relative clauses is one under which the head noun and relative clause annotate separate trees constructed in parallel. These two trees are connected via a LINK structure and the presence of a shared term in each of the trees. The copy of the head

noun, which is the shared term in the main tree, is introduced by the agreement marker on the relative pronoun and projected onto an unfixed node. I also analyse cleft constructions as involving a LINK relation with a copy of the NP expression in the clefted element projected onto an unfixed node.

I also analyse subordinate clauses introduced by *jool~~i~~* and *kooni* using an unfixed node analysis. However, following Gregoromichelaki (2006), I propose that these clause types can best be modelled by reference to an unfixed situation argument node, introducing a more fine-grained distinction between argument types. I analyse the subordinators *jool~~i~~* and *kooni* as giving rise to the establishment of a LINK relation in which the matrix clause and the subordinate clause are connected through a shared situation argument. In each of the alternation contexts, I analyse the auxiliary as introducing fixed minimal predicate-argument structure whilst the infinitive provides a full formula value for the predicate node and may lead to the establishment of further predicate nodes in the case of transitive and ditransitive predicates. I model the future tense interpretation which is associated with all of these constructions as being the result of parsing the auxiliary – either *-r~~i~~* or *-íise* – in the presence of an unfixed node. The analyses are presented in turn below.

6.2 Wh-interrogatives

Left-peripheral wh-expressions in content interrogatives are analysed in the Dynamic Syntax framework as involving the projection of an unfixed node. In English for example, sentence-initial wh-phrases are taken to project a metavariable **WH**, which annotates an unfixed node (Kempson et al. 2001:150-189; Cann et al. 2005b:153-154). Bouzouita (2008b) proposes a similar analysis for Medieval Spanish wh-question particles, for which she additionally employs the feature *Q* at the top node to identify the clause as interrogative.

Rangi future interrogative phrases which are formed using a wh-expression exhibit auxiliary-infinitive order. This includes both subject and object interrogative phrases, and covers the whole range of wh-expressions. Following Kempson et al. (2001), I analyse wh-elements in Rangi such as *ani* 'who' as being projected onto an

unfixed node. Following Bouzouita (2008b) and Chatzikyriakidis (2010), I analyse the wh-element as also introducing a **WH** metavariable and an interrogative feature *Q* into the semantic tree. The specialized formula metavariable **WH** is responsible for identifying the wh-element as interrogative. However, unlike other metavariables which require update to a full formula value before the derivation is complete, update to a full formula value is not obligatory for the creation of a well-formed utterance with the **WH** metavariable. Formally, this is captured by the fact that it is not accompanied by the requirement for update which would be specified as ?∃x.Fo(x). The interrogative feature *Q* appears as a diacritic at the root node and marks the clause as interrogative.

With the information made available by the wh-element projected onto an unfixed node, parsing the auxiliary results in the introduction of a fixed subject node and a fixed predicate node. This enables the identification of a fixed tree node address for the wh-element. Parsing the infinitive leads to the annotation of the predicate node with a full formula value and enables the construction of further predicate-argument structure as required. The steps of the derivation involved in parsing the interrogative utterance shown in example (489) are presented below.

(489) ani á-r~~i~~ r~~i~~n-a ~~i~~-h~~i~~ m~~i~~-r~~ii~~nga
who SM1-AUX open-FV DEM-4 4-beehive
'Who will open this beehive?'

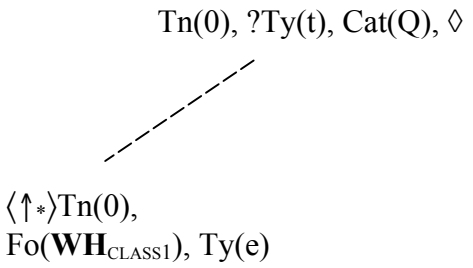
Parsing the wh-expression *ani* 'who' results in the annotation of the top node with the *Q* feature and the decoration of the unfixed node with the metavariable **WH**. This can be seen on examination of the lexical entry for *ani* 'who' shown in (490) below.

(490) Lexical entry for the interrogative pronoun *ani* 'who'

ani	IF	?Ty(t), $\langle\downarrow^*\rangle\bot$
	THEN	put(Cat(Q)); make($\langle\downarrow^*\rangle$); go($\langle\downarrow^*\rangle$);
		put((**WH**$_{\text{CLASS1}}$), Ty(e));
		go($\langle\uparrow_*\rangle$)
	ELSE	abort

As can be seen on examination of the lexical entry above, the wh-expression *ani* 'who' has a ?Ty(t) node and the presence of no fixed structure as its lexical trigger. If this condition is met, parsing *ani* results in the annotation of the root node with the interrogative feature *Q* and induces the projection of an unfixed node. The unfixed node is also annotated with the **WH** metavariable before the pointer returns to the root node. In the case of *ani* 'who', the potential substituents for the wh-expression are limited to class 1 nouns, i.e. human referents. In order to capture this restriction, I propose a restriction on the **WH** metavariable such that *ani* can only be substituted by a class 1 referent ($\mathbf{WH}_{\text{CLASS1}}$). In the case of plural human referents, the question word *valani* 'who (plural)' is used and possible substituents for *valani* would subsequently be restricted to class 2 – represented by the restricted metavariable $\mathbf{WH}_{\text{CLASS2}}$. The restriction of terms with which the metavariable can be identified is found only in the agreeing wh-elements *ani* 'who', *valani* 'who (pl)' and *-irikwi* 'which'. The structure which results from parsing *ani* can be seen in (491) below.

(491) Parsing: *ani*…



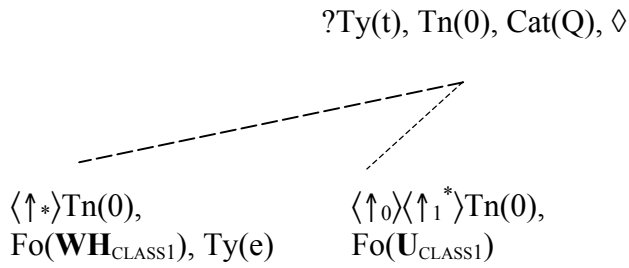
Following the annotation of the unfixed node with the information made available by the wh-expression, the tree can be further developed with content provided by the rest of the clause.

The analysis provided for the infinitive-auxiliary construction in Chapter 5 was one under which the infinitive was projected onto an unfixed predicate node introduced via the rule of PREDICATE ADJUNCTION. In the case of wh-interrogatives however, the presence of the unfixed node annotated with the wh-element prohibits the projection of an unfixed predicate node by the rule of PREDICATE ADJUNCTION since this would

contradict the prohibition on the co-occurrence of unfixed nodes of the same modality. I claim therefore, that following from this basic restriction on tree growth, the infinitive cannot be parsed after the wh-element which annotates an unfixed node. Instead the auxiliary appears immediately after the wh-element and significantly, before the infinitive, resulting in the auxiliary-infinitive order found in wh-interrogative clauses. I further claim that it is the presence of an unfixed node which triggers the auxiliary-infinitive order in all of the alternation contexts.

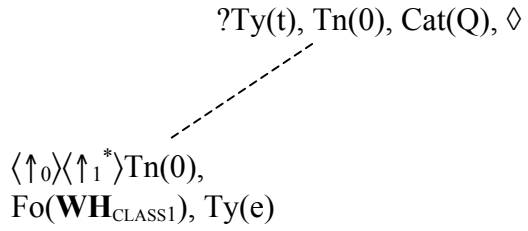
Returning to the utterance under consideration, parsing the subject marker on the auxiliary results in the projection of a locally unfixed node. This node is distinguished from the unfixed node onto which the wh-element is projected on the basis of its distinct modality. The locally unfixed node is annotated with the restricted metavariable Fo(U_{CLASS1}) as a result of the class 1 restriction introduced by the class 1 subject prefix *a-*. This can be seen in the tree shown in (492) below.

(492) Parsing: *ani a- ...*



The locally unfixed node introduced by the subject marker is interpreted against the background of the information annotating the unfixed node, which was introduced by the wh-element *ani* 'who'. With both representing class 1 nouns, the two unfixed nodes collapse, resulting in a locally unfixed node annotated with the formula value Fo(**WH_{CLASS1}**) as shown in (493) below.

(493) Parsing: *ani a- ....*



The next element to be parsed is the auxiliary. As was shown in Chapter 5, I consider the lexical trigger for parsing the auxiliary to be a ?Ty(t) node. With the pointer back at the ?Ty(t) node following the parsing of the subject marker, parsing the auxiliary results in the projection of a fixed subject node and a fixed predicate node annotated with a metavariable placeholder. The introduction of this fixed subject node enables the establishment of a fixed tree node address for the subject information, fixing Fo(**WH**$_{\text{CLASS1}}$) as the logical subject of the clause.

I further propose that parsing the auxiliary *-rɨ* or *-ɪise*, in the presence of an unfixed node, results in the introduction of the future tense interpretation. Whilst in the infinitive-auxiliary constructions seen in Chapter 5 this unfixed node was the unfixed predicate node onto which the infinitive was projected, in the current derivation the unfixed node is that onto which the wh-element is parsed. In order to capture the fact that a future tense interpretation results in both instances, I propose the addition of the presence of an unfixed argument node to the triggering conditions for parsing the auxiliary. Although parsing *-rɨ* results in the construction of a fixed subject node and a fixed predicate node in both instances, this extends the contexts in which *-rɨ* can be parsed to account for the auxiliary-infinitive construction. Significantly, in both instances, parsing *-rɨ* results in a future tense interpretation in the presence of the unfixed node (cf. the past tense and present tense use of *-rɨ* shown in section 3.2.7).

The updated lexical entry for the auxiliary *-rɨ*, which includes the presence of both an unfixed argument node (⟨↓*⟩?Ty(e)) and an unfixed predicate node (⟨↓*⟩?Ty(e→t)) as part of the lexical trigger, can be seen in (494).

(494) Lexical entry for the auxiliary *-rɨ* (in the general future tense)

```
-rɨ-   IF      ?Ty(t)
       THEN    IF      ⟨↓*⟩?Ty(e→t) |
                       ⟨↓*⟩?Ty(e)
               THEN    put(Tns(GENERAL FUTURE));
                       make(⟨↓0⟩); go(⟨↓0⟩); put(?Ty(e)); go(⟨↑0⟩);
                       make(⟨↓1⟩); go(⟨↓1⟩);
                       put(Ty(e→t), Fo(W), ?∃y.Fo(y));
                       go(⟨↑1⟩)
               …
       ELSE    abort
```

To account for the possibility of parsing *-rɨ* in the presence of either an unfixed predicate node or an unfixed argument node, I propose the use of the inclusive disjunction (|) (following Chatzikyriakidis (2010)). The inclusive disjunction indicates that either the first or the second part of the lexical trigger can hold for the lexical actions to be induced. The lexical trigger for the auxiliary *-rɨ* is therefore a ?Ty(t) node and the presence of either an unfixed predicate node or an unfixed argument node – the first being found in infinitive-auxiliary constructions and the second in auxiliary-infinitive constructions. The lexical actions induced by *-rɨ* then result in the introduction of the general future tense interpretation, which is represented at the root node by Tns(GENERAL FUTURE).

Such an analysis reflects the fact that the general future tense interpretation follows from parsing the auxiliary *-rɨ* in the presence of an unfixed node. In instances in which neither an unfixed predicate node nor an unfixed argument node is present, a non-future tense interpretation will result. The sensitivity of the future tense interpretation to the processing strategy is important, since it acts to restrict the possible instances in which a future tense interpretation is found. Significantly, it means that the auxiliary *-rɨ* alone is not responsible for the introduction of the future tense interpretation, but rather that the future tense interpretation is dependent on a certain set of parsing conditions. Any analysis must reflect this property in order to be able to account for the use of the auxiliary *-rɨ* in both future and non-future tenses.

An updated lexical entry for *-rɨ*, with the lexical actions which are induced upon parsing *-rɨ* in the general future tense, the recent past tense, its copula usage and the alternation contexts is shown in (495) below.

(495) Lexical entry for *-rɨ* (in all discussed uses)

```
-rɨ   IF      ?Ty(t),
      THEN    IF      ⟨↓⟩∃x.Tn(x)
              THEN    abort
              ELSE    IF      ⟨↓*⟩?Ty(e→t) |
                              ⟨↓*⟩?Ty(e)
                      THEN    put(Tns(GENERAL FUTURE))
                              make(⟨↓0⟩); go(⟨↓0⟩); put(?Ty(e));
                              go(⟨↑0⟩); make(⟨↓1⟩); go(⟨↓1⟩);
                              put(Ty(e→t), Fo(W), ?∃y.Fo(y));
                              go(⟨↑1⟩)
                      ELSE    IF      ⟨↓1*⟩⟨↓0⟩Ty(e)
                              THEN    put(Tns(PRESENT); make(⟨↓0⟩);
                                      go(⟨↓0⟩); put(?Ty(e)); go(⟨↑0⟩);
                                      make(⟨↓1⟩); go(⟨↓1⟩);
                                      put(Ty(e→t)), Fo(BE),
                                      ?∃x.Fo(x)); ); go(⟨↑0⟩);
                              ELSE    IF      Tns(RECENT PAST)
                                      THEN    make(⟨↓0⟩); go(⟨↓0⟩);
                                              put(?Ty(e)), go(⟨↑0⟩);
                                              make(⟨↓1⟩); go(⟨↓1⟩);
                                              put(Ty(e→t)), Fo(W)
                                              ?∃x.Fo(x)); go(⟨↑0⟩)
                                      ELSE    abort
      ELSE    abort
```

As can be seen on examination of the lexical entry in (495) above, the trigger for parsing *-rɨ* is a ?Ty(t) node in all instances. The first IF clause introduces the requirement that there is no fixed structure present in the tree at the point at which *-rɨ* is parsed. This is represented by the bottom restriction which indicates that the ?Ty(t) node is the bottom most node. Such a condition can be met in both the general future tense and in the present tense use of *-rɨ*, since no fixed structure will have been introduced into the tree at the point at which *-rɨ* is parsed. In the case of the infinitive-auxiliary order in the general future tense, only the infinitive and the

subject marker on the auxiliary will have been parsed by the time the auxiliary *-rɨ* is parsed. In the alternation context, since the auxiliary is parsed before the verb, only the subject marker will have been parsed when *-rɨ* is encountered. The same is true for the present tense use of *-rɨ*, where only the subject marker will have been parsed before *-rɨ*.

The third use of *-rɨ* is captured by the IF clause which introduces the requirement for the annotation Tns(RECENT PAST) to be present in the tree. This parsing context is not restricted to instances in which there is no fixed structure present in the tree. Rather, the requirement for the annotation Tns(RECENT PAST) reflects the fact that in its recent past tense use, the past tense morpheme *áá-* is parsed before *-rɨ*. Since I analysed *áá-* as being responsible for the introduction of a fixed subject node and a fixed predicate node, fixed structure is necessarily present at the point in the derivation at which *-rɨ* is parsed (see section 5.4.1). Notably, in all its uses, *-rɨ* results in the projection of a fixed subject node and a fixed predicate node annotated with a metavariable placeholder. In the case of the future tense and recent past use, this metavariable is the general metavariable placeholder such as Fo(**W**). In the case of the present tense copulative use of *-rɨ*, this is the specific metavariable Fo(**BE**).

Returning to the modelling of the wh-expressions and the derivation currently under examination, parsing the auxiliary *-rɨ* results in the projection of a fixed subject node and a fixed predicate node. The introduction of this structure enables the tree node address of the previously unfixed node annotated with the information from the wh-element and the subject marker, to be fixed. This information is fixed as the logical subject of the clause. The auxiliary also introduces a metavariable annotation on the predicate node, as can be seen in the resulting tree shown in (496) below.

(496) Parsing: *ani arɨ...*

Tn(0), ?Ty(t), Cat(Q), Tns(GENERAL FUTURE), ◊

Ty(e),	Ty(e→t),
Fo(**WH**$_{\text{CLASS1}}$)	Fo(**W**), ?∃x.Fo(x)

The next element to be parsed is the infinitival verb form. In Chapter 5, I proposed that the infinitive is projected onto an unfixed predicate node following the application of the rule of PREDICATE ADJUNCTION. In the case of the auxiliary-infinitive order however, this is not possible since the rule of PREDICATE ADJUNCTION cannot apply in the presence of fixed structure. I propose therefore that in the presence of fixed structure (which in has been introduced by the auxiliary), the infinitive can project fixed predicate-argument structure. For monovalent predicates, this structure will be a Ty(e) subject node and a Ty(e→t) predicate node, both of which will collapse with the fixed structure which has already been introduced by the auxiliary. With transitive predicates this will also result in the construction of an object node and a Ty(e→(e→t)) predicate node.[77] However, this analysis requires an amendment to the lexical trigger for parsing the infinitival verb form, since it is not projected onto an unfixed node introduced by PREDICATE ADJUNCTION.

The analysis outlined in Chapter 5 saw the infinitive parsed in the presence of an unfixed predicate node. In order to capture the alternation contexts, I add a disjunction which also enables the parsing of the infinitive in the presence of fixed structure. Such a modifcation is dependent, however, on positing a complex lexical entry for the infinitive, which can capture the distinct processing conditions found in the alternation contexts and the infinitive-auxiliary order.[78]

Since the rule of PREDICATE ADJUNCTION cannot apply at the point at which the infinitive is parsed in auxiliary-infinitive structures, I propose a modification to the lexical entry for the infinitive. This allows the infinitive to be parsed in the presence of fixed structure but, only when such fixed structure is annotated with a predicate metavariable. This modified lexical entry for *rɨ́na* 'open' can be seen in (497) below.

[77] Similarly, for a ditranstive predicate which will also result in a Ty(e→(e→(e→t))) node and a corresponding Ty(e) object argument node.
[78] The challenge of parsing infinitives when they appear as the complements of verbs still remains.

(497) Lexical entry for the infinitivee *rɨna* (revised)

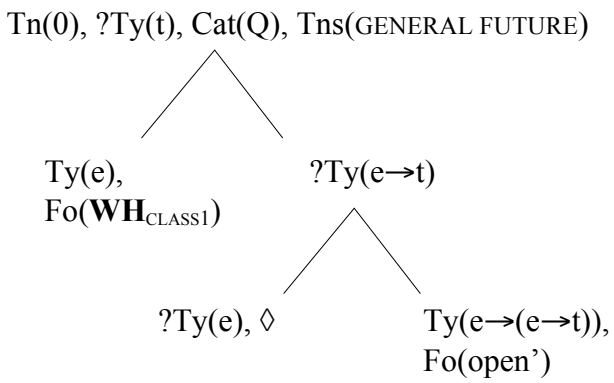
```
rɨna  IF      ?Ty(t)
      THEN    IF      ⟨↓*⟩?Ty(e→t)
              THEN    go(⟨↓*⟩); make(⟨↓0⟩); go(⟨↓0⟩); put(?Ty(e)); go(⟨↑0⟩);
                      make(⟨↓1⟩); go(⟨↓1⟩); put(Ty(e→(e→t)); Fo(rɨn’));
                      go(⟨↑1⟩); go(⟨↑*⟩)
              ELSE    IF      ⟨↓1⟩(Fo(V), Ty(e→t))
                      THEN    make(⟨↓0⟩); go(⟨↓0⟩); put(?Ty(e));
                              go(⟨↑0⟩); make(⟨↓1⟩); go(⟨↓1⟩); make(⟨↓0⟩);
                              go(⟨↓0⟩); put(?Ty(e)); go(⟨↑0⟩); make(⟨↓1⟩);
                              go(⟨↓1⟩); put(Fo(rɨn’), Ty(e→(e→t)));
                              go(⟨↑1⟩); go(⟨↑1)
      ELSE    abort
```

As can be seen on examination of the lexical entry for the transitive verb *rɨna* ‘open’ above, the lexical entry for infinitival verb forms is comprised of two sections. Whilst the lexical trigger for parsing the infinitive is a ?Ty(t) node, there is a disjunction, which captures the fact that the infinitive can be parsed either before or after the auxiliary. In the case of the infinitive-auxiliary order, a further restriction on parsing the infinitive is the requirement for an unfixed predicate node – indicated by the IF clause ⟨↓*⟩?Ty(e→t). When this condition is met, the lexical actions induced by parsing the infinitive result in the annotation of the unfixed predicate node and the construction of a subject node, an object argument node and a Ty(e→(e→t)) predicate node. Note however, that the predicate node remains unfixed with regards to the top node in the tree, although the unfixed predicate node dominates other fixed tree relations.

The second half of the lexical entry contains a restriction which allows the parsing of the infinitive only in the presence of a metavariable placeholder on a predicate node below the current node. When this condition is met, parsing the infinitive results in the annotation of this node with the semantic value of the predicate, as well as licensing the re-building of the subject node and the construction of the associated predicate node. As a transitive predicate, *rɨna* also licenses the construction of an

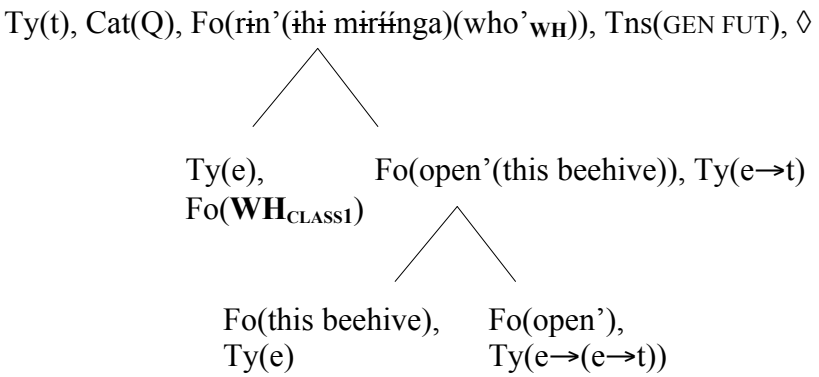
additional predicate node and an object argument node. The tree structure that results at this stage in the derivation can be seen in (498) below.

(498) Parsing: *ani a-r~~i~~ r~~í~~na...*



Parsing the object NP provides the full formula value interpretation for the ?Ty(e) object node. With all the information present and all the requirements satisfied, the final tree is shown in (499) below.

(499) Parsing: *ani ar~~i~~ r~~í~~na ~~i~~h~~i~~ m~~i~~r~~íí~~nga?*



I propose the same analysis for the immediate future tense auxiliary -*íise*, except with the auxiliary -*íise* being responsible for the introduction of an immediate future tense interpretation. In both the infinitive-auxiliary order and the alternation contexts, the lexical actions resulting from -*íise* induce the construction of a fixed subject node and a fixed predicate node annotated with a predicate metavariable. The difference in interpretation between -*íise* and -*r~~i~~* therefore relates only to the temporal information they encode. The way in which these temporal contributions

are established however, is the same in each instance, albeit with *-ri* resulting in a general future tense reading and *-íise* resulting in an immediate future tense interpretation.

The analysis I have presented is not yet sufficient to be able to capture the properties exhibited by the infinitive in all of its uses, which also include as a subject or object, and as the complement of a verb. The Bantu infinitive has long been observed to exhibit both verbal and nominal properties (Visser 1989; Creissels and Godard 2005). On the one hand it is often associated with a nominal prefix; can appear in subject and object NP positions; is associated with concordal agreement; and is available for modification – all properties typically associated with nominal elements. On the other hand, in many Bantu languages the infinitive can be inflected for tense, aspect and mood; can be negated or extended by the addition of verbal suffixes; may take an object or objectival concord and can be modified by adverbs and locatives – all of which are properties commonly associated with verbs (see section 2.5.2 for more on the properties of infinitives). This is also the case for Rangi where infinitives can be seen to function as an argument of the verb (500) as well as a verbal complement (501).

(500) kw-imb-a kw-ááchwe kwa-boh-a
INF-sing-FV 15-his/her 15.PRES-be.good-FV
'His/her singing is good'

(501) mb~~uu~~ j-áávo n~~í~~ k~~u~~-dom-a na i-saka noó saak-a
10.work 10-their COP INF-go-FV CONN 5-woods COP look.for-FV
h~~uu~~ki
9.honey
'Their work is to go to the woods to look for honey'

The analysis I have presented of the infinitive above is sufficient to account for the occurrence of the Rangi infinitive in auxiliary-infinitive and copula-based infinitival constructions (such as those shown in (500) and (501)). This is because the modification to the analysis that I have presented in the current chapter allows for the infinitive to be parsed in the presence of fixed structure. However, a bi-clausal analysis may be more suited to verb-infinitive constructions in order to account for

the establishment of propositional content by the verb as well as by the subsequent infinitive. However, the challenge of modelling the nominal use of the infinitive remains. In contexts in which the infinitive appears as a subject or an object, its type classification would be expected to be Ty(e) rather than Ty(e→t), as is found in its verbal use. In order to account for its nominal uses, an addition to the lexical entry would have to be made to allow the infinitive to be parsed as a Ty(e) term. In such instances however, it would be expected that the infinitive would be parsed on a LINK structure as has been seen in the case of Rangi full NP expressions. The challenge posed by the nomino-verbal properties of the infinitive in Bantu therefore carry over to the DS framework, where the type specifications are central to any analysis.

To summarise, I analyse Rangi wh-expressions which are parsed on the left periphery as being projected onto unfixed nodes. The analysis is based on standard assumptions made within the DS framework, according to which wh-elements and fronted constituents are projected onto unfixed nodes (Kempson et al. (2001); Cann et al. (2005b)). Furthermore, I analyse the wh-phrase as introducing the interrogative feature *Q* annotation at the root node and the decoration of the unfixed node with the specialised metavariable **WH**. In these constructions (and the other alternation contexts) the auxiliary is parsed before the infinitival verb form. I claim that the preverbal positioning of the auxiliary in wh-interrogative future constructions is motivated by the restriction on the co-occurrence of two unfixed nodes of the same modality at any point within a derivation and the distinct processing conditions associated with the infinitive-auxiliary and auxiliary-infinitive orders. Since wh-expressions also decorate unfixed nodes, the infinitive cannot be projected onto an unfixed predicate node because this would result in the co-existence of two unfixed nodes of the same modality. By definition, two unfixed nodes with the same modality are described identically in terms of tree node addresses. This means they are the same node (according to LOFT) and will therefore collapse. Reference to this restriction can therefore be used to account for the ungrammaticality of the infinitive-auxiliary order with a wh-construction. The auxiliary-infinitive order

which is encountered in wh-constructions can therefore be seen to follow from this standard restriction on tree growth mechanisms within DS.[79]

Whilst the lexical trigger for parsing the infinitive in the alternation contexts is different from those for the infinitive-auxiliary order, crucially, I argue that the lexical actions induced are the same, with the infinitive being responsible for the construction of fixed predicate-argument structure including the construction of a subject node. This reflects the fact that the semantic contribution made by the infinitive in both of these instances is similar and that, intuitively, the predicate-argument structure which it licenses should also be the same. The difference in lexical triggers reflects the differences in processing conditions associated with parsing the infinitive before and after the auxiliary. Moreover, these differences are, in turn, at least historically related to information packaging and information structure.

The dynamics of the interpretation process are therefore central to the understanding of Rangi auxiliary placement, since the positioning of the auxiliary is dependent on the processing mechanisms used. This is reflected in the complex lexical entries I propose for infinitive verb forms and the auxiliaries *-íise* and *-rɨ*. The lexical entry for the infinitives and the auxiliary comprise of two parts – one which characterises the preverbal placement of the auxiliary and one which characterises post-verbal placement of the auxiliary. Each of these comprises different triggers which reflect the different processing environments used for the constituents that are parsed earlier in the interpretation process. In all of the alternation contexts, preverbal auxiliary placement occurs in the presence of an unfixed node. I argue that it is not the grammatical nature of the constituent preceding the auxiliary that determines its placement, but rather the processing strategy used to build up the semantic content

[79] Bouzouita (2008b), Bouzouita and Chatzikyriakidis (2009), Kempson and Chatzikyriakidis (2009) and Chatzikyriakidis (2010)) all make similar claims in relation to clitic placement in Medieval Spanish, dialects of Modern Greek and Romance. They claim that clitic placement phonemena such as the Person Case Constraint stem directly from this restriction on tree growth.

of these left peripheral constituents. The analyses presented in the remaining sub-sections of this chapter will confirm the prediction that the other auxiliary-infinitive contexts also involve unfixed nodes.

I further propose that this analysis can be extended to all of the alternation contexts. This is based on the assumption that structural underspecification – captured formally by the presence of an unfixed node – is present in the processing of wh-interrogatives as well as in *sí...~~tukʉ~~* negation, relative clauses, cleft constructions and adverbial clauses. Section 6.3 shows this to be the case for the modelling of Rangi *sí…~~tukʉ~~* negation. Relative clauses, cleft constructions and subordinate clauses are discussed in subsequent sections.

6.3 Negation

Another context in which the auxiliary-infinitive order is found in future tense constructions is sentential negation. There are two negation strategies available in Rangi. The first employs the presence of a negative prefix on the verb stem which shows agreement in terms of person and number or noun class (see section 2.4.4). The second strategy involves the invariable negative marker *sí* and the negative polarity item *~~tukʉ~~*, with *sí* appearing in front of the verb phrase and *~~tukʉ~~* appearing after the verbal complex, as in examples (502) and (503) below.

(502)	sí	tú-r~~i~~	r~~i~~m-a	~~i~~-r~~i~~	i-y~~uu~~nda	t~~u~~k~~u~~
	NEG	SM1stpl-AUX	farm-FV	DEM-5	5-farm	NEG
	'We will not dig this farm'					

(503)	sí	nd~~i~~-r~~i~~	dom-a	na	Kondoa	t~~u~~k~~u~~
	NEG	SM1stsg-AUX	go-FV	CONN	Kondoa	NEG
	'I will not go to Kondoa'					

The only negation strategy found in the future tenses is the *sí…~~tukʉ~~* strategy. This construction exhibits the auxiliary-infinitive order, with the negative marker *sí* appearing before the auxiliary and *~~tukʉ~~* appearing after the infinitive.
I analyse Rangi future negative constructions as involving the projection of *sí* onto an unfixed node introduced by the rule of PREDICATE ADJUNCTION and the introduction of the negative feature, represented as the diacritic *Cat(Neg)* at the root

node. I further claim that, with the negative marker projected onto an unfixed node, the rule of PREDICATE ADJUNCTION cannot occur since these two unfixed nodes would be identified with the same tree node address and as such collapse onto each other. Rather, the auxiliary is parsed as the next element, introducing a fixed subject node and a fixed predicate node. The infinitive can subsequently be parsed, introducing another subject node and a predicate node, providing the annotation for the predicate node and introducing a requirement for the object node to receive interpretation in the case of transitive predicates. Parsing the negative marker *tʉkʉ* introduces a negative feature at the root node, although in the case of *sí…tʉkʉ* negation, this feature has already been introduced by the negative copula *sí*.

Following the analysis provided by Cann et al. (2005b) and Cann (2006; 2007) for the English copula *be*, I treat both the copula *nɨ* and the copula *sí* as projecting an underspecified predicate metavariable **BE**, which is the main predicate of the clause. As a Ty(e→t) predicate, the node decorated by **BE** has a Ty(e) argument. In a copula clause such as *I am tall*, the main predicate is decorated with the metavariable **BE** and the predicate *tall* provides the content for the metavariable. I claim that such an analysis can be adopted for Rangi for both the copula *nɨ́* and its negative counterpart *sí*. In the case of *sí*, the diacritic *Cat(Neg)* also annotates the root node, reflecting its negative interpretation.

Whilst a formal analysis of negation is pending in the Dynamic Syntax framework, Bouzouita (2008a; 2008b) uses the negative feature [+NEG] as a diacritic in her analyses of proclisis in negative environments in Medieval Spanish. The negative feature [+NEG] is assumed to be projected by the negation marker and introduced at the ?Ty(t) node. I propose that the introduction of a negative feature [+NEG] is not necessary to analyse the Rangi auxiliary-infinitive order, which I claim can instead by accounted for by reference to an unfixed node which is projected by *sí*. The unfixed node analysis fits with the proposal of an unfixed node as a generalised trigger, which has been presented so far for wh-elements and, as will be seen, allows

for the development of an unified analysis across all auxiliary-infinitive contexts. The stages of the derivation are discussed below.

I treat both the copula *nɨ* and the copula *sí* as being projected onto an unfixed predicate node introduced by the rule of PREDICATE ADJUNCTION. The copula projects an underspecified predicate metavariable **BE** onto the unfixed tree node, the address of which remains unspecified until a later stage in the derivation. Following the analyses of negative constructions as presented by Bouzouita (2008b) and Chatzikyriakidis (2010) for Medieval Spanish and Modern Greek respectively, I use a *pro tem* representation of negative polarity with the diacritic *Cat(Neg)* appearing at the root node. This information is not represented at any other location within the semantic tree since it does not have a bearing on the predicate-argument structure of the clause. The projection of a fixed subject node and a fixed predicate node annotated with a metavariable placeholder, and the introduction of the negative diacritic at the root node can be seen in the lexical entry for *sí* shown in (504) below.

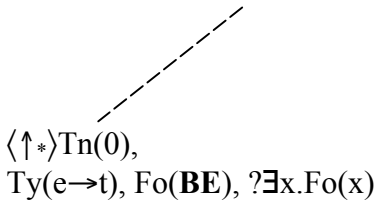
(504) Lexical entry for the negative copula *sí*

si	IF	?Ty(t), $\langle\downarrow_1^*\rangle$?Ty(e→t)
	THEN	put(Cat(Neg)); go($\langle\downarrow_*\rangle$); make($\langle\downarrow_1\rangle$); go($\langle\downarrow_1\rangle$);
		put(Ty(e→t), Fo(**BE**), ?∃x.Fo(x));
		go($\langle\uparrow\rangle$)
	ELSE	abort

As can be seen on examination of the lexical entry above, the copula *sí* has a ?Ty(t) node and an unfixed predicate node as its lexical trigger. This means that the copula *sí* is not responsible for the projection of the unfixed node, but merely provides the annotation for an unfixed node. I analyse this unfixed predicate node as having already been introduced via the computational rule of PREDICATE ADJUNCTION. In the presence of this unfixed ?Ty(e→t) node, *sí* introduces the diacritic *(Cat(Neg))* at the root node and leads to the annotation of the Ty(e→t) predicate node with the formula value Fo(**BE**) and the requirement that this metavariable receive full

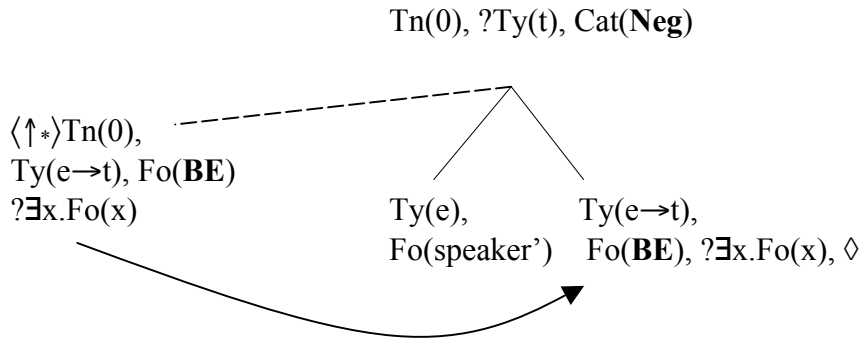
interpretation before the parse is complete (?∃x.Fo(x)). The partial tree that results from parsing *sí* can be seen in (505) below.

(505) Parsing: *sí...* Tn(0), ?Ty(t), Cat(Neg), ◊



Parsing the subject marker on the auxiliary results in the projection of a locally unfixed node annotated with a restricted metavariable. Parsing *-ri* induces the construction of a fixed subject node and a fixed predicate node (as was shown in Chapter 5). This provides a fixed tree node address for the subject expression and, via a MERGE operation, enables the introduction of the Fo(**BE**) metavariable at the fixed predicate node. The partial tree can be seen in (506) below.

(506) Parsing: *sí ndí-ri...*



In future tense constructions, the **BE** metavariable introduced by *sí* receives full update upon parsing the infinitival verb form. However, I maintain the metavariable analysis in order to be able to account for the use of *sí* as a standard copula where it connects a subject to an attribute or argument. This can be seen in examples (507) and (508) below.

(507) n~~ii~~n~~i~~ sí mw-aarimu t~~u~~k~~u~~
1st sg.PP NEG 1-teacher NEG
'I am not a teacher'

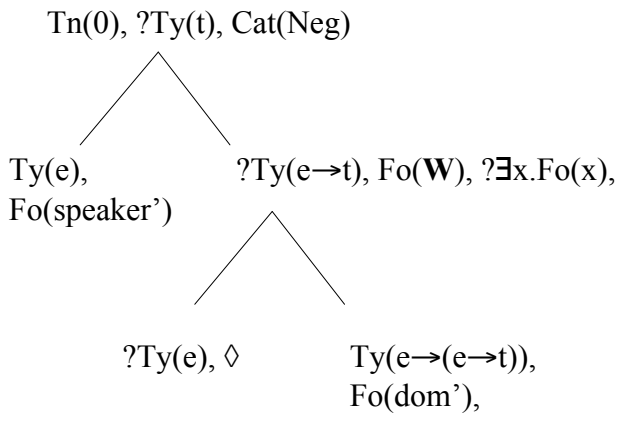
(508) weéwe sí m~~u~~-l~~ii~~h~~i~~ t~~u~~k~~u~~, n~~í~~ m~~u~~-kufi
2nd sg.PP NEG 1-be.tall NEG COP 1-short
'You are not tall, you are short'

I propose therefore that in instances in which the copula is followed by a verbal form (such as an infinitive in the future tense), the metavariable is substituted for a full formula value.[80] In instances where *sí* and *n~~i~~* are used as the sole predicative base of the clause however (as in (507) and (508) above), the information provided by the post-copula term is projected onto a LINK structure before providing a full formula value for the predicate node (see Cann (2005b; 2011) for discussion of this in English).

Parsing the infinitive after the auxiliary results in the projection of a fixed predicate node (or multiple fixed predicate nodes, in the case of transitive predicates) and the corresponding argument nodes as determined by the valency of the predicate. In the case of transitive use of *dom* 'go', this results in the construction of a Ty(e→(e→t)) predicate node and a Ty(e) object argument node to accommodate the location argument. This is in addition to the minimal predicate-argument structure already introduced by the auxiliary. The resulting tree can be seen in (509) below.

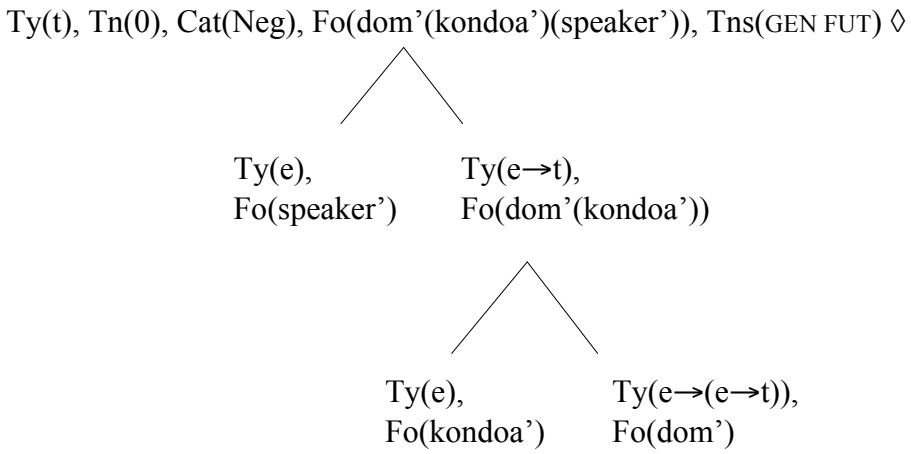
[80] The metavariable can also be replaced by a full formula value which is recovered from context given the right conditions.

(509) Parsing: *sí ndí-ri dom- ...*



The information made available by the prepositional phrase *na Kondoa* 'to Kondoa' provides fulfillment for the requirement on the ?Ty(e) object node.[81] I analyse the negative marker *tukú* as making no structural contribution to the parse but as responsible for introducing the negative feature into the clause. This is seen in the annotation *Cat(Neg)* at the root node.[82] With all of the requirements on the tree satisfied, a snapshot of the final stage of the derivation is shown in (510) below.

(510) Parsing: *sí ndíri dóma na Kondoa tukú*



[81] The internal structure of the phrase *na Kondoa* is not shown here. I assume however, that *na Kondoa* is of Ty(e), along the lines of the analysis adopted by Marten (2002).

[82] In the current derivation, the negative feature has already been introduced by the negative marker *sí*. In instances in which *tukú* is the sole marker of negation, however (see example (511)), it is necessary to analyse *tukú* as responsible for the introduction of this negative interpretation.

The analysis I have presented for sentential negation of future tense clauses is based on the claim that the negative marker *sí* is projected onto an unfixed node. This follows on from my proposal that the negative marker *sí* is related, at least historically, to the negative copula *sí*. This analysis also follows on from the observed synchronic and diachronic interaction between focus and negation, which has been noted cross-linguistically (see Sener and Issever (2003) for Turkish; Kenesei (2006) for Hungarian). Following the assumption made within the DS framework that unfixed nodes can be exploited to express focus effects, the unfixed node strategy for parsing the copula *sí* is well-motivated from a synchronic perspective. The unfixed node analysis correctly predicts that Rangi future tense negatives exhibit auxiliary-infinitive order. This is further supported by the analysis provided in section 6.2, under which an unfixed node is the trigger for the preverbal auxiliary placement in wh-interrogatives.

Further evidence in support of the unfixed node analysis of sentential negation in Rangi comes from the observation that negation involving the negative marker ~~*tukʉ*~~ alone does not result in the auxiliary-infinitive order, as can be seen in example (511) below.

(511) sínj-a tú-r~~ɨ~~ mb~~úrɨ~~ t~~ukʉ~~
slaughter-FV SM.1st pl-AUX 9.goat NEG
'We will not slaughter the goat'

Projecting the negative marker *sí* onto an unfixed node has the effect of prohibiting the introduction of another unfixed node until this unfixed node receives a fixed tree node address. In example (511) above however, the infinitive *sínja*[83] 'slaughter' can be projected onto an unfixed predicate node in the first instance since the unfixed node strategy has not been employed to parse a left-periphery element. Example (511) above also provides support for the idea that the auxiliary-infinitive order is triggered not by the negation interpretation of the clause, i.e. it is not triggered

[83] In this example the verb stem itself begins with *si-* and should not be confused with the negative marker *sí*. This example shows the infinitive-auxiliary despite its negative interpretation.

semantically, but as a result of the processing strategy used in the establishment of the semantic structure. This provides further evidence against assuming that a NEG feature constitutes part of the triggering environments for Rangi auxiliary-infinitive ordering.

Chatzikyriakidis (2010) avoids the use of a negative feature [+NEG] in modelling the proclisis that occurs with negation particles in Cypriot Greek. His alternative proposal is based on the observed interactions between negation and modality/tense-aspect in Cypriot Greek. Amongst the generalised triggers for proclisis, Chatzikyriakidis (2010) posits the requirement for a situation argument (?Ty(e_s)). He notes further that since modality and tense-aspect information is encoded inside the complex situation argument node, proclisis with negation can also be captured by reference to the ?Ty(e_s) trigger.[84] My adoption of an analysis of negation which does not include the negative feature [+NEG] is therefore further supported by the analysis provided by Chatzikyriakidis (2010), who also avoids employing an additional feature for characterising negation.

Bouzouita (2008:222 fn.1) also notes that in correspondence with Ruth Kempson, it was suggested that negation may project a term indicating 'no witness', and as such could also result in negation decorating an unfixed node. The unfixed node analysis of the copula *sí* therefore also falls into line with this comment, although under my analysis *sí* annotates an unfixed predicate node whilst 'no witness' would require a Ty(e) term. The potential for parallels in this regard however, provide an avenue for further research and may ultimately lead to a formal analysis of negation within Dynamic Syntax.

To summarise, I have modeled the type of sentential negation found in Rangi future tense constructions by analyzing *sí* as projecting an unfixed predicate node annotated with a metavariable placeholder Fo(**BE**). Parsing *sí* also introduces a

[84] Whilst I do not use the situation argument (e_s) in the analysis of negation, it is employed in section 6.6 in my analysis of adverbial clauses.

negative diacritic Cat(Neg) at the root node. Sentential negation in Rangi can therefore be seen to fit within the alternation contexts, with the presence of an unfixed node (either Ty(e) or Ty(e→t)) as the trigger for the auxiliary-infinitive order continuing to hold. The next section will show that the auxiliary-infinitive order found in relative clause constructions can also be attributed to the use of an unfixed node as part of the processing strategy.

6.4 Relative clauses

Relative clauses are analysed in DS as a conjunction of two trees in which the head noun and the relative clause are related via a LINK construction (Kempson et al. 2001; Cann et al. 2005b). In the case of relative clauses, the LINK structure is built from a Ty(e) node to a new ?Ty(t) node via the rule of LINK ADJUNCTION (for relatives). The version of the LINK ADJUNCTION rule used to model relative clauses as provided by Kula and Marten (2011) (based on Cann et al. (2005b:88)),s is shown in (512) below.

(512) The rule of LINK ADJUNCTION (for relatives)

$$\frac{\{\ldots\{Tn(a), Fo(\alpha), Ty(e), \Diamond\}\ldots\}}{\{n\ldots Fo(\alpha), Ty(e)\ldots\}, \{nL\ldots\ ?Ty(t), ?\langle\downarrow_*\rangle Fo(\alpha)\ldots\Diamond\ ,\}}$$

After the application of the rule of LINK ADJUNCTION (for relatives), the LINKed tree is further developed through information made available by the relative clause. Crucially, before the parse is complete, Fo(α) must be present somewhere in the LINKed tree to ensure the fulfillment of the requirement $?\langle\downarrow_*\rangle Fo(\alpha)$, which holds at the root node in the LINKed tree. This represents the introduction of a constraint into the tree that the LINKed structure contains a copy of the formula value of the head noun. This copy is often introduced through a pronominal element within the relative clause – typically a relative pronoun or a resumptive pronoun (see Kula and Marten (2011) for Bemba, Cann et al. (2005b) for English). After the relative clause has been parsed, the main tree is developed further with information provided by the matrix clause.

Relative clause constructions in Rangi also belong to the subset of syntactic environments in which the auxiliary-infinitive order is found in the future tense. Rangi relative clauses are formed through the use of the relative pronoun *-eene*, which shows agreement with the head noun in the relative clause. Rangi also exhibits relative clauses in which the relative pronoun *-eene* is not present in the clause. I assume that in contexts in which the relative pronoun is not present, the same lexical actions are induced by way of a process of pragmatic enrichment in the sense described by McCormack (2008), which argues for the pragmatic existence of constructive case in Bantu. This is also the case for English relative clauses which are formed without relative pronouns, e.g. *The food I most like to eat is stew* (see Cann et al. (2005b)). A relative clause construction which employs the relative pronoun *-eene* can be seen in example (513) below.

(513)	k~~u-u~~ntu	kw-eene	ndí-ri	dom-a	ní	k~~u-lii~~hi
	17-place	17-REL	SM1stsg-AUX	go-FV	COP	17-be.far
	'The place where I will go is far'					

Following on from DS analyses of relative clauses (Kempson et al. 2001; Cann et al. 2005b) and previous DS analyses of relative clauses in Bantu languages (Marten and Kula 2011), I model relative clauses in Rangi using two trees constructed in parallel and connected via a LINK relation. I claim that the LINK structure is introduced by the rule of LINK ADJUNCTION (for relatives) upon parsing the relative pronoun. I analyse the relative pronoun as responsible for the introduction of the requirement for a copy of the formula value of the head noun to be present in the main tree, as well as for the introduction of this copy. As such, the relative pronoun is responsible for establishing the LINK relation which ensures the flow of information between the matrix clause and the relative clause by virtue of the shared term. The stages of the derivation are outlined below.

Throughout this thesis I have analysed Rangi overt initial NP expressions as being projected onto LINK structures. Following this analysis, the NP expression *k~~uu~~ntu* 'place' is projected onto a LINKed tree built in parallel to the main tree. The rule of LINK ADJUNCTION (for topics) also introduces a requirement for a copy of the head

noun *k~~uu~~nt~~u~~* to be present in the main tree before the derivation is complete. This can be seen in (514) below.

(514) Parsing: *k~~uu~~nt~~u~~…*

$\langle L\rangle$Tn(0), Fo(k~~uu~~nt~~u~~'), Ty(e) $\longrightarrow$?Ty(t), ?$\langle\downarrow_*\rangle$Fo(k~~uu~~nt~~u~~'), $\Diamond$

I propose that parsing the relative pronoun *kweene* results in the launching of an additional LINK relation from the first LINKed tree. Parsing *kweene* also results in the introduction of a requirement for a copy of the head noun and the projection of an unfixed Ty(e) node annotated with this term – Fo(k~~uu~~nt~~u~~').[85] The tree which results from parsing the relative marker can be seen in (515) below.

(515) Parsing: *k~~uu~~nt~~u~~ kweene…*

$\langle L\rangle$Tn(0), Ty(e), Fo(k~~uu~~nt~~u~~') $\longrightarrow$ Tn(0), ?Ty(t), ?$\langle\downarrow_*\rangle$Fo(k~~uu~~nt~~u~~')

$\downarrow$

?Ty(t), ?$\langle\downarrow_*\rangle$Fo(k~~uu~~nt~~u~~'), $\Diamond$

$\langle\uparrow_0\rangle\langle\uparrow_1{}^*\rangle$Ty(t), Ty(e), Fo($\mathbf{U}_{\text{CLASS17}}$)

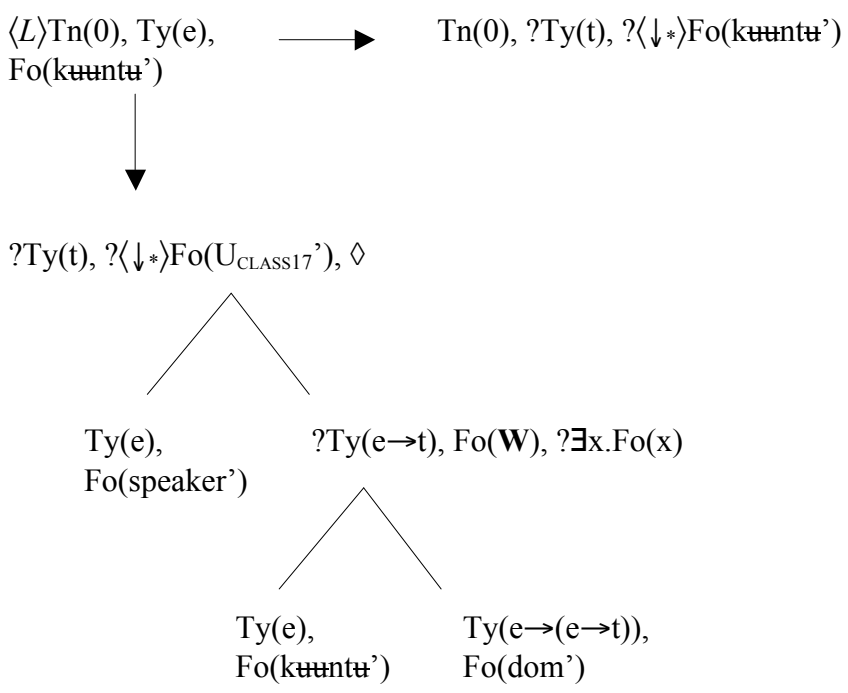
As can be seen on examination of the partial trees above, parsing the relativiser *kweene* results in the launch of a LINK structure from the first LINKed tree annotated with the information from the head noun to a new tree. Parsing the relative pronoun results in the introduction of the requirement that a copy of the head noun is found in

[85] Whilst the rule of ANTICIPATION is currently defined only to take place with daughter nodes, the analysis I propose here assumes that ANTICIPATION can also take place across a LINK structure. However, review of the technical details involved in this modification of ANTICIPATION is not attempted here, nor do I examine what the implications of such an amendment would be.

the parallel tree, as well as the projection of an unfixed node annotated with the requirement to receive update by a noun of the appropriate noun class – represented by the restriction Fo($\mathbf{U}_{\text{CLASS17}}$). On the basis that Rangi does not employ a resumptive pronoun strategy in relative clauses (see section 3.4.3), I also analyse the relative marker as responsible for the projection of an unfixed node and the provision of the copy of the head noun onto this unfixed node (see Kempson et al. (2011b) for a similar analysis of relative pronouns in SiSwati and English). In instances in which no relative pronoun is overtly present in the clause, I propose that the same lexical actions are induced through a process of pragmatic enrichment, as already noted above.

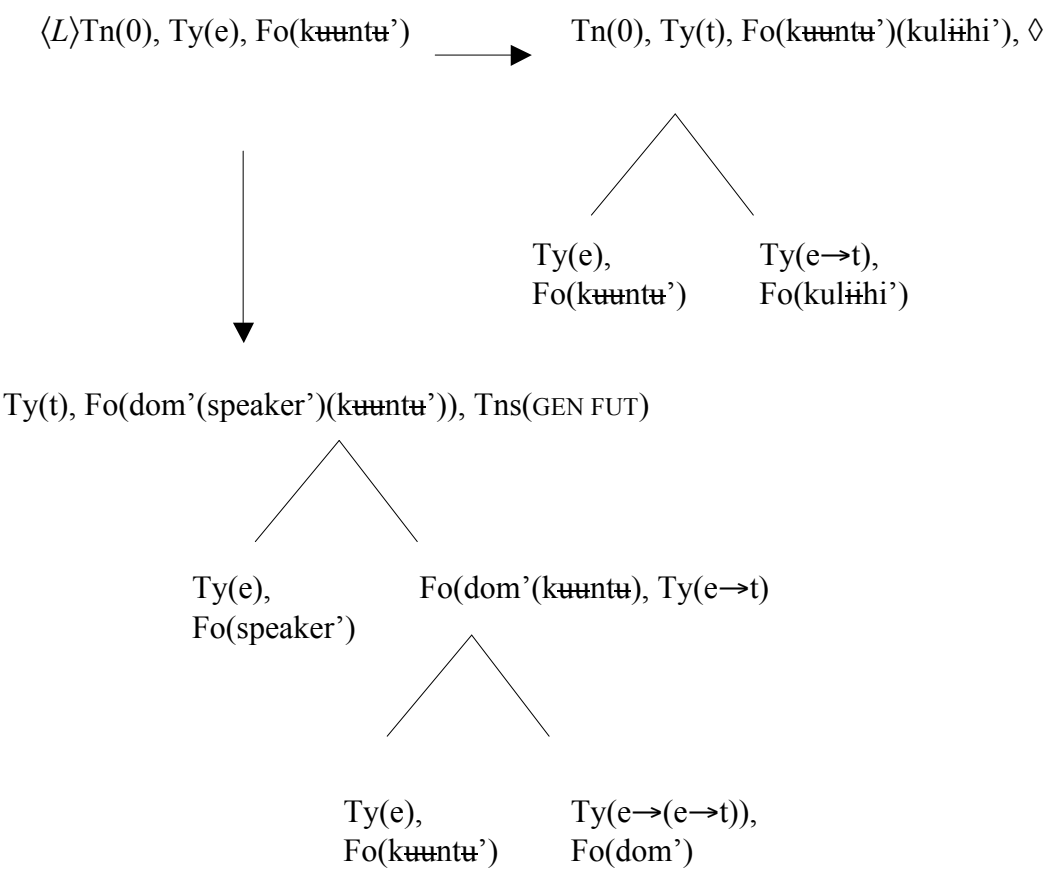
The derivation proceeds with the information from the matrix clause. Parsing the subject marker on the auxiliary results in the projection of a locally unfixed node annotated with the first person singular formula value which receives update to the full formula value Fo(speaker'). Parsing the auxiliary introduces a fixed subject node, which enables the establishment of a fixed tree node address and the fixing of Fo(speaker') as the logical subject. Parsing the auxiliary *-r~~ɨ~~* also introduces a fixed predicate node annotated with a predicate metavariable Fo(**U**), which does not receive full interpretation until the main verb is parsed. As a transitive predicate *dom* 'go' also builds a Ty(e→(e→t)) node, enabling the fixing of the argument term Fo(*k~~uu~~ntu*) – which has remained unfixed up until this point – as the object argument. The resulting tree can be seen in (516) below.

(516) Parsing: *k~~uu~~nt~~u~~ kweene nd~~í~~r~~i~~ doma…*



Finally, parsing the copula *n~~í~~* and the adjunct of the copula *kul~~ii~~hi* 'far' (which I assume annotates a ?Ty(e→t) node although I do not show the internal representation here), results in the decoration of the predicate node. Thus, the metavariable Fo(**BE**) is replaced with the full formula value Fo(kul~~ii~~hi'). This stage in the derivation can be seen in the final tree shown in (517) below.

(517) Parsing: *k~~uu~~nt~~u~~ kweene nd~~í~~r~~i~~ doma n~~í~~ kul~~ii~~hi*



With the information compiled up the tree, the derivation is complete. With two trees constructed in parallel and all of the requirements fulfilled, the flow of information between the trees is ensured by the presence of the shared item *k~~uu~~nt~~u~~* in both trees and the LINK structures which connect them.

Such an analysis is supported by the absence of a resumptive pronoun or an object marker (see section 3.4.3), meaning that the burden of these lexical actions is carried by the relative pronoun. I propose that the analysis presented here is appropriate to account for the data available. For a conclusive analysis however, a more comprehensive empirical base would be needed, including examples of different relative clause constructions, involving different noun classes, definite and non-definite nouns, demonstratives and the extraction of different argument types.

The utterance in example (513) is a non-restrictive relative clause, meaning that the relative clause contributes only additional information about the nature of the noun. Kula and Marten (2011) capture the distinction between restrictive and non-restrictive relative clauses in Bemba by reference to the availability of two potential launch points from which the LINK relation can be launched. They claim that in the case of restrictive relative clauses, the LINK relation may be launched at the stage at which the nominal variable is introduced so that the LINK relation restricts the variable – hence the restricted reading. Alternatively, launching a LINK relation after the semantic representation of the head noun is already complete, meaning that the LINK relation is launched from the Ty(e) node which represents the completed information from the head noun, results in a non-restrictive reading. Whilst the data from Rangi are not sufficient to be able to test such a proposal for capturing the non-restrictive/restrictive reading, being able to model this distinction by reference to tools already proposed for the Rangi analysis is a distinct advantage to the analysis outlined here. A closer examination of non-restrictive/restrictive relative clauses in Rangi, and their interaction with interpreting meaning from context, would be a possible direction for future research.

To summarise, I propose that the auxiliary-infinitive order with which future tense relative clauses are associated, derives from the presence of an unfixed node as part of the processing strategy. The analysis I have provided for Rangi relative clauses is one under which relative clauses are represented as two trees constructed in parallel and connected via a shared term which is indicated by a LINK structure. The relative pronoun -*eene*, in conjunction with the agreeing prefix, provides both the requirement for a copy of the formula value of the head noun as well as the copy itself, which is projected onto an unfixed node.[86] With the copy of the head noun projected onto an unfixed node following the parsing of the relative pronoun -*eene*,

[86] The induction of the same actions (introduction of a requirement for a copy of the head noun and the projection of this copy onto an unfixed node) in instances in which there is no relative pronoun present, is further supported by the analysis of empty relatives in English put forward by Cann et al. (2005b).

the auxiliary-infinitive order is triggered.[87] An unfixed node is therefore present in the tree at the point at which the inflected auxiliary is parsed, resulting in the introduction of the future tense interpretation. The tree node address of the copy of the head noun remains underspecified until the auxiliary is parsed and fixed predicate-argument structure is introduced into the main tree, enabling update to a fixed tree address. With the auxiliary introducing a fixed subject and predicate node, the infinitive introduces a full formula value for the predicate node in the presence of the future tense interpretation. After completion of the relative clause, the main tree is developed with information from the matrix clause and any outstanding requirements satisfied. In this way, the generalisation that the auxiliary-infinitive order has the presence of an unfixed node as its trigger holds for wh-interrogatives, clauses involving *sí…~~tukʉ~~* negation and, as shown in this sub-section, relative clauses.

Cross-linguistically, cleft constructions have been shown to exhibit a number of parallels with relative clauses. That cleft constructions in Rangi also exhibit auxiliary-infinitive order is therefore not surprising. The central question therefore, is to what extent they can be modelled by reference to similar processing strategies as were used for relative clauses. Section 6.5 below shows that the presence of an unfixed node as a generalized trigger for the auxiliary-infinitive order also holds for cleft constructions.

6.5 Cleft constructions

Although there are a number of different uses of clefts, cross-linguistically clefts exhibit a number of parallels with relative clauses. One characteristic of this parallel in Rangi is seen in the auxiliary-infinitive order in the future tense, which is associated with both cleft constructions and relative clauses (as was shown in section 6.4). Cleft structures in Rangi are typically formed using the copula *ní,* which is positioned in front of the verbal complex (or a prepositional phrase) and the fronted

[87] A detailed analysis of the internal structure of the relative pronoun is beyond the remit of the current study since it would require a in-depth analysis of the internal structure of nouns, as well as an examination nominal roots and their interaction with subject markers. This would also entail a significant deviation from the issues currently under discussion.

subject NP expression, marking this as the 'clefted' element. This strategy can be seen in example (518) below.

(518) n~~í~~ n~~íí~~n~~í~~ nd~~í~~-r~~í~~ kán-y-a ~~ú~~-h~~ú~~ m~~ú~~-t~~í~~
COP 1st.sg.PP SM1stsg-AUX fall-CAUS-FV DEM-3 3-tree
'It is me, I will fell this tree'

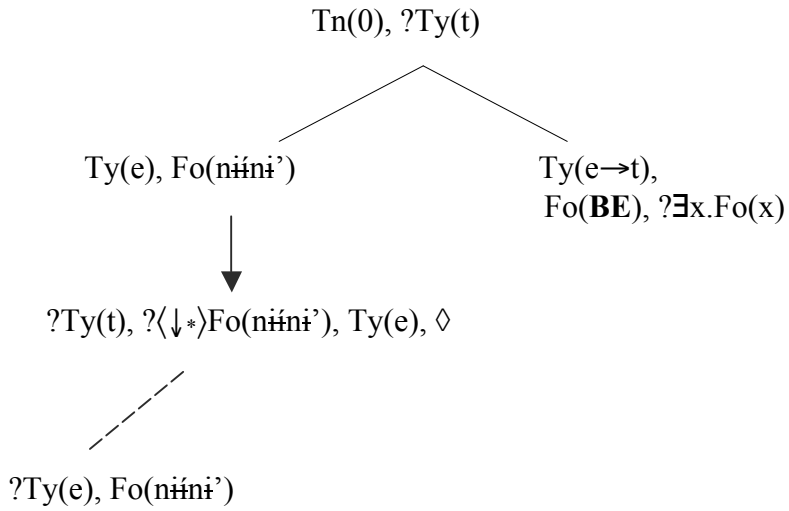
The Dynamic Syntax framework makes available two possibilities for parsing cleft constructions. As focus constructions, the left-dislocated elements in cleft constructions can be modelled, like wh-expressions, as decorating unfixed nodes (Kempson et al. 2001:150-189; Cann et al. 2005b:153-154). The observation that certain types of cleft structures involve a presentational or backgrounding effect however, means that they can also be represented through the construction of a pair of LINKed trees (Kempson et al. 2011b). Under a LINK structure analysis, the 'clefted' element decorates a Ty(e) node connected to the main tree by a LINK relation (see Kempson et al. (2011) for the availability of this strategy in SiSwati). This strategy also reflects the observed cross-linguistic parallels between cleft constructions and relative clauses which are also modelled in DS using LINK structures, and which I have modelled in Rangi as involving a LINK structure.

Following on from previous analyses of cleft structures within Dynamic Syntax, and the observed parallels between cleft structures and relative clauses, I propose an analysis of Rangi cleft structures under which the left-dislocated element is related to the main tree via a LINK structure. The presence of the LINK structure reflects the pragmatic impact of clefting the NP expression and the contrastive focus interpretation that ensues. I propose that parsing the copula *n~~í~~* at the left periphery and the obligatory NP expression which follows it, results in the establishment of basic skeletal predicate-argument structure and the launching of a LINK relation from the ?Ty(e) node. This transition, to a type-t-requiring node in a parallel tree, also imposes the requirement for a term to be shared by the LINKed tree and the main tree once it has been constructed. In this way, the LINK relation ensures the flow of

information between the two trees which is achieved via a shared term, as was also seen for relative clauses.

I propose that parsing the copula *nɨ́* results in the projection of a fixed subject node and a fixed predicate node annotated with the formula value Fo(**BE**) (see section 5.4.2 and 6.3 for similar analyses of *-rɨ* and *sí* respectively). Parsing the overt NP expression *nɨ́ɨ́nɨ* provides the annotation for the subject node. At this stage in the derivation, I propose that the LINK ADJUNCTION rule applies, resulting in the launch of a LINK structure from the Ty(e) subject node to a new ?Ty(t) node. I further claim that an unfixed node is projected from this new ?Ty(t) node and annotated with the requirement for a copy of the information from the NP expression to be found in the parallel tree. I also propose that parsing the 'clefted' element provides the copy of this noun, which is projected onto an unfixed node as can be seen in (519) below.

(519) Parsing: *nɨ́ nɨ́ɨ́nɨ...*

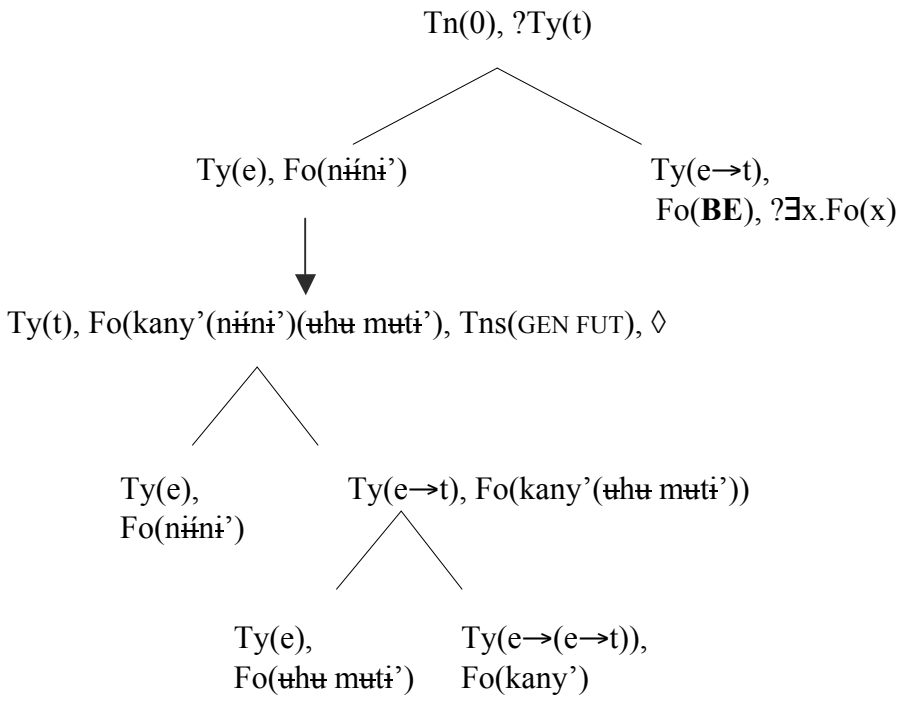


As can be seen upon examination of the tree above, the LINK transition rule is launched from the Ty(e) node. I claim that it is at this point that a requirement for a copy of the formula value of the head noun, this copy itself and an unfixed node are introduced into the parse. Since there is no morphological input at this point in the derivation, the analysis I adopt is based on the application of computational rules which are responsible for inducing these three actions. In relative clauses without

relative pronouns, the proposal of these computational actions is well-motivated by analogy with relative clauses which contain relative pronouns. I propose that the same analysis can also be adopted for cleft constructions, again, on the basis of similarities between cleft constructions and relative clauses and pragmatic enrichment.

Parsing the auxiliary provides the basis for the emergent fixed structure. The subject marker on the auxiliary projects a locally unfixed node annotated with a restricted metavariable, as I have claimed to be the case throughout the analysis of Rangi subject markers. The metavariable introduced by the subject marker receives interpretation against the background of the NP expression which annotates the unfixed node. Parsing the auxiliary introduces a fixed subject node, which enables the fixing of the NP expression as the logical subject. Parsing the auxiliary also introduces a fixed predicate node annotated with a metavariable. This metavariable receives interpretation when the infinitival verb form *kanya* 'fell' is parsed. In the presence of an unfixed node, I also analyse the auxiliary as introducing a future tense interpretation – general future for *-rɨ* and immediate future for *-ílse*. Parsing the infinitive induces the construction of another fixed subject node and a fixed predicate node. These nodes collapse with the fixed minimal structure which has already been introduced by the auxiliary. The parsing of a transitive predicate however, licenses the construction of further predicate-argument structure. This can be seen in the case of *kanya* 'fell' which licenses the construction of a Ty(e→(e→t)) node. The resulting tree can be seen in (520) below.

(520) Parsing: *nɨ́ niɨ́nɨ ndɨ́rɨ kanya ʉhʉ mʉti*



There is no specific morphology employed in the construction of cleft structures in Rangi. The ability of the LINK ADJUNCTION rule to apply at the appropriate point in the derivation is therefore dependent on the correct input for the computational rule to apply. In the derivation outlined above, the application of the LINK ADJUNCTION rule results in the launch of a LINK structure from a Ty(e) node to a new ?Ty(t) node.

One drawback of the analysis outlined above, and for the analysis proposed for relative clauses which do not contain relative pronouns, is that a significant amount of propositional structure is induced through computational rules alone. In the case of the cleft construction, this means that the LINK structure, the requirement for the copy of the formula value of the head noun and the projection of this copy are all the result of computational rules and do not result from actions induced by lexical elements. However, one advantage of the proposed analysis is that it is able to capture the observed parallels between the relative clauses and the cleft structures, as well as maintaining the unfixed node as part of the processing strategy for cleft

constructions. In doing so, the proposed analysis maintains a uniformity within the analysis of the alternation contexts.

The proposal that wh-constructions, relative clauses and cleft constructions are modelled using unfixed nodes and LINK structures, reflects the parallels between these construction types. The idea that these constructions interact with information structure and share a number of properties is not new and is not confined to Dynamic Syntax. These parallels have been noted in the Government and Binding (GB) and the Minimalist traditions, where it has been claimed that wh-movement and focus movement for example, target the same position in a number of languages (see, among others, Horvath (1968) and Kenesei (2006) for Hungarian; Rizzi (1997) for Italian; Ouhalla (1997) for Standard Arabic; Dobrovie-Sorin (1994) for Romanian). My analysis of Rangi wh-constructions, relative clause and cleft constructions involving unfixed nodes and LINK structures therefore follows from the observed similarities between these constructions. However, the left-to-right incrementality, structural underspecification and information update which are at the heart of the current analysis have previously received only limited attention. It is these elements which are brought out naturally by the tools of the DS analysis.

To summarise, I claim that the presence of the copula *nɨ* clause-initially results in the projection of a fixed subject node and a fixed predicate node. Parsing the NP expression which occurs obligatorily in cleft constructions, results in the decoration of the subject node, the launch of a LINK structure from the Ty(e) node, the introduction of a requirement for a copy of the noun to be found in the LINKed tree and the subsequent projection of an unfixed node annotated with a copy of the information provided by the noun. The derivation then proceeds with the information made available from parsing the matrix clause. Since the auxiliary-infinitive order follows the cleft construction, this sees the parsing of the subject marker, which results in the projection of a locally unfixed node and the establishment of a fixed subject node and a fixed predicate node when the auxiliary is parsed. Parsing the auxiliary also introduces a future tense interpretation into the

tree represented by the diacritic Tns(FUTURE) at the root node. The proximity of the future – immediate future or general future – is also determined by the auxiliary. Parsing the infinitive results in the construction of a fixed subject node and a fixed predicate node. These nodes collapse with those introduced by the auxiliary. The infinitive may also contribute further predicate-argument structure depending on the valency of the predicate in question.

I claim that the use of the unfixed node as a processing strategy can be used to account for the auxiliary-infinitive order which is found in cleft constructions. This unfixed node analysis further maintains the generalisation that the presence of an unfixed node acts as a trigger for the auxiliary-infinitive order, adding to the unfixed node analyses of wh-interrogatives, *sí…~~tɨkɨ~~* negation and relative clauses. The parallels between these construction types are represented through being associated with the auxiliary-infinitive order as well as the processing strategies which they induce – unfixed node and LINK structure – both of which reflect structural underspecification and the central role played by context in the interpretation of these construction types.

Section 6.6 below examines Rangi subordinate clauses, providing a formal modelling of these constructions. It shows that unfixed nodes are also part of the processing strategy used in clauses introduced by the subordinators *jool~~ɨ~~* and *kooni,* which also exhibit auxiliary-infinitive order in the future tense.

6.6 Subordinate clauses

Future tense clauses introduced by the subordinators *kooni* 'if' and *jool~~ɨ~~* 'how' also exhibit auxiliary-infinitive order and, as such, form part of the alternation contexts currently under examination.[88] The preverbal placement of the auxiliary in these constructions can be seen in examples (521) and (522) below.

[88] The subordinator *vyeene* 'the way in which' also triggers the auxiliary-infinitive order. It is not discussed here, however, since I consider it to be a combination of the class 8 adverbial prefix *vy-* and the relative pronoun *-eene.* As such, I assume that the analysis I have proposed for modelling relative clauses can be extended to clauses introduced by *vyeene*.

(521) k~~u~~-~~ú~~j-a á-r~~ɨ~~ koóni á-r~~ɨ~~ rét-a chá-k~~u~~rya
INF-come-FV SM1-AUX if SM1-AUX bring-FV 7-food
'S/he will come if s/he brings food'

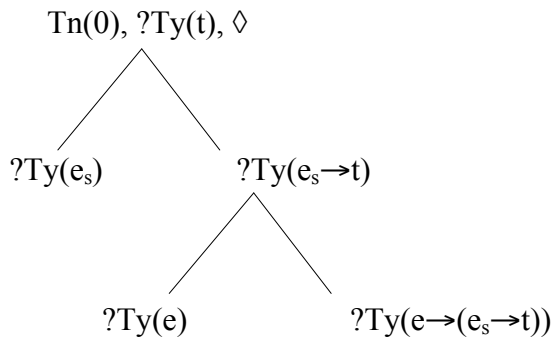
(522) n-íyó-wás-a jool~~ɨ~~ nd~~ɨ́~~-r~~ɨ~~ pát-a chá-k~~u~~rya
SM1st sg-PROG-think-FV how SM1st sg-AUX get-FV 7-food
'I am thinking about how I will get food'

As can be seen in the examples above, the future constructions which follow the subordinators *kooni* and *jool~~ɨ~~* exhibit the auxiliary-infinitive order. On the basis of the analyses presented for the auxiliary-infinitive order thus far, it can be predicted that these clauses also involve an unfixed node as part of their processing strategy. This is indeed the analysis I pursue, although I argue that in order to successfully capture the auxiliary-infinitive order associated with subordinate clauses, the tools of the framework employed in the thesis thus far must be extended, to include the notion of the situation argument as proposed by Gregoromichelaki (2006). I claim that employing an unfixed situation argument can be used to account for the auxiliary-infinitive order associated with subordinate clauses introduced by *jool~~ɨ~~* and *kooni*.

Gregoromichelaki (2006) proposes the addition of an argument for propositional representation that expresses the situation of evaluation – the situation argument node. The situation argument of a predicate is explicitly represented on the tree and is the locus where tense and aspect properties are encoded. Following Gregoromichelaki (1986; 2006) and Cann (2011), the situation argument is assumed to be of the general type *e,* but further specified as e_s where *s* represents situation.[89] The basic structure of a semantic tree, including the situation argument can be seen in (523) below.

[89] Under this approach the general type *e* can also have the subtypes e_i, where *i* stands for individuals, and e_w where *w* stands for worlds (Chatzikyriakidis 2011).

(523) Tree structure including situational argument



The relationship between two clauses which are connected by an if-expression is one of conditionality, with the event encoded by one clause dependent upon the event encoded by the other clause.[90] To characterise this dependency and the flow of information that passes between the clauses, I claim that they can be analysed as being connected via a LINK relation, with a shared Ty(e_s) situation argument term present in each tree. Given that the analyses for the auxiliary-infinitive constructions I have presented thus far all involve an unfixed node, I propose that this situation argument node is unfixed when it is first introduced into the parse. The underspecified nature of the tree node address of the event term further reflects that its eventual position within the tree is not known at this early stage, nor is the precise nature of the dependency relationship between the two events. I therefore claim, that this unfixed node is responsible for triggering the auxiliary-infinitive order with which the *kooni*-clauses are associated. This also means that Rangi clauses introduced by *kooni* can be added to the contexts in which the auxiliary-infinitive order is triggered by the presence of an unfixed node.

My proposal of an unfixed situation argument node follows on from the proposal of situation arguments by Gregoromichelaki (2006), amongst others, as well as the availability of unfixed nodes of other types which are made standardly available in DS. I extend the unfixed node analysis to the notion of an unfixed situation node

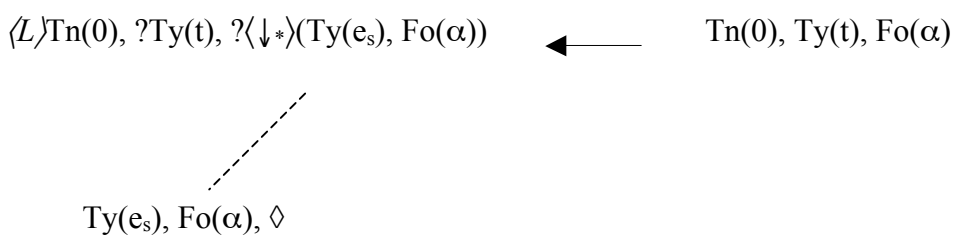
[90] Whilst I do not wish to pursue a detailed analysis of if-clauses, the reader is referred to Gregoromichelaki (2006) for an in-depth discussion of conditionals and the presentation of a DS analysis of conditional clauses.

which, in the case of subordinate clause, I use to represent the logical relationship between the two clauses. This relationship is characterised by one clause presupposing that the other clause (and the associated event) has taken place or will take place. Whilst in a relative clause I represented this dependence through a shared Ty(e) term, I claim that with an if-clause, the dependence can be represented through a shared Ty(e_s) event term.

I propose a possible analysis of Rangi clauses introduced by *kooni* which is developed out of the analysis provided for relative clauses and cleft constructions. As such, I propose the launch of a LINK structure, the introduction of a requirement for a copy of the event argument term, as well as the provision of this copy which is projected onto an unfixed node. Such an analysis is also in line with the analysis proposed by Gregoromichelaki (2006), under which the relationship between the antecedent clause and the consequent clause in conditional clauses is modelled by reference to a LINK relation.

I propose that parsing *kooni* 'if' results in the projection of a LINK structure from the event argument which is encoded in the first part of the clause. This parallel LINKed tree is then annotated with a requirement that a copy of the event is found somewhere within the eventual tree (as was also seen for relative clauses and cleft constructions, although these involved the sharing of an argument term). I further claim that parsing *kooni* 'if' provides the copy of this event term which is projected onto an unfixed node. It is the presence of this unfixed node which triggers the auxiliary-infinitive order in a *kooni*-clause. The lexical item *kooni* must also encode the restriction that the copy of the term is an event term, accurately reflecting that *kooni* connects two event arguments. A sketch tree outlining this relationship is shown in (524) below.

(524) Introduction of an unfixed event variable



As can be seen upon examination of the sketch tree above, a LINK relation is launched from the initial ?Ty(t) node to another ?Ty(t) node. The root node of the new tree is annotated with the requirement that a copy of the situation argument be found somewhere in the tree before the parse is complete. I propose that parsing *kooni* is also responsible for the introduction of this copy of the event variable term which is projected onto an unfixed node. Whilst I do not provide a thorough analysis of the semantics of conditional clauses within DS (the reader is referred to Gregoromichelaki (2006)), the sketch of the tree relations outlined above and the issues presented here are sufficient to support the prediction that the presence of an unfixed node is involved in the parsing of the clauses introduced by *koonɨ*. The presence of an unfixed node as a generalised trigger for the auxiliary-infinitive order can therefore be maintained.

Parsing the auxiliary that follows the clefted element results in the introduction of a fixed subject node and a fixed predicate node. Parsing the infinitival verb results in the projection of a fixed subject node and a fixed predicate node, both of which collapse with the fixed structure introduced by the auxiliary. If the verb is transitive it will also result in the construction of an additional predicate node and an object argument node.

The analysis I provide for subordinate clauses introduced by *koonɨ* follows on from the observations made by Gregoromichelaki (2006) and Bouzouita (2011) in relation to if-clauses in English and Greek, and Medieval Spanish respectively. In her analysis of complement clauses, Bouzouita (2008b) considers the subordinator *si* 'if'

in Medieval Spanish to annotate a fixed type-t-requiring node from which the subsequent clauses are built with a tense requirement (Bouzouita 2008b:281–83). This requirement is satisfied once the finite verb has been parsed, thereby annotating the ?Ty(t) node with the appropriate tense specification. I analyse Rangi if-clauses by reference to a LINK structure which is projected upon parsing the subordinator *kooni* 'if'. Parsing *kooni* is also responsible for the introduction of a requirement for a copy of the event term to be present in the LINKed tree, as well as the projection of an unfixed situation argument node annotated with a copy of the information provided by the situation argument of the antecedent phrase. In this way, the relationship between the antecedent phrase and the consequent phrase is reflected by the flow of information through the LINK structure and the sharing of the situation argument term.

I propose that parsing the subordinator *jool~~ɨ~~* 'how' also results in the projection of an unfixed node. With *jool~~ɨ~~* however, the relationship between the two clauses is not characterised by a conditional dependency as was seen with *kooni* 'if'. Rather, *jool~~ɨ~~* is used to introduce a manner clause which describes the way in which the event argument is carried out. However, I build on an analogy with *kooni*, since both subordinators function to connect two clauses and result in the auxiliary-infinitive order. I propose however, that *jool~~ɨ~~* projects an unfixed situation argument node – an analysis which is possible since *jool~~ɨ~~* appears alongside verbs which subcategorise for clausal complements. This contrasts with the analysis I proposed for *kooni*, which involved a LINK construction.

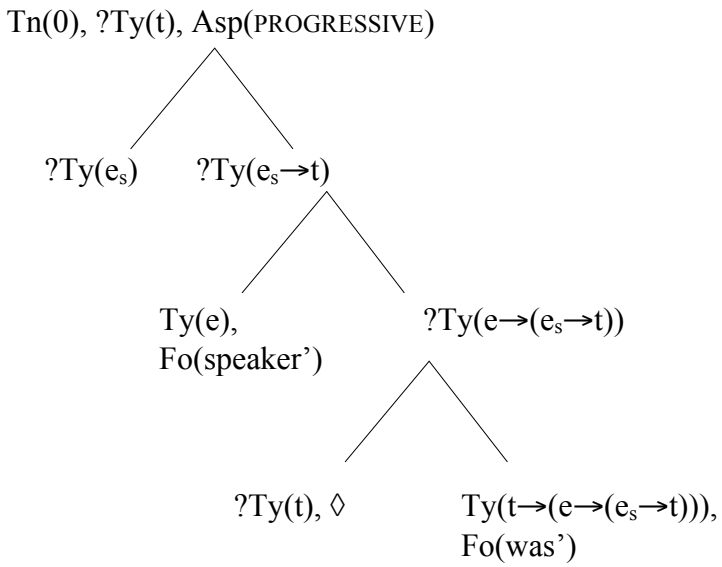
I claim that the matrix clause leads to the establishment of a partial semantic tree following the standard rules I provided for Rangi clause structure in Chapter 4. The stages of the derivation for parsing the utterance in (525) (repeated from (522) above), are presented below.

(525)	n-íyó-wás-a	jool~~ɨ~~	nd~~í~~-r~~ɨ~~	pát-a	chá-k~~u~~rya
	SM1st sg-PROG-think-FV	how	SM1st sg-AUX	get-FV	7-food

'I am thinking about how I will get food'

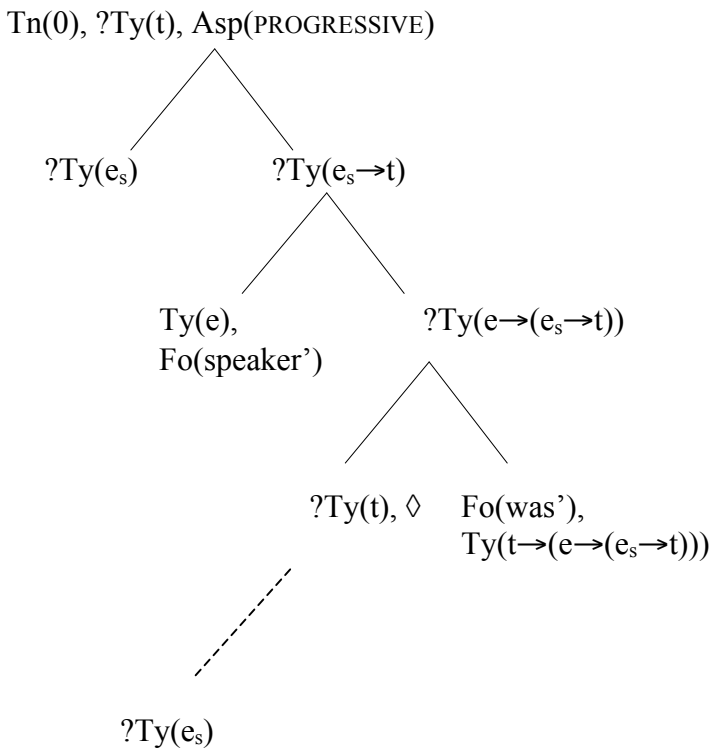
Parsing a verb phrase such as *níyówása* 'I wonder' results in the projection of a locally unfixed node annotated with the information provided by the subject marker. This locally unfixed node receives a fixed tree node address upon parsing the progressive marker *íyó-*, which projects a fixed subject node and a fixed predicate node. Parsing *íyó-* also introduces a present tense and progressive aspect interpretation. Parsing the verb stem results in the projection of a fixed subject node and a fixed predicate node, as well as the construction of a fixed Ty(t→(e→(e_s→t))) predicate node and its corresponding argument node. Since -*wasa* 'wonder' subcategorises for a Ty(t) argument, in the derivation under discussion this will be a Ty(t) argument node. I also assume the projection of a Ty(e_s) situation argument node, as discussed above. These assumptions can be seen in the partial tree in (526) below.

(526) Parsing: *n~~í~~yówása* ...



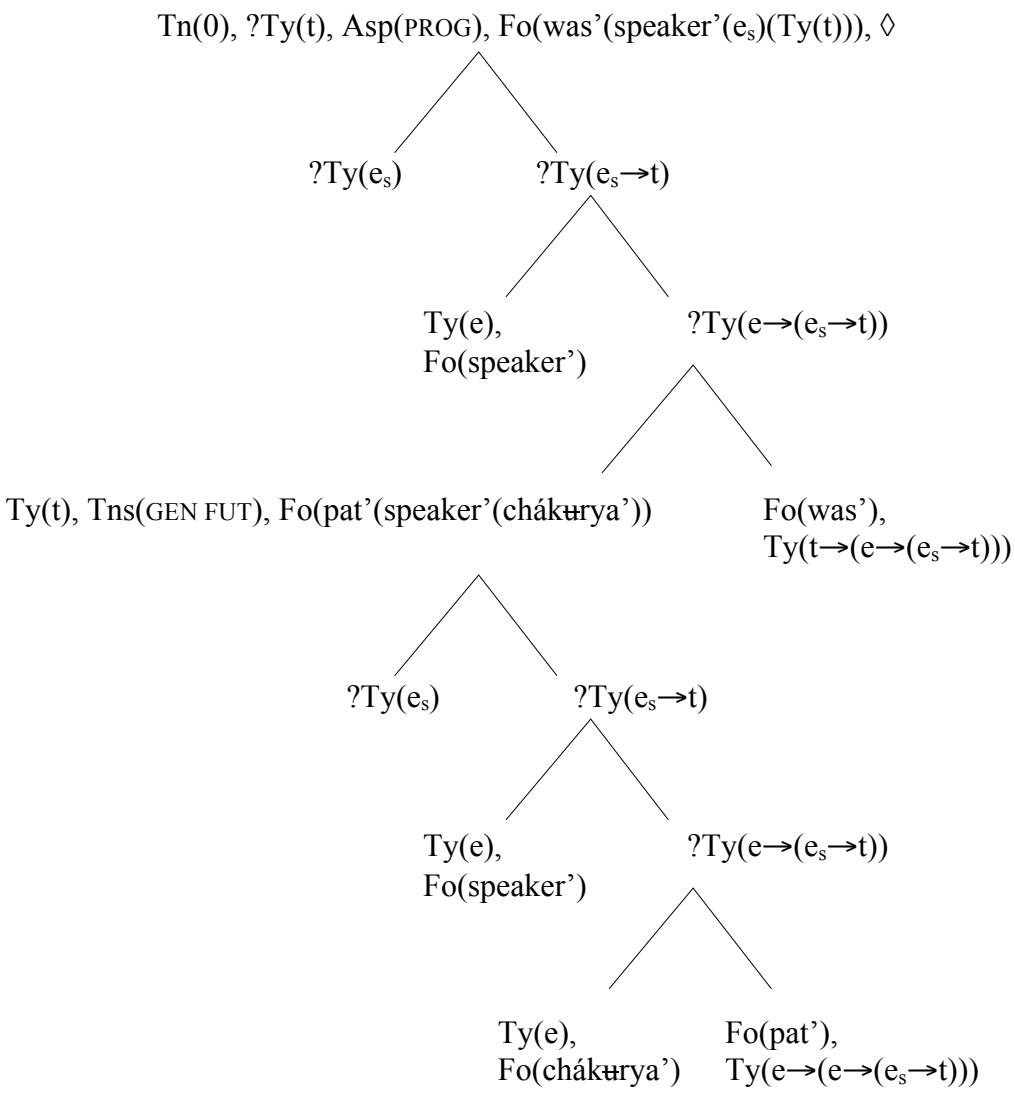
With the ?Ty(t) node introduced by parsing the -*wasa* verb stem, I propose that parsing the subordinator *jool~~i~~* results in the projection of an unfixed situation argument node from the ?Ty(t) node. This results in the tree structure shown in (527) below.

(527) Parsing: *níyówása jooli...*



Parsing the subordinate clause subsequently results in the establishment of propositional structure following the standard computational and lexical rules that I assume are available for Rangi. Under the analysis which includes the event variable, parsing the auxiliary results in the projection of fixed Ty(e_s), Ty(e_s→t), Ty(e) and Ty(e→(e_s→t)) nodes. The provision of a fixed Ty(e_s) node enables the fixing of the unfixed Ty(e_s) node. Parsing the infinitival verb form results in the construction of the same fixed structure, as well as the construction of another Ty(e) node and a Ty(e→(e→(e_s→t))) node. This can be seen in the tree shown in (528) below.

(528) Parsing: *n~~ɨ~~yówása jool~~ɨ~~ nd~~ɨ~~r~~ɨ~~ páta chák~~u~~rya*



As can be seen on examination of the tree above, I do not model clauses introduced by *jool~~ɨ~~* using a LINK structure. Rather, I consider the flow of information between the main clause and the subordinate clause to be the result of the verb in the matrix clause – in this case -*was* 'wonder' – which subcategorises for a Ty(t) complement. The auxiliary-infinitive order with which clauses introduced by *jool~~ɨ~~* are associated is triggered by the unfixed situation argument node, which is projected from the Ty(t) node upon parsing *jool~~ɨ~~*.

In this way, whilst clauses introduced by both *kooni* and *jool~~i~~* result in the auxiliary-infinitive order, and are both used in the formation of subordinate clauses, the analysis I provide for them reflects the different relationships they encode between the clauses they connect. Whilst *kooni*-clauses are characterized by a conditional relationship in which one event is dependent upon the other, the relationship between the two events connected by *jool~~i~~*-clauses is one of manner. Whilst the precise details of these analyses are not addressed in the current study, the sketch trees presented in this sub-section propose anlyses which are unified by positing the presence of an unfixed node as part of the processing strategy. As such, these possible routes of analysis can also be used to account for the auxiliary-infinitive order associated with subordinate clauses.

In summary, I analyse Rangi subordinate clauses which are introduced by *kooni* and *jool~~i~~* using an unfixed situation argument node. Such an analysis builds on the analysis proposed by Gregoromichelaki (2006), under which if-clauses and conditionals are modelled using a situation argument node. However, the current analysis extends the notion of situation arguments to include an unfixed situation argument, which I argue to be a natural progression of the framework – combining the notion of structural underspecification in the form of an unfixed node and the situation argument. In the case of *kooni* clauses, the unfixed situation argument node is projected from a LINKed ?Ty(t) tree, which is annotated with a requirement for a copy of the situation argument from the antecedent clause. I also propose that *kooni* results in the projection of the copy of this situation argument formula value. In the case of *jool~~i~~*, the unfixed situation argument node is projected from a ?Ty(t) node and no LINK structure is involved.

Such an analysis has the advantage of maintaining the unfixed node as a trigger for the auxiliary-infinitive order. Although I argue that the situation argument nodes are not necessary for capturing the other processing contexts, I propose that their use in the subordinate clauses appears to be well-motivated on the basis of a prediction of an unfixed node as part of the processing strategy for the subordinate clauses and the

interaction of these constructions with temporal and aspectual information. This is further supported by the use of argument nodes to model if-clauses, as proposed by Gregoromichelaki (2006). Chatzikyriakidis (2010) uses an e_s node as a trigger to model negation in Cypriot Greek. Whilst I have proposed an analysis of negation in Rangi which accounts for the auxiliary-infinitive order without making reference to an additional trigger, the use of the unfixed situation argument node for modelling subordinate clauses may also open up the possibility of a re-examination of negation in Rangi, in light of this ability of the framework.

6.7 Summary

This chapter has provided a formal analysis of the contexts in which the Rangi future tense construction is associated with the auxiliary-infinitive order. The analysis I propose in Chapters 5 and 6 is one under which the placement of the auxiliary in Rangi is regulated by the processing strategies used for the left-peripheral constituents. Whilst on first sight the alternation contexts appear to be a disjoint set of syntactic contexts, I argue that they form a coherent set of processing conditions. In the current chapter I have analysed wh-constructions, sentential negation, cleft constructions, relative clauses and subordinate clauses as all involving an unfixed node as a part of the processing strategy. I claim that the presence of an unfixed node acts as the trigger for auxiliary-infinitive order, whilst the infinitive-auxiliary order discussed in Chapter 5 is found in the absence of this trigger.

I have analysed clause-initial infinitives as being projected onto an unfixed node introduced via the rule of PREDICATE ADJUNCTION. Such an analysis follows on from the availability of PREDICATE ADJUNCTION in the absence of any fixed structure. In instances in which a left peripheral element such as a wh-expression is parsed first, however, the infinitive cannot be projected onto an unfixed predicate node since this would result in the co-existence of two unfixed nodes of the same modality. These nodes would, by definition, have the same tree node address and as such collapse onto each other. As such, in instances in which an unfixed node is already present in the derivation (as the result of parsing a left peripheral element which is projected onto an unfixed node), the auxiliary must be parsed next. This is possible because

the auxiliary projects only a locally unfixed node (which has a distinct treednode address) and a fixed subject node and fixed predicate node, enabling the update to a fixed tree node address of the previously unfixed left peripheral element. The infinitive can subsequently be parsed and, under the analysis I have proposed throughout in Chapter 6, can be immediately projected onto fixed tree structure.

I analyse wh-interrogatives and instances of sentential negation in Rangi as involving unfixed nodes. This follows the standard assumption made within DS, that wh-elements and fronted constituents can be, and frequently are, parsed on an unfixed node (Kempson et al. (2001), Cann et al. (2005b)). I claim that the unfixed node analysis can also be extended to relative clauses, cleft constructions and subordinate clauses, all of which have been modelled in DS using a combination of unfixed nodes and LINK structures (Kempson et al. 2011b; Marten and Kula 2011). The analysis presented for subordinate clauses also employs the concept of underspecification in the form of an unfixed event node.

Analysing left-peripheral elements as annotating an unfixed node follows from the similarities between these constructions. These similarities have been well-noted both cross-linguistically and within different frameworks. However, the relation between these left-peripheral elements and the auxiliary-infinitive order with which they are associated in Rangi is difficult to capture in other frameworks. The analysis I have provided harnesses concepts of general structural underspecification as part of the model of information growth, independent of the particular grammatical role or category of the form which provides the relevant information to be enriched. The analysis I have presented in this thesis therefore provides a coherent analysis of the alternation auxiliary-infinitive contexts.

The auxiliary-infinitive order can therefore be thought to follow from the standard, independent DS restriction on tree growth which prohibits the co-existence of multiple unfixed nodes of the same modality. The analysis I have presented for Rangi is further supported by the proposal of similar accounts for a range of

phenomena in a number of dialects of Modern Greek (see Chatzikyriakidis (2010)) and Medieval Spanish (see Bouzouita (2008b). The use of unfixed nodes and the analyses of unfixed nodes as a trigger for the auxiliary-infinitive order means that apparently diverse patterns in diverse languages can be analysed in similar terms.

These contexts all involve the construction of a highly restricted structurally underspecified tree relation where a node is introduced as unfixed and, as such, necessitates update within the semantic tree. The DS model is aimed at reflecting the fact that on-line choices have to be made about the contribution of a particular piece of information to the overall structure to be developed, including in instances in which the eventual contribution that is to be made is not known at the time at which it is introduced. The use of the unfixed node analysis in these contexts further reflects the fact that these constructions interact with information structure, since the use of unfixed nodes can be employed to achieve contextual effects such as focus. DS does not propose a dedicated strategy for capturing information structure – such as a focus projection – as has been proposed within other frameworks. Instead, the steps which are used to establish propositional structure and their interaction with the context are considered to reflect the information structure associated with the propositional structure.

Significantly, however, only an indirect relation between information structure and the string of words and their semantic representation is proposed in DS. In keeping with this approach, I assume that the alternation contexts in Rangi are the result of a diachronic emergence of generalized parsing triggers. Whilst the factors that motivated this word order from a historical perspective – such as fronting for focus purposes – may still be operative in certain contexts, in other construction types their interaction with information structure has been lost.

By looking at the infinitive-auxiliary order and the alternation contexts, Chapter 5 and Chapter 6 have shown how notions of both structural and content underspecification play a role in the establishment of propositional structure in

context. A central claim of the Dynamic Syntax framework is that the structure of natural languages reflects the way in which 'hearers use natural language to construct representations of context' (Kempson et al. (2011a:61)). As such, the linear surface order of words plays a significant role in DS analyses. The infinitive-auxiliary order, and the associated alternation contexts, provide a challenge to the DS framework since they show a variation in the linear order of the words, but ultimately involve the establishment of the same propositional structure. Since DS does not propose an alternative level of representation, the elements encountered both in the infinitive-auxiliary order and the alternation contexts need to be able to be parsed, with the end result being the establishment of some propositional structure with a future tense interpretation. The analysis adopted achieves this ends, whilst also being able to account for the variation in word order found in Rangi future constructions.

7 Conclusions

7.1 Summary of the thesis

The goal of this thesis has been two-fold. Firstly, to provide a detailed description of Rangi syntax, focusing on auxiliary-based constructions and the marked infinitive-auxiliary order. The motivation for this was to add to the growing body of literature examining Bantu syntax, as well as to provide further descriptive detail of an unusual construction in an erstwhile under-described language. This study provides an account of the marked order found in Rangi and, as such, it introduces broader empirical coverage to the field of Bantu linguistics, in particular in the domain of clausal syntax and word order variation.

The second goal of this thesis is to provide an analysis of auxiliary placement in Rangi from the perspective of the framework of Dynamic Syntax (Kempson et al. 2001; Cann et al. 2005b). Dynamic Syntax (DS) models the way in which speakers establish meaningful content upon hearing utterances in context. By adopting the DS framework, the analysis presented in this thesis demonstrates how meaning in auxiliary-based constructions in Rangi is established incrementally, through a combination of lexical input and computational rules. In so doing, the analyses presented in this study are aimed at probing and extending the theoretical model, as well as providing further evidence in support of the DS framework.

The thesis is structured in order to address these two primary goals. The first two chapters are descriptive in nature. Chapter 2 provides a sketch of Rangi grammar, addressing a perceived shortage of descriptive information on the characteristics of Rangi. This includes an examination of Rangi nominal and verbal morphology, as well as a number of features of Rangi clause structure and syntax. Chapter 3 provides an in-depth description of Rangi auxiliary-based constructions. Data exemplifying these construction types are presented with the aim of providing wide empirical base for the examination of auxiliary constructions in Rangi. Particular attention is paid to the infinitive-auxiliary order and its alternation auxiliary-

infinitive order, which comprised the focus of the thesis. The aim of Chapter 3 is to provide a thorough background to the Rangi auxiliary constructions, establishing the necessary descriptive foundation for the formal analyses provided in Chapters 5 and 6.

Chapter 4 introduces Dynamic Syntax, presenting the tools of the framework and the mechanisms of representation. The chapter highlights the issues that are central to modelling of Bantu languages in Dynamic Syntax; specifically, modelling subject and object information, parsing tense-aspect-mood markers and the contribution made by the verb stem. The assumptions made in the modelling of Rangi clause structure are presented alongside sample derivations of a Swahili utterance and a Rangi utterance. In this way, Chapter 4 provides the background to the framework necessary for the formal analyses developed in the subsequent chapters.

Chapters 5 and 6 present analyses of Rangi auxiliary constructions. In Chapter 5, the auxiliaries *-ija*, *-iise* and *-ri* were examined in turn. Particular attention was paid to the infinitive-auxiliary order which is found in the general and immediate future tenses. The analysis put forward provides a unified account of the contribution made by auxiliaries, whilst also being able to account for the distinct ordering of the auxiliary with regard to the infinitive in the future tense constructions. Chapter 6 builds on the analysis presented in Chapter 5, extending the model to account for the contexts in which auxiliary-infinitive order is found; namely, wh-expressions, sentential negation, cleft constructions, relative and subordinate clauses.

The next section presents a summary of the findings described in this thesis in relation to Rangi auxiliary placement. Whilst the auxiliary *-ija* appears in the canonical preverbal position, the auxiliaries *-iise* and *-ri* are involved in the infinitive-auxiliary order found only in the future tense. The placement of these auxiliaries and the factors affecting their distribution are summarised in section 7.2.

7.2 Rangi auxiliary placement

Rangi employs both simple and complex verb forms to encode temporal and aspectual information. The simplex verb forms are comprised of an obligatory subject marker, a pre-stem marker – either the default *a*-marker or a marker encoding a specific tense or aspect – the verbal base, optional verbal extensions and the obligatory final vowel. The subject prefix, tense-aspect marker, the final vowel and the associated tone pattern combine to encode a specific conjugation. Complex verb forms are comprised of a combination of an inflected auxiliary and either an inflected main verb or an infinitival verb form. Certain tense-aspect combinations in Rangi are available only through the use of complex verb forms. In such instances, the auxiliary introduces the temporal information, whilst the verb hosts the aspectual information.

In most contexts, Rangi auxiliaries are found in the position before the main verb. This is in keeping with the standard auxiliary position for Subject Verb Object (SVO) Bantu languages, in which the auxiliary appears preverbally. However, in the general future tense and the immediate future tense, the auxiliary regularly appears after the verb – which is in the infinitival form. This postverbal positioning of the auxiliary is atypical for East African Bantu languages and contradicts Greenberg's (1963) proposed linguistic universal that SVO languages exhibit auxiliary-infinitive order.[91]

The auxiliary *-íja* is used in the formation of the distant past perfective and distant past habitual verb forms. In the distant past perfective the auxiliary is inflected for subject information whilst the main verb is inflected for subject information and perfective aspect (by the suffix *-ire*). The distant past habitual is also formed using the auxiliary *-íja*, although in this instantiation it appears alongside a main verb inflected with the past habitual suffix *-áa*. In both of these tense-aspect combinations, the auxiliary precedes the main verb.

[91] Three other East African Bantu languages also appear to exhibit infinitive-auxiliary order. These languages – Mbugwe (F34), Gusii (E43) and Kuria (E43) – are discussed in section 7.6.

The auxiliary -*íise* is used solely in the formation of the immediate future tense, where it appears alongside an infinitival verb form. The infinitive hosts no specific tense-aspect information, although it may host the subject marker *kɨ-* and an optional object marker. In declarative main clauses -*íise* consistently appears after the infinitive, resulting in the infinitive-auxiliary order. This order is inverted in a restricted set of syntactic conditions, resulting in auxiliary-infinitive order. These alternation contexts include when the future tense construction forms part of a wh-interrogative, sentential negation, relative or subordinate clause or a cleft construction. In the auxiliary-infinitive construction, the auxiliary is inflected for subject agreement and appears before the infinitival verb form.

In contrast to -*íja* and -*íise*, the auxiliary -*rɨ* appears in a number of different tenses. It has a basic copulative use in the present tense, where it connects a subject with its predicate. It is also used in the formation of the recent past perfective and the general future tense. In its basic copulative use, -*rɨ* is inflected for subject information and is positioned after the subject expression and before the predicate – which is typically an attributive adjective. In its recent past perfective use, -*rɨ* is inflected for past tense by the prefix *áá-* in addition to a subject marker. This inflected form of -*rɨ* appears alongside a main verb inflected for subject information and perfective aspect in the form of the perfective suffix -*ire*. In the recent past perfective forms, -*íja* consistently appears before the main verb. In the general future tense, -*rɨ* is inflected only for subject information. It appears alongside an infinitival verb form and despite no specific temporal morphology, results in a future tense interpretation. The general future tense exhibits the marked infinitive-auxiliary order which is characteristic of Rangi. As was also seen with the immediate future tense auxiliary -*íise*, whilst infinitive-auxiliary order is consistently found in declarative main clauses, the order is inverted in the alternation contexts.

The next section discusses the formal modelling of Rangi auxiliary placement from the perspective of the Dynamic Syntax framework, as was outlined in Chapters 5 and 6. Whilst Chapter 5 provides an analysis of the Rangi infinitive-auxiliary

construction, Chapter 6 analyses the alternation contexts. An overview of these analyses is presented in section 7.3 below.

7.3 Modelling Rangi auxiliary placement

This thesis presented a Dynamic Syntax analysis of auxiliary constructions on the basis of the distribution of auxiliaries in Rangi as described in Chapter 3. I proposed an analysis under which auxiliaries are responsible for the introduction of a fixed subject node and a fixed predicate node, and for the introduction of the temporal information with which they are associated. In the case of the distant past tense auxiliary -*ija* for example, this results in the introduction of distant past tense information to the parsing process. Whilst no analysis of tense is proposed in this thesis, temporal information is represented by an annotation at the root node – Tns(DISTANT PAST) in the case of the distant past.

I also analyse the auxiliary as introducing a metavariable placeholder Fo(**W**) at the predicate node. The predicate metavariable requires update to a full formula value before the derivation is complete – represented by the associated requirement ?∃x.Fo(x). The introduction of a fixed subject node and a fixed predicate node by the auxiliary reflects the historical origin of auxiliaries in lexical verbs. The proposal that Rangi auxiliaries make no lexico-semantic contribution to the derivation is based on the notion that, although they are historically derived from main verbs, auxiliaries are bleached of their lexical content.[92] In an auxiliary construction, the metavariable placeholder on the predicate node reflects that no lexico-semantic contribution is made by the auxiliary. The metavaribale placeholder receives update to a full formula value when the main verb is parsed, enabling the predicate node to receive interpretation.

The analysis of auxiliary-based constructions presented in this thesis relies on the availability of a feature unique to the Dynamic Syntax framework which allows for the re-building of the same structure within a single semantic tree. In simple verb

[92] This has also been proposed across Bantu more widely (see Botne (1989)).

forms this occurs when the pre-stem tense-aspect marker and the verb stem are parsed. Parsing the pre-stem tense-aspect marker was analysed as resulting in the projection of a fixed subject node and a fixed predicate node. Verb stems in inflected verb forms were also analysed as projecting a fixed subject node and a fixed predicate node. The fixed structure introduced upon parsing the verb stem therefore collapses with that introduced by parsing the pre-stem tense-aspect marker. Such an analysis is maintained in order to account for the proposal of the ?Ty(e→t) trigger for parsing verb stems.

The ability to build and re-build the same structure is also seen in auxiliary verb forms. In auxiliary constructions, a locally unfixed node is projected upon parsing the subject marker on the main verb even though (in the standard auxiliary-verb constructions), a fixed subject node has already been established following parsing of the auxiliary. The locally unfixed node projected when the subject marker on the main verb is parsed can only collapse with the subject node if they are of the same noun class. If the subject markers belong to different noun classes, the annotations of these nodes will be incompatible and ungrammaticality will result. In the case of auxiliary constructions, not only is the re-building of this structure possible, it is necessary to ensure the co-referentiality of the two subject markers.

The same building, re-building and collapsing of structure also takes place in auxiliary constructions with the projection of fixed structure by the auxiliary and the verb. The auxiliary was analysed as responsible for the projection of a fixed subject node and a fixed predicate node. These nodes are constructed again upon parsing the main verb, which also introduces a fixed subject node and a fixed predicate node. The analysis presented in this thesis for such auxiliary constructions is dependent on the availability of the building and re-building of this structure. The collapsing of fixed predicate-argument nodes introduced by the main verb with those introduced by the auxiliary, enables the mono-clausal analysis adopted throughout this thesis. Whilst the building and re-building of structure has previously been assumed to be available in DS (see Cann (2005b; 2011)), the centrality of this process in the

analysis presented in this thesis provides further support to its presence in the DS framework and demonstrates the power of the availability of this strategy.

7.4 Modelling Rangi infinitive-auxiliary constructions

The analysis presented in this thesis for the infinitive-auxiliary constructions, is one under which the infinitival verb form is projected onto an unfixed predicate node introduced by the PREDICATE ADJUNCTION rule. The rule of PREDICATE ADJUNCTION has not previously been formalised within Dynamic Syntax. I therefore define it specifically in Chapter 5, as the rule which introduces a predicate node with an unfixed tree node address into a derivation. Whilst the introduction of the PREDICATE ADJUNCTION rule is an innovation, I consider it to be a natural progression for DS, based upon unfixed nodes and predicate nodes which are standardly available in the system.

The availability of the PREDICATE ADJUNCTION rule enables the parsing of the infinitive at the point at which no fixed structure has been introduced – as is the case in the infinitive-auxiliary order. The PREDICATE ADJUNCTION rule introduces an unfixed predicate node onto which the infinitival verb form can be projected. Infinitival verb forms in Rangi (and across Bantu more widely) can appear in a number of different positions within the clause, and exhibit both nominal and verbal properties (see section 2.5.2). The projection of the infinitive onto an unfixed node reflects the fact that at the point at which the infinitive is introduced into the derivation, its eventual position within the tree is not yet known. Whilst the tree node address of the infinitive is unfixed with respect to the root node, if the infinitive is transitive, it will project a fixed ?Ty(e→(e→t)) predicate node and a Ty(e) object argument node. The extent of the predicate-argument structure is determined on the basis of the lexical information provided by predicate in question.

Following the introduction of the unfixed predicate node and the projection of the infinitival verb form onto this unfixed predicate node, the auxiliaries *-íise* and *-rɨ* were both analysed as inducing a fixed subject node and a fixed predicate node. In structural terms, this analysis is the same as the analysis presented for other

auxiliaries and for *-rɨ* in its non-future usage. In the immediate future tense, the tense interpretation follows from parsing the auxiliary *-íise*. In the general future, the tense interpretation follows as a result of parsing *-rɨ* in the presence of an unfixed node. In the infinitive-auxiliary order, this unfixed node is the unfixed predicate node introduced by PREDICATE ADJUNCTION (see section 5.4.3).

Auxiliary placement in the alternation contexts can also be accounted for by reference to structural underspecification. In Chapter 6, I claimed that the auxiliary-infinitive order found in the alternation contexts is triggered by the use of an unfixed node as part of the processing strategy for parsing the left-peripheral elements. These left-peripheral elements include wh-interrogatives, negation markers, clefted elements and subordinators. Following standard DS assumptions, fronted constituents and wh-elements can be projected onto an unfixed node.

Wh-elements were analysed as being projected onto an unfixed node introduced by *ADJUNCTION. I claimed that the unbound negative marker *sí*, found in Rangi sentential negation, can be processed using an unfixed node, which is reflective of its historical relation to the negative copula *sí*, and the connection between negation and focus. The analysis of relative clauses sees the head noun and relative clause annotate separate trees constructed in parallel. These parallel trees share a term and are connected via a LINK relation. The copy of this shared term is projected onto an unfixed node. A similar analysis was also proposed for cleft constructions. Subordinate clauses introduced by *kooni* and *joolɨ* were analysed as involving an unfixed situation argument node which projects the requirement for a copy of the shared term.

Since the system only allows the presence of exactly one unfixed node of a given modality at any stage in the parsing process, the projection of these elements onto an unfixed node at the outset of the parse means that PREDICATE ADJUNCTION cannot apply – since this would lead to the introduction of a second unfixed node. This follows as an independent constraint within the Dynamic Syntax framework, under

which two unfixed nodes of the same modality necessarily have the same tree node identity and, being identical in terms of the Language of Finite Trees, will collapse onto each other. As such, the infinitive cannot be parsed before the auxiliary. I claim therefore that the auxiliary-infinitive order which is found in the alternation contexts, is predictable on the basis of the basic logic of tree growth.

In constructions with auxiliary-infinitive order, instead of the application of the PREDICATE ADJUNCTION rule, the auxiliary is parsed. This results in the projection of fixed minimal predicate-argument structure, which enables the fixing of the tree node address of the unfixed left-peripheral element, which had remained unfixed until this point. With the tree node address of the clause-initial element fixed and the auxiliary parsed, the infinitive can be parsed given the presence of the fixed ?Ty(e→t) trigger. In the alternation contexts, I proposed that the future tense interpretation is the result of parsing the auxiliary in the presence of an unfixed node. This unfixed node will be an unfixed argument node rather than an unfixed predicate node (as is the case in the infinitive-auxiliary order). This is because the left peripheral element has been projected onto an unfixed node. In the case of wh-interrogatives and *sí…t~~ɨ~~k~~ɨ~~* negation, relative clauses and cleft constructions, this unfixed node is a Ty(e) node. In the case of if-clauses introduced by the subordinator *kooni* and *jool~~ɨ~~,* this unfixed node is an unfixed situation argument node Ty(e_s) (see sections 6.2–6.6).

Auxiliary placement in Rangi can therefore be captured by reference to the unfixed node trigger. The presence of an unfixed node at the left periphery triggers the auxiliary-infinitive order. The infinitive-auxiliary order is found in the absence of this structural trigger. The restriction on parsing an infinitival verb form immediately after a fronted constituent follows from the natural restriction on tree growth which is operative within Dynamic Syntax. Given this analysis, auxiliary placement in Rangi can be seen to result from the processing strategy used for the left-peripheral constituents and is predictable on the basis of this.

The proposal of an unfixed node trigger for Rangi auxiliary placement has parallels with the Dyanmic Syntax account provided for clitic placement in Medieval Spanish (Bouzouita 2008b) and a number of dialects of Modern Greek (Chatzikyriakidis 2010). Pronominal clitics in a number of Romance languages and Modern Standard Greek can appear in different positions depending on a number of factors operative on the clause. In Cypriot Greek for example, the unmarked position for the object clitic is postverbal, although the clitic appears pre-verbally in a restricted set of syntactic contexts (Chatzikyriakidis 2010). In Medieval Spanish, some syntactic environments show variation between postverbal and preverbal positioning of clitics. The environments which license only preverbal clitic placement include root clauses where a wh-element, negation adverb, non-coreferential complement or a prepositional or predicative complement appears at the left-periphery (Bouzouita 2008b) .

Of the four contexts associated with preverbal clitic placement in root clauses in Medieval Spanish, the presence of a wh-element and a negation adverb find parallels in the alternation contexts in Rangi. However, similarities are also found in the formal modelling used to account for these structures in Medieval Spanish. As part of her analysis of clitic placement in Medieval Spanish, Bouzouita (2008b) claims that preverbal clitic placement occurs in the presence of certain processing environments, whilst postverbal clitic placement occurs in the absence of these environments. Specifically, Bouzouita (2008b) posits three structural triggers for the preverbal positioning of the clitic in Medieval Spanish futures. These triggers are the presence of:

i) an unfixed node,
ii) a tense requirement, or
iii) the negative feature [+NEG].

Comparison of the triggers proposed by Bouzouita (2008b) for Medieval Spanish and those proposed in this thesis for Rangi show both similarities and differences. The unfixed node trigger for preverbal clitic positioning in Medieval Spanish future constructions is mirrored in the proposal of an unfixed node trigger for preverbal

auxiliary placement in Rangi. However, a tense requirement was not proposed as a trigger preverbal placement of the auxiliary Rangi. The proposal of a negative feature as a trigger reflects the fact that preverbal clitic placement is also found in negation in Medieval Spanish. However, rather than positing the presence of a negative feature as a trigger for Rangi, I proposed that sentential negation could be subsumed under the unfixed node analysis.

In his analysis of four dialects of Modern Greek, Chatzikyriakidis (2010) also proposes that the alternation between proclisis and enclisis is the result of the processing strategy used. In Cypriot Greek for example, enclisis is the unmarked clitic position whilst proclisis occurs with wh-elements, modality and tense markers, focused deictic objects, focused subjects and adverbs, the factive complementizer *pu* and non-imperatives. In order to account for this distribution, Chatzikyriakidis (2010) posits two triggers for proclisis. The presence of:

i) an unfixed node, or
ii) a type e_s requiring node.

The unfixed node trigger for proclisis in Cypriot Greek can be considered analogous to the presence of an unfixed node trigger which I propose for auxiliary-infinitive order in Rangi. The proposal of a type e_s requiring node as a trigger for proclisis in Cypriot Greek can also be considered to be similar to the requirement for a type e_s requiring node in Rangi cleft constructions and relative and subordinate clauses. The difference being that in Cypriot Greek the trigger is a type e_s requiring node, whilst in Rangi the trigger is an unfixed type e_s node.

The parallels between Rangi and Medieval Spanish and dialects of Modern Greek are two-fold. Firstly, this study of Rangi presents data which show an alternation between pre-verbal and post-verbal placement of the auxiliary, albeit only in the future tense constructions. Remarkably, many of the conditions which affect pre- and post-verbal placement of the auxiliary in Rangi are similar to those which

influence the alternation between proclisis and enclisis in Medieval Spanish and Modern Greek.

Secondly, the strategies employed for modelling Rangi, Medieval Spanish and dialects of Modern Greek, all employ structural underspecification. The adoption of an analysis which employs an unfixed node process strategy results in a description of apparently diverse syntactic patterns in unrelated languages in similar terms. The suggestion that an analysis centred around an unfixed situation argument might also be possible for relative and subordinate clauses as well as cleft constructions, has parallels to the situation argument node trigger for Cypriot Greek (Chatzikyriakidis 2010). This may also be considered analogous to the proposal of a tense requirement in Medieval Spanish, with the situation argument proposed as the locus for tense and aspect information. Such observations provide further support for the analysis presented in this thesis, as well as providing additional evidence for viewing the alternation contexts as comprising a coherent set of processing conditions, rather than as a disjunctive set of clause types. Recourse to the same formal mechanisms in the development of abstract analyses for languages from a range of language families, further reflects the ability of DS to model the universality of human language.

7.5 Implications of the analysis for Dynamic Syntax

The analyses presented in this thesis have a number of implications for the Dynamic Syntax framework. This section highlights the theoretical innovation that the introduction of PREDICATE ADJUNCTION has made to DS, as well as drawing attention to the ways in which the analysis presented for Rangi may have deviated from past analyses of Bantu languages.

One of the consequences of the analysis presented in this thesis is the introduction of the rule of PREDICATE ADJUNCTION into the Dynamic Syntax framework. As previously defined, the ADJUNCTION RULES comprised of the rules of *ADJUNCTION, LOCAL *ADJUNCTION, LATE *ADJUNCTION and LINK ADJUNCTION. Whilst each of these rules performs a slightly different function, they are unified by the fact that

they all involve the introduction of a node which has an unfixed tree node address. The rule of *ADJUNCTION introduces a tree node which is unfixed with respect to a given root node. The rule of LOCAL *ADJUNCTION introduces an unfixed argument node dominated by a given root node through an unspecified chain of functor nodes, which is local to a given predicate. The rule of LATE *ADJUNCTION introduces an unfixed node after the node from which the unfixed node is being built has already been annotated with a type value. The rule of LINK ADJUNCTION launches a LINK relation. However, a rule which enables the introduction of an unfixed predicate node has not previously been defined in Dynamic Syntax.

I argue that the modification of the ADJUNCTION rules to include a rule of PREDICATE ADJUNCTION is a natural progression of the framework. I propose that this extension is well-founded on the basis of the availability of different types (Ty(e), Ty(e→t) etc.) within DS, as well as the presence of the ADJUNCTION rules which introduce nodes with underspecified tree node addresses – all of which have previously been defined in DS (Kempson et al. 2001; Cann et al. 2005b).

Another implication of the analysis presented for Rangi in this thesis, relates to analyses of subject information in Bantu languages, particularly Swahili. The analysis of Rangi clause structure provided in this thesis deviates from those provided for Swahili in two ways; the processing of the initial subject NP and the processing of the subject marker. The initial subject NP in Swahili has been analysed within Dynamic Syntax as decorating either a LINK structure or an unfixed node (Marten 2002; Marten and Kempson 2006). Under the LINK structure analysis, the potential subject NP expression annotates an independent tree which is constructed in parallel to the main tree. The flow of information between these two trees is ensured through the establishment of a LINK relation. When the subject marker is parsed, it is interpreted against the backdrop of the information annotating the LINKed tree. Under the unfixed node analysis, the subject NP is projected onto an unfixed node. This unfixed node unifies with the locally unfixed node projected when the subject marker on the verb is parsed. The resulting unfixed node receives a

fixed tree node address at a later stage in the derivation, typically upon parsing the pre-stem tense-aspect marker.

The analysis adopted in this thesis is one under which only the LINK structure analysis is available for Rangi NP subject expressions. Since the presence of an overt NP subject expression in the pre-verbal position in Rangi serves to introduce new information or to provide background information against which the main assertion is assessed, the use of a LINK structure is an appropriate strategy for processing an NP expression. The analysis presented for Rangi therefore gives rise to the question of whether it might be more appropriate to analyse Swahili potential subject NPs as only being able to be introduced via LINK structures, in a move to restrict the contexts in which an NP expression may be parsed. If the two distinct analyses are to be maintained, it raises the question of whether there are empirical differences between the two languages which support the different analyses. Closer examination of subject questions may provide empirical support in favour or against maintaining two different analysis.[93]

The second deviation from the analysis provided for Swahili presented by this study relates to the modelling of the subject markers. The analysis presented for Swahili subject markers is one under which they are projected onto a locally unfixed node introduced via the rule of LOCAL * ADJUNCTION. Under this analysis, the subject marker is seen as responsible only for the annotation of the locally unfixed node. In contrast to this, the analysis provided for Rangi in this thesis considers the subject marker to be responsible for the projection of the locally unfixed node. This analysis follows on from analyses provided for a number of other Bantu languages (see Kempson et al. (2011b) for SiSwati; Marten and Kula (2011) Bemba). The induction of an unfixed node via the lexical input of the subject marker also follows on from

[93] For example, whether subject questions like 'who arrived?' are possible in Rangi, or whether this would have to be expressed as 'It was who that arrived?'. Whilst both options are available in Swahili – *nani alifika* 'who arrived?' and *Ni nani aliyefika* 'It was who that arrived?' if this is not reflected in Rangi, it may provide motivation for distinct analyses of subject expressions in the two languages.

the analyses provided for object clitics in Romance languages and Modern Greek (Chatzikyriakidis 2010). The motivation behind such analyses has been to reduce the role of generalized computational rules in the parsing process and to place a heavier load on the actions induced by the lexical items. The question this gives rise to is to what extent the analyses developed within the Dynamic Syntax framework for similar elements – such as Bantu subject markers – should be similar given little empirical evidence to support deviation between the analyses. However, no further empirical evidence could be provided in support of either analysis. As such, this question will remain merely a consideration as the empirical coverage to which the DS framework is applied continues to be extend.

7.6 Further research

There are a number of possible directions for future research which arise out of the findings of this thesis. One question which arises from the Rangi data relates to the historical origin of the Rangi infinitive-auxiliary order. Rangi has been in sustained contact with non-Bantu languages, primarily the Cushitic languages Iraqw, Burunge and Alagwa. It has been proposed that the atypical constituent order found in Rangi may be the result of contact with these languages (Mous 2000; Nurse 2000; Stegen 2002; Dunham 2005). An alternative proposal is that this marked infinitive-auxiliary order may be the result of internal developments, representing a process of grammaticalization (Heine, p.c. cited in Nurse (2000)).

Whilst an examination of the origin of the infinitive-auxiliary construction is beyond the scope of the current thesis, exploration of this issue would provide a possible channel for future research. Further insights into this question may be gained from comparative studies. Mbugwe – also spoken in central Tanzania – is the language most closely related to Rangi.[94] Mbugwe exhibits the infinitive-auxiliary order in certain syntactic contexts. In contrast to Rangi, the infinitive-auxiliary order in Mbugwe is not restricted to a single tense but is found in present progressive, future, habitual and past imperfective constructions (Mous (2000; 2004) and Vera

[94] Approximately 52% lexical similarity has been proposed for these languages (Gordon 2005; Bergman et al. 2007).

Wilhelmsen, p.c.). The Mbugwe infinitive-auxiliary order can be seen in examples (529)–(531) below (data from Mous (2004:11)).

(529) serera rá mwényi o-lóma re-kénde
5.illlness 5.of 1.visitor 15-bite 5- AUX
'The visitor is ill'

(530) o-ra w-anda nsíye?
15-eat 2nd sg-AUX 9.fish
'Do you eat fish?'

(531) nosíta áa-re o-nyá irusú
15.refuse 1.PAST-AUX 15-drink beer
'He used to refuse beer'

From a diachronic perspective, the observation that the infinitive-auxiliary order is also attested in Mbugwe gives rise to the question of whether the presence of the construction in both languages comes from a common Proto-Rangi-Mbugwe predecessor language. If a contact-induced change account is to be pursued, the related question is whether the infinitive-auxiliary order in the predecessor language may have been the result of contact with Proto-West Rift, as proposed by Kießling et al. (2007:220). An alternative proposal is that the presence of this construction in both Rangi and Mbugwe is the result of independent language contact in each instance, although perhaps with a common language.[95] Further examination of languages spoken in the area, particularly Mbugwe, may contribute to discussion on the origins of the infinitive-auxiliary constructions.

With this goal in mind, further insights may be provided to this matter via an examination of the more distantly related languages Gusii (E42) and Kuria (E43), which are also thought to exhibit infinitive-auxiliary order (Whiteley 1955; 1956; 1960; Cammenga 2002; 2004). Gusii is spoken in Nyanza Province in Western Kenya and Kuria is spoken in the Mara region of Northern Tanzania (Gordon 2005). Since these language remain under-documented, further data would be needed to

[95] The Rangi- and Mbugwe-speaking communities were previously neighbours. Today however, they are separated by speakers of the Cushitic language Gorowa (a dialect of Iraqw).

establish the contexts in which the infinitive-auxiliary order is found. However, Cammenga (2002:501) notes that in Gusii a form of the auxiliary *re*, inflected for subject information is used '...with a focussed or non-focussed infinitive, in order to form a complex tense. Depending on the particular tense, it may precede or follow the infinitive.' The verb forms that appear to exhibit the infinitive-auxiliary order in Gusii are described by Cammenga (2002:488) as 'untimed fact/occasional habit', 'present continuous' and 'recent or far past continuous'.

Haderman (1996) also notes that the infinitive-auxiliary order is attested in a number of Bantu languages from the Bantu zones B.40-B.50 and H.10-H.30, spoken in Gabon, the Republic of Congo, northern Angola and western Democratic Republic of Congo. Haderman (1996) and Dunham (2005) argue however, that an important distinction can be made between those languages in which SOV order can be exploited for discourse-salient purposes – those of zones B.40-50 and H.10-H.30 – and those languages in which SVO order dominates in the majority of syntactic structures, except in highly restricted syntactic contexts, such as in Rangi (and possibly Gusii, Kuria and Mbugwe). However, the possibility of a subset of Bantu languages exhibiting the infinitive-auxiliary order may shed further light on the origins of the Rangi infinitive-auxiliary order and would also be of typological interest.

From a comparative perspective, further examination of non-related languages, particularly the possible contact languages, may also prove illuminating. The primary contact languages for Rangi – Burungwe, Alagwa, Iraqw and Gorowa – all display OV characteristics in their syntax to some extent and exhibit the preverbal clitic cluster which is characteristic of the West Rift languages (Kießling and Mous 2003; Kießling et al. 2007). The preverbal clitic cluster assumes a variety of functions, including co-indexing subject and non-subject arguments, as well as indicating case, tense, clause type (subordination), sequentiality and focus.

Iraqw and Gorowa have a rigid SOV word order in which the verbal noun precedes the auxiliary. Although only a small amount of published material is available on Gorowa, a number of grammars of the closely related Iraqw exist (Whiteley 1958; Nordbustad 1988; Mous 1993). Of particular interest to the case of Rangi is a periphrastic future tense construction in Iraqw which exhibits the order VN+Aux, where VN represents a verbal noun. This construction employs the auxiliary *aw* 'go' and a verbal noun which assumes the role of object, expresses the event. This can be seen in (532) and (533) below (data from Mous (1993:267)).

(532) makay i ma'á mahúngw ay-á
animals S.3 water:CON drinking:CON go:3-pl
'The animals will drink water'

(533) matlo atén a gadyée-r tleehhamá-r aw-aan-a-ká
Tomorrow 1.PL S.1/2 work:CON-F doing:CON-F go-1.pl-INF-NEG
'Tomorrow we will not go to work'

A better understanding of the syntax of these languages, as well as the present and historical socio-linguistic context may provide support to a contact-induced change account of the Rangi infinitive-auxiliary order. Evidence of borrowing, preferably across a variety of domains, including vocabulary and other areas of syntax, may add depth to the contact account which has been proposed in previous studies.

Further understanding of the role of information structure in Rangi and the extent to which (if any) information structure has an impact on the distribution of auxiliaries in the language, could also comprise a possible avenue for further research. Whilst the future tense is regularly encoded with the infinitive-auxiliary order, the fact that the alternation contexts all relate to constructions which are marked in terms of information structure, suggests that, at least historically, information structure may have had some role in the development of this marked order. An examination of infinitive fronting (see, for example, Aboh (1989)), may provide an additional perspective on the information structure account, particularly in terms of the positioning of the infinitival verb. Cysouw (2003) claims that clitic placement in languages in which clitics can appear in one of two positions, is dependent on the

information structure of the sentence. A closer examination of information structure may provide further support for the parallels between clitic placement and auxiliary placement and lead to a better understanding of Rangi auxiliary placement from a cross-linguistic perspective.

7.7 Summary

This thesis adds to the growing body of literature examining Bantu languages. It provides a detailed data-driven account of an under-described language. It adds to our understanding of Bantu syntax, particularly in relation to clausal syntax and word order variation. By examining the infinitive-auxiliary construction found in Rangi, it provides a thorough account of a typologically marked construction type.

The study provides an analysis in which auxiliary placement in Rangi is regulated by the processing strategy used in the incremental establishment of propositional meaning. The formal modelling of the future tense constructions considers the presence of an unfixed node to be the trigger for auxiliary-infinitive order. In contrast, infinitive-auxiliary is found in the absence of this trigger. The analysis is based on the notion that tense-aspect markers and auxiliaries make temporal and aspectual contributions to parses. In some instances, their interpretation is independent of other information in the clause – as with the present progressive marker -*íyo*-. In other instances however, the interpretation of these elements is dependent upon the context in which they are parsed.

The future tense interpretation associated with the general future infinitive-auxiliary construction, was seen to be the result of parsing the auxiliary -*rɨ* in the presence of an unfixed predicate node. That this specific parsing context is shown as part of the trigger in the lexical entry for -*rɨ*, reflects the importance of a formal modelling of Rangi auxiliary constructions which is sensitive to the processing conditions. Crucially, this is central to both the word order – infinitive-auxiliary or auxiliary-infinitive – as well as the temporal interpretation associated with the utterance. The lexical entry for -*rɨ* however, was shown to be highly complex, accounting for the different contribution in makes to the parse in different contexts.

The complexity of the lexical entry for the auxiliary *-rɨ*, with the various conditions in which it can be parsed – and the various attendant interpretations – is reflected in the distinct lexical triggers. Again, the parsing context is central to both the resulting word order and the interpretation that obtains. The complexity of the lexical entry for *-rɨ* may also be reflective of the stages of language change that this morpheme may have gone through, with its different interpretations dependence upon use in subtly different contexts reflecting a series of stages of grammaticalisation.

To conclude, from a theoretical viewpoint, the analysis has provided motivation for the formal definition of the rule of PREDICATE ADJUNCTION. It has employed the mechanism of building and re-building of structure, and has shown how powerful the availability of this mechanism can be in the DS system. The study has drawn out parallels between auxiliary placement in Rangi and clitic placement in unrelated languages. In doing so, it has shown the capacity of the DS framework to capture, in similar terms, apparently distinct syntactic phenomena and distributional properties in unrelated languages, reflecting the ability of DS to model the formal, cognitive nature of human language.

8 Bibliography

Aboh, Enoch, Katharina Hartmann and Malte Zimmermann (eds.) (2007): *Focus strategies: Evidence from African Languages*. Mouton de Gruyter, Berlin/New York.

Akhavan-Zandjani, Firouzeh (1990): *Untersuchungen zur Grammatik des Irangi anhand des materials aus dem Nachlass Dr Paul Berger.* University of Hamburg, Hamburg. MA thesis.

Akinlabi, Akinbiyi (ed.) (1995): *Theoretical approaches to African linguistics*. Africa World Press, Trenton, New Jersey.

Alsina, Alex (1999): 'Where's the Mirror Principle?' *The Linguistic Review*. 16(1): 1–42.

Alsina, Alex and Sam A. Mchombo (1993): 'Object Asymmetries and the Chichewa Applicative Construction'. In: Mchombo, S. A. (ed.) *Theoretical Aspects of Bantu Grammar*. CSLI Publications, Standford. 17–45.

Ashton, Ethel O. (1944): *Swahili Grammar*. Longman, London.

Baker, Mark C. (1988): *Incorporation: A theory of grammatical function changing*. University of Chicago Press, Chicago.

Baltin, Mark and Anthony Kroch (eds.) (1989): *Alternative Conceptions of Phrase Structure*. University of Chicago Press, Chicago.

Bearth, Thomas (2003): 'Syntax'. In: Nurse, D. and G. Philippson (eds.): *The Bantu Languages*. Routledge, London. 121–142.

Benedicto, Elena (ed.) (2001): *The Umass volume on indigenous languages*. GSLA, Amherst, MA.

Bergman, Ted, Joseph Mbongué, Rachel Sowers and Tracy Tooley (2007): *Sociolinguistic survey among the Rangi people*. Unpublished manuscript. SIL International.

Blackburn, Patrick and Wilfried Meyer-Viol (1994): 'Linguistics, Logic and Finite Trees.' *Logic Journal of the IGPL*. 2(1): 3–29.

Bleek, Wilhelm Heinrich Immanuel (1862): *Comparative Grammar of South African Languages*. J.C. Juta and Trübner & Co, Cape Town and London.

Botne, Robert (1989): 'Reconstruction of a grammaticalized auxiliary in Bantu.' *Studies in the Linguistic Sciences*. 19(2): 169–186.

Botne, Robert (2004): 'Specificity in Lusaamia infinitives.' *Studies in Language*. 28(1): 137–164.

Botne, Robert and Paul Newman (eds.) (1989): *Current approaches to African linguistics*. Foris Publications, Dordrecht.

Bouzouita, Miriam (2008a): 'At the Syntax-Pragmatics Interface: Clitics in the History of Spanish'. In: Cooper, R. and R. Kempson (eds.): *Language in Flux: Dialogue Coordination, Language Variation, Change and Evolution*. College Publications, London. 223–265.

Bouzouita, Miriam (2008b): *The Diachronic Development of Spanish Clitic Placement.* King's College London, London. PhD thesis.

Bouzouita, Miriam (2011): 'Future Constructions in Medieval Spanish: Mesoclisis Uncovered'. In: Kempson, R. et al. (eds.): *The Dynamics of Lexical Interfaces*. CSLI Publications, Stanford. 91–132.

Bouzouita, Miriam and Stergios Chatzikyriakidis (2009): 'Clitics as Calcified Processing Strategies'. Proceedings of the LFG09 Conference. Cambridge, CSLI Publications.

Bresnan, Joan (2001): *Lexical-Functional Syntax*. Blackwell, Oxford.

Bresnan, Joan and Jonni M. Kanerva (1989): 'Locative inversion in Chichewa: A case study of factorization of grammar.' *Linguistic Inquiry*. 20(1): 1–50.

Bresnan, Joan and Sam A. Mchombo (1987): 'Topic, Pronoun, and Agreement in Chichewa.' *Language*. 63: 741–782.

Bresnan, Joan and Lioba Moshi (1990): 'Object Asymmetries in Comparative Bantu Syntax.' *Linguistic inquiry*. 21(2): 147–185.

Buell, Leston (2005): *Issues in Zulu verbal morphology.* University of California Los Angeles, Los Angeles. PhD thesis.

Cammenga, Jelle (2002): *Phonology and Morphology of Ekegusii: A Bantu language of Kenya*. Rüdiger Köppe Verlag, Köln.

Cammenga, Jelle (2004): *Igikuria phonology and morphology: A Bantu language of South-West Kenya and North-West Tanzania*. Rüdiger Köppe Verlag, Köln.

Cann, Ronnie (1994): *Formal Semantics: An Introduction*. Cambridge University Press, Cambridge.

Cann, Ronnie (2006): 'Semantic Underspecification and the Interpretation of Copular Clauses in English'. In: von Heusinger, K. and K. Turner (eds.): *Where Semantics Meets Pragmatics*. Elsevier, Oxford. 307–335.

Cann, Ronnie (2007): 'Towards a dynamic account of be in English'. In: Comorowski, I. and K. von Heusinger (eds.): *Existence: Syntax and Semantics*. Kluwer Academic Publishers, Dordrecht. 13–48.

Cann, Ronnie (2011): 'Towards an Account of the English Auxiliary System: Building Interpretations Incrementally'. In: Kempson, R. et al. (eds.): *The Dynamics of Lexical Interfaces*. CSLI Publications, Stanford. 279–317.

Cann, Ronnie, Ruth Kempson, Lutz Marten and Masayuki Otsuka (2005a): 'Right node raising, coordination and the dynamics of language processing.' *Lingua*. 115: 503–525.

Cann, Ronnie, Lutz Marten and Ruth Kempson (2005b): *The Dynamics of Language*. Elsevier, Oxford.

Carstens, Vicki and Frederick Parkinson (eds.) (2000): *Agreement in disguise*. Africa World Press, Trenton, New Jersey.

Casali, Roderic (1998): 'Predicting ATR Activity.' *Chicago Linguistics Society*. 34(1): 55–68.

Chatzikyriakidis, Stergios (2010): *Clitics in Four Dialects of Modern Greek: A Dynamic Account.* King's College London, London. PhD thesis.

Chesi, Cristiano (ed.) (forthcoming): *Directions in derivations*. Emerald, London.

Comorowski, Ileana and Klaus von Heusinger (eds.) (2007): *Existence: Syntax and Semantics*. Kluwer Academic Publishers, Dordrecht.

Contini-Morava, Ellen (2002): '(What) do noun class markers mean?'. In: Reid, W. and R. Otheguy (eds.): *Signal, Meaning, and Message: Perspectives on Sign-Based Linguistics*. John Benjamins, Amsterdam/Philadelphia.

Cooper, Robin and Ruth Kempson (eds.) (2008): *Language in Flux: Dialongue Coordination, Language Variation, Change and Evolution*. College Publications, London.

Cox, Richard and Oliver Stegen (2007): *A Dialect Survey among the Rangi of Tanzania*. Unpublished manuscript.

Creissels, Denis and Danièle Godard (2005): 'The Tswana infinitive as a mixed category'. Proceedings of the HPSG05 Conference. University of Lisbon, CSLI Publications.

Cysouw, Michael (2003): *Towards a typology of pronominal cliticization*. Unpublished manuscript.

Dalrymple, Mary (2001): *Lexical Functional Grammar*. Academic Press, London.

de Cat, Cécile and Katherine Demuth (eds.) (2008): *The Romance-Bantu Connection*. Benjamins, Amsterdam.

Dempwolff, Otto (1916): 'Beträger zur Kenntnis der Sprachen in Deutsch-Ostafrika - Irangi.' *Zeitschrift für Kolonial-Sprachen* 7: 319–326.

Demuth, Katherine (2000): 'Bantu noun class systems: loanword and acquisition evidence for semantic productivity'. In: Senft, G. (ed.) *Systems of Nominal Classification*. Cambridge University Press, Cambridge. 270–292.

Dobrovie-Sorin, Carmen (1994): *The Syntax of Romanian*. Mouton de Gruyter, Berlin.

Doke, Clement Martyn (1955): *Zulu syntax and idiom*. Longmans, London.

Dowty, David R. (1981): *Introduction to Montague Semantics*. Reidel, Dordrecht/London.

Du Plessis, Jacques A. (1982): 'Sentential Infinitives and Nominal Infinitives.' *South African Journal of African Languages*. 2(1): 50–86.

Dunham, Margaret (2004): 'On the verbal system in Langi, a Bantu language of Tanzania (F.33).' *Studies in African Linguistics*. 33(2): 199–234.

Dunham, Margaret (2005): *Eléments de description du langi, langue Bantu F.33 de Tanzanie*. Peeters, Louvain-Paris-Dudley MA.

Ehret, Christopher (1986): 'Proposals on Khoisan reconstruction.' *Sprache und Geschichte in Afrika*. 7(2): 105–130.

Eid, Mushira and Robert R. Ratcliff (eds.) (1997): *Perspectives on Arabic Linguistics X*. John Benjamins, Amsterdam/Philadelphia.

Elderkin, Edward D. (1986): 'Diachronic Inferences from Basic Sentence and Noun Structure in Central Khoisan and Sandawe.' *Sprache und Geschichte in Afrika*. 7: 131–156.

Elderkin, Edward D. (1989): *The significance and origin of the use of pitch in Sandawe.* University of York, York. DPhil thesis.

Emenajo, Emmanuel Nolue and Ozo Ndimele (eds.) (1995): *Issues in African Languages and Linguistics: Essays in Honour of Kay Williamsons*. National Institute for Nigerian Languages, Aba.

Frajzyngier, Zygmunt and Traci S. Curl (eds.) (1999): *Reciprocals: Forms and Functions*. John Benjamins, Amsterdam.

Gazdar, Gerald, Ewan Klein, Geoffrey Pullum and Ivan A. Sag (1985): *Generalized Phrase Structure Grammar*. Blackwell, Oxford.

Good, Jeffrey (2005): 'Reconstructing morpheme order in Bantu: The case of causativization and applicativization.' *Diachronica*. 22: 3–57.

Gordon, Raymond G. (2005): *Ethnologue: Languages of the World (15th Edition)*. SIL International, Dallas.

Greenberg, Joseph H. (1963): 'Some universals of grammar with particular reference to the order of meaningful elements'. In: Greenberg, J. H. (ed.) *Universals of Language*. MIT Press, Cambridge, MA. 73–113.

Gregoromichelaki, Eleni (2006): *Conditionals in Dynamic Syntax.* King's College London, London. PhD thesis.

Grimes, Barbara (ed.) (2000): *Ethnologue (14th Edition)*. SIL International, Dallas.

Güldemann, Tom (1999): 'The genesis of verbal negation in Bantu and its dependency on functional features and clause types'. In: Hombert, J.-M. and L. M. Hyman (eds.): *Bantu historical linguistics: theoretical and empirical perspectives*. CSLI Publications, Stanford. 545–587.

Guthrie, Malcolm (1967–71): *Comparative Bantu*. Gregg, Farnborough.

Hadermann, Pascale (1996): 'Grammaticalisation de la structure infinitive+verbé conjugue dans quelques langues bantoues.' *Studies in African Linguistics*. 25(2): 155–169.

Hadermann, Pascale (1999): 'Les formes nomino-verbales de classes 5 et 15 dans les langues bantoues du Nord-Ouest'. In: Hombert, J.-M. and L. M. Hyman (eds.): *Bantu Historical Linguistics*. CSLI Publications, Stanford. 431–471.

Haegeman, Liliane (ed.) (1997): *Elements of Grammar*. Kluwer Academic Publishers, Dordrecht/London.

Heim, Irene and Angelika Kratzer (1997): *Semantics in Generative Grammar*. Blackwell, Oxford.

Heine, Bernd (1999): 'Polysemy involving reflexive and reciprocal markers in African Languages'. In: Frajzyngier, Z. and T. S. Curl (eds.): *Reciprocals: Forms and Functions*. John Benjamins, Amsterdam. 1–29.

Heine, Bernd, Ulrike Claudi and Friederike Hünnemeyer (1991): *Grammaticalization: A conceptual framework*. University of Chicago Press, Chicago.

Heine, Bernd and Derek Nurse (eds.) (2000): *African Languages: An introduction*. Cambridge University Press, Cambridge.

Heine, Bernd and Mechthild Reh (1984): *Grammaticalization and reanalysis in African languages*. Helmut Buske, Hamburg.

Henderson, Brent (2006): 'Multiple agreement and inversion in Bantu ' *Syntax*. 9(3): 275–289.

Hombert, Jean-Marie and Larry M. Hyman (eds.) (1999): *Bantu historical linguistics: theoretical and empirical perspectives* CSLI Publications, Stanford.

Hornstein, Norbert (1990): *As Time Goes By: Tense and Universal Grammar*. MIT Press, Cambridge.

Horvath, Julia (1968): *FOCUS in the Theory of Grammar and the Syntax of Hungarian*. Foris, Dordrecht.

Hualde, José I. (1989): 'Double object constructions in Kirimi'. In: Botne, R. and P. Newman (eds.): *Current approaches to African linguistics*. Foris Publications, Dordrecht. 179–189.

Hyman, Larry M. (1999): 'The Historical Interpretation of Vowel Harmony in Bantu'. In: Hombert, J.-M. and L. M. Hyman (eds.): *Bantu Historical Linguistics*. CSLI, Stanford. 235–295.

Hyman, Larry M. (2003a): 'Segmental phonology'. In: Nurse, D. and G. Philippson (eds.): *The Bantu Languages*. Routledge, London. 42–58.

Hyman, Larry M. (2003b): 'Suffix Ordering in Bantu: A morphocentric approach'. In: Booij, G. and J. van Marie (eds.): *Yearbook of Morphology 2002*. Kluwer, Dordrecht. 245–281.

Hyman, Larry M. and Sam A. Mchombo (1992): 'Morphotactic constraints in the Chichewa verb stem.' *Berkeley Linguistics Society*. 18: 305–364.

Kaplan, Ronald and Annie Zaenan (1989): 'Long-distance dependencies, constituent structure, and functional uncertainty '. In: Baltin, M. and A. Kroch (eds.): *Alternative Conceptions of Phrase Structure*. University of Chicago Press, Chicago. 17–42.

Kempson, Ruth, Ronnie Cann and Lutz Marten (forthcoming): 'Tree growth Dynamics'. In: Chesi, C. (ed.) *Directions in derivations*. Emerald, London.

Kempson, Ruth and Stergios Chatzikyriakidis (2009): *The Person Case Constraint as a tree-growth property*. Unpublished manuscript. King's College London.

Kempson, Ruth, Eleni Gregoromichelaki and Christine Howes (eds.) (2011a): *The Dynamics of Lexical Interfaces*. CSLI Publications, Stanford.

Kempson, Ruth and Jieun Kiaer (2010): 'Multiple long-distance scrambling: Syntax as reflections of processing.' *Journal of Linguistics*. 46: 127-192.

Kempson, Ruth and Lutz Marten (2002): 'Pronouns, agreement, and the dynamic construction of verb phrase interpretation: A Dynamic Syntax approach to Bantu clause structure.' *Linguistic Analysis*. 32: 471–504.

Kempson, Ruth, Lutz Marten and Nhlanhla Thwala (2011b): 'SiSwati Clefts: The Meeting Ground of Context and Contrast'. In: Kempson, R. et al. (eds.): *The Dyanmics of Lexical Interfaces*. CSLI Publications, Stanford. 23–60.

Kempson, Ruth, Wilfried Meyer-Viol and Dov Gabbay (2001): *Dynamic Syntax: The Flow of Language Understanding*. Blackwell Publishing, London.

Kenesei, István (2006): 'Focus as identification'. In: Molnár, V. and S. Winkler (eds.): *The Architecture of Focus*. Walter de Gruyter, New York and Berlin.

Kesby, John D. (1986): *Rangi Natural Hisotry: The taxonomic procedures of an African people*. Unpublished manuscript.

Kesby, John D. (1996): *The Rangi of Tanzania: An introduction to their culture* HRAF, New Haven.

Kiaer, Jieun (2007): *Processing and Interfaces in Syntactic Theory: the case of Korean.* King's College London, London. PhD thesis.

Kießling, Roland (1994): *Eine Grammatik des Burunge*. Research and Progress, Hamburg.

Kießling, Roland and Maarten Mous (2003): *The lexical reconstruction of West-Rift Southern Cushitic*. Rüdiger Köppe Verlag, Köln.

Kießling, Roland, Maarten Mous and Derek Nurse (2007): 'The Tanzanian Rift Valley area'. In: Heine, B. and D. Nurse (eds.): *A Linguistic Geography of Africa*. Cambridge University Press, Cambridge. 186–227.

Kimenyi, Alexandre (1980): *A Relational Grammar of Kinyarwanda*. University of California Press, Berkeley.

Kinyalolo, Kasangati K. W. (1991): *Syntactic Dependencies and the SPEC-head agreement hypothesis in Kilega.* University of California Los Angeles, Los Angeles. PhD thesis.

Klein, Wolfgang (1994): *Time in Language*. Routledge, London.

Krifka, Manfred (1983): *Zur semantischen und pragmatischen Motivation syntaktischer Regularitäten: eine Studie zur Wortstellung und Wortstellungsveränderung im Swahili*. Fink, München.

Letsholo, Rose M. (2007): 'Who is where: Deriving right edge WH phrase in Ikalanga WH constructions.' *Lingua*. 117(6): 986–1007.

Maganga, Clement and Thilo C. Schadeberg (1992): *Kinyamwezi - Grammar, Texts, Vocabulary*. Rüdiger Köppe, Köln.

Maho, Jouni F. (1999): *A comparative study of Bantu noun classes*. Acta Universitatis Gothoburgensis, Göteborg.

Maho, Jouni F. (2003): 'A classification of the Bantu languages: an update of Guthrie's referential system'. In: Nurse, D. and G. Philippson (eds.): *The Bantu languages*. Routledge, London. 639–651.

Marten, Lutz (2002): *At the Syntax-Pragmatics Interface: Verbal Underspecification and Concept Formation in Dynamic Syntax*. Oxford University Press, Oxford.

Marten, Lutz (2005): 'The dynamics of agreement and conjunction.' *Lingua*. 115: 527–547.

Marten, Lutz (2007): 'Focus strategies and the incremental development of semantic representations: evidence from Bantu'. In: Aboh, E. et al. (eds.): *Focus strategies: Evidence from African Languages*. Mouton de Gruyter, Berlin/New York.

Marten, Lutz (2010): 'Information structure and agreement: Subjects and subject agreement in Swahili and Herero.' *Lingua*. 121(5): 787–804.

Marten, Lutz and Ruth Kempson (2006): 'Pronouns, agreement, and the dynamic construction of verb phrase interpretation: A Dynamic Syntax approach to Bantu clause structure.' *Linguistic Analysis*. 32: 471–504.

Marten, Lutz, Ruth Kempson and Miriam Bouzouita (2008): 'Concepts of structural underspecification in Bantu and Romance'. In: de Cat, C. and K. Demuth (eds.): *The Romance-Bantu Connection*. Benjamins, Amsterdam. 3–39.

Marten, Lutz and Nancy C. Kula (2011): 'The Prosody of Bemba Relative Clauses: A Case Study of the Syntax-Phonology Interface in Dynamic Syntax'. In: Kempson, R. et al. (eds.): *The Dynamics of Lexical Interfaces*. CSLI Publications, Stanford. 61–90.

Marten, Lutz, Nancy C. Kula and Nhlanhla Thwala (2007): 'Parameters of morphosyntactic variation in Bantu.' *Transactions of the Philological Society* 105: 253–338.

McCormack, Anna (2008): *Subject and Object Pronominal Agreement in the Southern Bantu Languages: from a Dynamic Syntax Perspective.* School of Oriental and African Studies, University of London, London. PhD thesis.

Mchombo, Sam A. (1993a): 'Reflexive and Reciprocal in Chichewa'. In: Mchombo, S. A. (ed.) *Theoretical Aspects of Bantu Grammar*. CSLI Publications, Stanford. 181–207.

Mchombo, Sam A. (ed.) (1993b): *Theoretical Aspects of Bantu Grammar*. CSLI Publications, Stanford.

Meeussen, Achille Emille (1967): 'Bantu grammatical reconstructions.' *Africana Linguistica* 3: 79–121.

Meeussen, Achille Emille (1979): 'Vowel Length in Proto-Bantu.' *Journal of African Languages and Linguistics*. 1: 1–7.

Meinhof, Carl F. M. (1899): *Grundriss einer Lautlehre der Bantusprachen*. F. A. Brockhaus, Leipzig.

Meinhof, Carl F. M. and Nicolaas Jacobus van Warmelo (1932): *Introduction to the phonology of the Bantu languages*. Dietrich Reimer, Berlin.

Miehe, Gudrun (1979): *Die Sprache der älteren Swahili-Dichtung: Phonologie und Morphologie*. Dietrich Reimer, Berlin.

Mous, Maarten (1993): *A grammar of Iraqw*. Helmut Buske, Hamburg.

Mous, Maarten (2000): 'Counter-universal rise of infinitive-auxiliary order in Mbugwe (Tanzania, Bantu, F34.)'. In: Vossen, R. et al. (eds.): *Mehr als nur Worte...: afrikanistische Beiträge zum 65. Geburtstag von Franz Rottland* Rüdiger Köppe, Köln. 469–481.

Mous, Maarten (2003): *The making of a mixed language: The case of Maá/Mbugu.* John Benjamins, Amsterdam.

Mous, Maarten (2004): *A grammatical sketch of Mbugwe: Bantu F34, Tanzania*. Köppe, Köln

Muriungi, Peter Kinyua (2005): 'Wh-Questions in Kitharaka.' *Studies in African Linguistics*. 32(1): 43–104.

Ngunga, Armindo (2000): *Phonology and Morphology of the Ciyao Verb*. CSLI Publications, Stanford.

Nicolle, Steve (2007): 'The grammaticalization of tense markers: A pragmatic reanalysis.' *Cahiers Chronos*. 17: 47–65.

Nordbustad, Fröydis (1988): *Iraqw Grammar: An Analytical Study of the Iraqw Language*. Dietrich Reimer, Berlin.

Nurse, Derek (1999): 'Towards a Historical Classification of East African Bantu Languages'. In: Hombert, J.-M. and L. M. Hyman (eds.): *Bantu Historical Linguistics*. CSLI Publications, Stanford. 1–41.

Nurse, Derek (2000): 'Diachronic morphosyntactic change in Western Tanzania'. In: Vossen, R. et al. (eds.): *Mehr als nur Worte...: afrikanistische Beiträge zum 65. Geburtstag von Franz Rottland*. Rüdiger Köppe, Köln. 517–534.

Nurse, Derek (2003): 'Aspect and tense in Bantu languages'. In: Nurse, D. and G. Philippson (eds.): *The Bantu Languages*. Routledge, London. 90–102.

Nurse, Derek (2006): 'The Emergence of Tense in Early Bantu'. 37th Annual Conference on African Linguistics. University of Oregon, Cascadilla Proceedings Project, Somerville, MA.

Nurse, Derek (2008): *Tense and Aspect in Bantu*. Oxford University Press, Oxford.

Nurse, Derek and Gerard Philippson (eds.) (2003): *The Bantu languages*. Routledge, London.

Nurse, Derek and Gerard Philippson (2006): 'Common tense-aspect markers in Bantu.' *Journal of African Languages and Linguistics*. 27(2): 155–196.

Ouhalla, Jamal (1997): 'Remarks on focus in Standard Arabic'. In: Eid, M. and R. R. Ratcliff (eds.): *Perspectives on Arabic Linguistics X*. John Benjamins, Amsterdam/Philadelphia. 9–45.

Peterson, David (1999): *Discourse-Functional, Historical, and Typological Aspects of Applicative Constructions.* University of California, Berkeley. PhD thesis.

Pollard, Carl and Ivan A. Sag (1987): *Information-Based Syntax and Semantics*. CSLI Publications, Chicago.

Pollard, Carl and Ivan A. Sag (1994): *Head-Driven Phrase Structure Grammar*. CSLI Publications, Chicago.

Poulos, George (1990): *A Linguistic Analysis of Venda*. Via Afrika, Pretoria.

Reichenbach, Hans (1947): *Elements of Symbolic Logic*. Harcourt, Collier-Macmillan, New York.

Riedel, Kristina (2009): *The syntax of object marking in Sambaa: A comparative Bantu perspective.* Leiden University Centre for Linguistics, Leiden. PhD thesis.

Rizzi, Luigi (1997): 'The fine structure of the left periphery'. In: Haegeman, L. (ed.) *Elements of Grammar*. Kluwer Academic Publishers, Dordrecht/London. 281–337.

Rugemalira, Josephat (2007): 'The Structure of the Bantu Noun Phrase.' *SOAS Working Papers in Linguistics*. 15: 135–148.

Sacleux, Charles P. (1909): *Grammaire des dialectes swahilis*. Procure des PP. du Saint-Esprit, Paris.

Sag, Ivan A. and Thomas Wasow (1999): *Syntactic Theory: A Formal Introduction*. CSLI Publications, Stanford.

Sag, Ivan, Thomas Wasow and Emily Bender (2003): *Syntactic Theory: A formal introduction*. CSLI Publications, Stanford.

Schadeberg, Thilo C. (1995): 'Object diagnostics in Bantu'. In: Emenajo, E. N. and O. Ndimele (eds.): *Issues in African Languages and Linguistics: Essays in Honour of Kay Williamson*. National Institute for Nigerian Languages, Aba. 173–180.

Schadeberg, Thilo C. (2003a): 'Derivation'. In: Nurse, D. and G. Philippson (eds.): *The Bantu languages*. Routledge, London. 71–89.

Schadeberg, Thilo C. (2003b): 'Historical linguistics'. In: Nurse, D. and G. Philippson (eds.): *The Bantu languages*. Routledge, London. 143–163.

Schladt, Mathias (1996): *Reciprocals in Bantu languages: A case of grammaticalization*. Unpublished manuscript. University of Cologne.

Schladt, Mathias (2000): 'The typology and grammaticalization of reflexives'. In: Frajzyngier, Z. and T. S. Curl (eds.): *Reflexives: Forms and Functions*. John Benjamins, Amsterdam. 103–124.

Schwarz, Florian (2004): 'Focus Marking in Kikuyu.' *ZAS Papers in Linguistics*. 30: 41–118.

Sebeok, Thomas A. (ed.) (1971): *Linguistics in Sub-Saharan Africa*. Mouton, The Hague and Paris.

Seidel, August (1898): 'Grammatik der Sprache von Irangi'. In: Werther, C. W. (ed.) *Die mittlern Hochländer des nördlichen Deutsch-Ost-Afrika*. Hermann Paetel, Berlin. 387–434.

Sener, Serkan and Selçuk Issever (2003): 'The interaction of negation with focus: ne...ne...phrases in Turkish.' *Lingua*. 113: 1089–1117.

Senft, Gunter (ed.) (2000a): *Systems of nominal classification*. Cambridge University Press, Cambridge.

Senft, Gunter (2000b): 'What do we really know about nominal classification systems?'. In: Senft, G. (ed.) *Systems of nominal classification*. Cambridge University Press, Cambridge. 11–49.

Stegen, Oliver (2001): *To be, or not to be: functions of copula and auxiliaries in Rangi*. Unpublished manuscript. SIL Tanzania.

Stegen, Oliver (2002): 'Derivational processes in Rangi.' *Studies in African Linguistics*. 31(1/2): 129–153.

Stegen, Oliver (2004): 'A pilot study of writing in Rangi society.' *Edinburgh Working Papers in Applied Linguistics*. 13: 102–111.

Stegen, Oliver (2005): 'Editing Rangi narratives: a pilot study in literature production.' *Edinburgh Working Papers in Applied Linguistics*. 14: 68–98.

Stegen, Oliver (2006): *Participatory Research, TAM Functions, and Dialect Survey Among the Rangi*. Unpublished manuscript.

Stegen, Oliver (2007): 'Lexical density in oral versus written Rangi texts.' *SOAS Working Papers in Linguistics*. 15: 173–184.

Stegen, Oliver (2011): *In quest of a vernacular writing style for the Rangi of Tanzania: Assumptions, processes, challenges.* University of Edinburgh, Edinburgh. PhD thesis.

Thwala, Nhlanhla (2006): 'Parameters of variation and complement licensing in Bantu.' *ZAS Papers in Linguistics*. 43: 203–216.

van der Wal, Jenneke (2009): *Word order and information structure in Makhua-Enahara.* University of Leiden Centre for Linguistics, Leiden. PhD thesis.

Visser, Mariana A. (1989): 'The syntax of the infinitive in Xhosa.' *South African Journal of African Languages*. 9(4): 154-185.

Vossen, Rainer, Angelika Mietzner and Antje Meissner (eds.) (2000): *Mehr als nur Worte...:afrikanistische Beiträge zum 65. Geburtstag von franz Rottland*. Rüdiger Köppe, Köln.

Westphal, Ernst O. J. (1971): 'The click languages of Southern and Eastern Africa '. In: Sebeok, T. A. (ed.) *Linguistics in Sub-Saharan Africa*. Mouton, The Hague and Paris. 367–420.

Whiteley, Wilfred H. (1955): *The structure of the Kuria verbal and its position in the sentence.* University of London, London. PhD thesis.

Whiteley, Wilfred H. (1956): *A practical introduction to Gusii*. East African Institute of Social Research, Dar es Salaam/Nairobi/Kampala.

Whiteley, Wilfred H. (1958): *A short description of item categories in Iraqw (with material on Gorowa, Alagwa and Burunge)*. East African Institute on Social Research, Kampala.

Whiteley, Wilfred H. (1960): *The tense system of Gusii*. East African Literature Bureau, Kampala

Woolford, Ellen (1995): 'Why passive can block object marking'. In: Akinlabi, A. (ed.) *Theoretical approaches to African linguistics*. Africa World Press, Trenton, New Jersey. 199–215.

Woolford, Ellen (2000): 'Agreement in disguise'. In: Carstens, V. and F. Parkinson (eds.): *Advances in African Linguistics*. Africa World Press, Trenton, New Jersey. 103–117.

Woolford, Ellen (2001): 'Conditions on object agreement in Ruwund (Bantu)'. In: Benedicto, E. (ed.) *The Umass volume on indigenous languages*. GLSA, Amherst, MA. 177–201.

Wright, Richard, Ian Maddieson, Peter Ladefoged and Bonny Sands (1995): 'A phonetic study of Sandawe clicks.' *UCLA Working Papers in Phonetics*. 91: 1–24.

Zeller, Jochen (2010): *Semantic locative inversion and predication in Zulu*. Unpublished manuscript. University of KwaZulu Natal.