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The morphosyntax of Katcha nominals: A Dynamic Syntax account

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Doctor of Philosophy

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To the people of the Nuba Mountains

Abstract

This thesis presents a new description and theoretical analysis of the nominal system of Katcha (Nilo-Saharan, Kadu), spoken in the Nuba Mountains of Sudan. The description and analysis are based on a synthesis of data from several sources, including unpublished archive material and original fieldwork. The study is placed in context with a discussion of the demographic, cultural and political background affecting the Katcha linguistic community, a review of the current state of linguistic research on Katcha and a discussion of the ongoing controversy over the place of the Kadu languages within the language phyla of Africa.

The morphosyntactic descriptions first focus on the role of nominals as heads, considering phenomena such as classification, agreement and modification. It is shown that Katcha has a unusual system of gender agreement with three agreement classes based on the concepts of Masculine, Feminine and Plural and that the gender of a noun may change between its singular and plural forms. Surprisingly, these phenomena are both most commonly found in Afro-Asiatic, which is not a phylum to which Kadu has previously been ascribed. The gender changes are shown to be predictable, determined by number-marking affixes. The study then gives a unified analysis of various types of nominal modifiers; relative clauses, possessives, demonstratives and adjectives all display similar morphological properties and this is accounted for by analysing all modifiers as appositional, headed by a demonstrative pronoun. This analysis of modifiers shows them to be related to, though not the same as, the notions of relative markers and construct state found widely in African languages.

The role of nominals within sentential argument structure is then considered, with discussion of phenomena such as prepositional phrases, case and verbal valency. From the interaction of prepositions and pronouns, it is tentatively concluded that Katcha has three cases: Nominative, Accusative and Oblique. From the interaction of verbs and nouns, it is demonstrated that the verbal suffixes known as ‘verb extensions’ primarily serve to license the absence of otherwise mandatory core arguments.

The second part of the thesis provides a theoretical analysis of the nominal system within the framework of Dynamic Syntax (DS). Two key features of the DS formalism come into play. Firstly, DS construes semantic individuals as terms of the epsilon calculus. Verb extensions are analysed as projecting context-dependent epsilon terms, providing a value for the ‘missing’ argument. Secondly, DS allows information sharing between propositions by means of a ‘LINK’ relation. Prepositional phrases are analysed as projecting a subordinate proposition which shares an argument with the matrix tree.

These two formal tools come together in the analysis of nominal modifiers, which are construed as projecting an arbitrarily complex epsilon term LINKed to some term in the matrix tree, directly reflecting their descriptive analysis as appositional nominals.

In presenting new data for a little studied language, this thesis adds to our knowledge and understanding of Nuba Mountain languages. In describing and analysing some of the typologically unusual features of Katcha's nominal system, it challenges some standard assumptions about these constructions and about the genetic affiliation of the Kadu family. And in the theoretical analysis it demonstrates the suitability of Dynamic Syntax to model some of the key insights of the descriptive analysis.

Acknowledgements

Of making many books there is no end, and much study wearies the body.
(Ecclesiastes 12:12)

I used to think I was quite a got-it-all-together kind of person. Until I did a PhD. Now I know what the Teacher was getting at. There's no way I could have got to submitting a thesis without the help of a cast of thousands. Some of them are people who helped me with my research and study-related things, without whom I could never have completed this. Others are people who helped me by dragging me away from my research and study-related things, thereby keeping me sane (relatively speaking). And a few people, remarkably, did both.

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Bottom of the page, but top of the list go my amazing, beautiful Kathie, Nathaniel and Joanna, who somehow are still putting up with me. Love you always.

Declaration

I declare that this thesis was composed by myself, that the work contained herein is my own except where explicitly stated otherwise in the text, and that this work has not been submitted for any other degree or professional qualification except as specified.

Darryl Turner

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List of Abbreviations

1	1st person	k.o.	kind of
2	2nd person	LOC	locative
3	3rd person	M	masculine
ACCOMP	accompaniment	MED	medial (demonstrative)
ANTIP	antipassive	MID	middle voice
APPL	applicative	N	neuter
BEN	benefactive	OBL	oblique
CERT	certainty	PASS	passive
CSTR	construct	P	plural gender
DAT	dative	PFV	perfective
DCM	dependent clause marker	PL	plural
DEF	definite article	POSS	possessive
DEM	demonstrative	PREP	preposition
DIR	directional	PROSP	prospective
DIST	distal (demonstrative)	PROX	proximal (demonstrative)
EXCL	exclusive	RECIP	reciprocal
F	feminine	REL	relative marker
IMP	imperative	SG	singular
INCL	inclusive	SUBJ	subject marker
INF	infinitive	UNACC	unaccusative
INSTR	instrumental		

PART I
Preliminaries

Chapter 1

Introduction

This thesis presents a new description and theoretical analysis of the nominal system of the Katcha language.

Katcha is spoken in the Nuba Mountains of Sudan, and like the majority of Nuba languages, is relatively endangered and relatively little-studied. It is a member of the Kadu language family, whose genetic classification has been the subject of considerable debate over the years. The description offered here is based on a synthesis of data from several sources, including unpublished archive material and original fieldwork, and represents a considerable increase in the amount of Katcha data publicly available. Several of the findings are noteworthy from the point of view of typology and cross-linguistic comparison. The descriptive analyses are summarised in section 1.2 below.

The theoretical analyses use the framework of Dynamic Syntax (Kempson *et al.* 2001; Cann *et al.* 2005). This framework has previously been applied to Bantu languages, but not to any African languages outside that family. Applying a framework to new language data from a relatively unknown language family is a good test of the framework's flexibility in adapting to handle constructions other than the 'usual suspects' of Germanic and Romance; it is also a good test of a theory's ability to make sense of the data. I have found some of the phenomena analysed here more comprehensible as a result of looking at them in the light of Dynamic Syntax, but the framework has also had to be adjusted and extended in the light of the Katcha data. Such interaction between theory and data can only be healthy. The theoretical analyses are summarised in section 1.3 below.

1.1 Preliminaries

Chapter 2 aims to place the study in context, beginning with a discussion of the demographic, cultural and political background affecting the Katcha linguistic community. The following sections then go on to review the current state of linguistic research on Katcha. The majority of published research relevant to Katcha has been in the area of genetic classification, and the chapter discusses the ongoing controversy over the place of the Kadu languages within the language phyla of Africa. The discussion then moves on to summarize the descriptions and analyses that have been produced for Katcha (and related languages) up to this point, much of which is unpublished. Of particular importance is the work of Roland Stevenson, whose substantial collection of papers are archived in the library of UCLA, and this is commented on at length, though more recent research is also evaluated. It is notable that while the genetic affiliation of Katcha and its relatives has been the topic of some vigorous debate, and there has been a moderate level of investigation of phonology, much less work has been carried out in the area of morphosyntax. As such, there is a gap which it is hoped this study will fill, at least partly. Having reviewed the pre-existing data, the chapter gives a brief overview of the novel data this study will contribute and the original fieldwork on which it was based, before finishing with a discussion of how the the study may beneficially fit within the contexts described.

Chapter 3 summarizes basic aspects of the phonology of Katcha. Significantly more research has been carried out on phonology in recent years than on morphosyntax and the chapter draws on these studies, along with fieldwork observations, to provide the necessary phonological background to the thesis. The chapter gives an overview of the consonants, vowels and tones of Katcha. It then explains the orthographic conventions followed through the rest of the thesis.

1.2 Morphosyntactic Descriptions

The language description focuses on the nominal system. The first half, chapters 4 and 5, focuses on the role of nominals as heads, considering phenomena such as classification, agreement and modification. The second half, chapters 6 and 7, focuses on nominals as dependents and arguments, considering phenomena such as prepositional phrases, case and verbal valency.

Chapter 4 describes nominal classification in Katcha. Katcha has an interaction between the categories of Number and Gender which is typologically unusual and is also relevant to the wider debate about the genetic affiliation of the Kadu family. The chapter begins with a discussion of number marking, presenting the variety of singulative and plurative prefixes with which number is marked on Katcha nouns. It is

demonstrated that these show the typically Nilo-Saharan characteristic of occurring in a tripartite distribution, where some nouns take plurative affixes, some take singulative affixes and some take both. However, it is also demonstrated that among the third group are nouns which show the typically Niger-Congo characteristic of occurring in classes which have a semantic basis and are indicated morphologically by their number affixes. Following the discussion of number is a discussion of gender, which establishes that agreement in Katcha is based on three gender classes, and not on two gender classes plus plural number as has sometimes been suggested. Having described number marking and gender classification, the discussion moves on to the interaction between these two categories. It is shown that for morphologically number-marked nouns the affix, rather than the noun root, assigns gender to the noun. This can result in ‘polarity’ where the gender of a noun in the singular may be different from its gender in the plural. Interestingly, polarity is most commonly found in Afro-Asiatic, meaning that the number system shows some properties of all three North-East African language phyla. Finally, this chapter argues that the semantic basis of the third gender class is the notion of plurality and that Katcha is best described as having a three-class gender system of Masculine, Feminine and Plural. Such systems have been argued to exist in some Cushitic languages, but to my knowledge this is the first time it has ever been recorded outwith that language family.

Chapter 5 presents a description and unified analysis of Katcha nominal modifiers, of which there are three main types: demonstratives, possessors and relative clauses. It is noted that in each case, nominal modifiers display gender agreement with the modified noun, carry morphological marking when the modified noun is a peripheral argument of the verb, and occur in ‘headless’ constructions where there is no overt noun to be modified (in which case they have a pronominal interpretation). It is then argued that nominal modifiers are all demonstrative pronouns, or phrases headed by demonstrative pronouns, which are appositional to the modified noun. With the exception of the medial and distal demonstratives, all modifiers are introduced by morphemes of a similar form. Phonological evidence is presented that suggests that these occur in complementary distribution and are therefore allomorphs. It is then argued that this modifying morpheme is the proximal demonstrative pronoun, allowing the incorporation of the medial and distal demonstratives into the same system and explaining why the latter have a different form, but identical distribution to all other nominal modifiers. This chapter finishes with some cross-linguistic perspective by discussing the relationship between the analysis of Katcha outlined here and two notions which have been argued to be appropriate to a number of African languages: the ‘relative marker’ and the ‘construct state’. It is suggested that both of these typically African constructions may result from grammaticalization of the demonstrative pronoun which heads the nominal modifier.

Chapter 6 describes personal pronouns in Katcha and aims to explain the differences between the various forms. There are two basic sets of pronominal forms: ‘core’ pronouns and ‘oblique’ pronouns. The choice of pronominal form is dependent on its role in the sentence and, in oblique cases, the preposition it follows. A description of prepositions and similar morphemes, including the pronominal forms they select, is therefore also presented in section 6.3 along with other aspects of the prepositional system, such as the modification of prepositional phrases by adverbs or by further prepositional phrases and the lexical selection of prepositions by certain verbs. The chapter concludes by returning to the discussion of pronominal forms, where it is suggested that these different forms may be best described as realisations of case. Taking into account evidence from tone alternations and typological universals, it is tentatively concluded that Katcha personal pronouns occur in one of three cases: Nominative, Accusative and Oblique.

Chapter 7 describes the derivational verbal suffixes known as ‘verb extensions’ (VEs), whose function is to increase or decrease semantic valency, licensing or prohibiting the presence of nominals as arguments within the proposition. The vast majority of VEs in Katcha are detransitivising, their function being to license the absence of otherwise mandatory core arguments. A descriptive analysis is given classifying them according to the number and type of their argument roles. In addition to the valency reducing VEs, Katcha has one morpheme which appears to be valency increasing, namely the applicative, though it is noted that in several ways the Katcha ‘applicative’ is rather atypical. Finally, reciprocal and reflexive forms are discussed. These are functionally similar to the valency decreasing verb extensions of section 7.2, but it is suggested that they may in fact be pronominal constructions.

1.3 Theoretical Analyses

The second part of the thesis provides a theoretical analysis of the nominal system of Katcha within the framework of Dynamic Syntax (DS). Two key features of the DS formalism come into play. Firstly, DS construes semantic individuals as terms of the epsilon calculus. This feature is utilised in the analysis of verb extensions (chapter 8), which are construed as projecting context-dependent epsilon terms, providing a value for the ‘missing’ argument. Secondly, DS allows information sharing between propositions by means of a ‘LINK’ relation. This feature is utilised in the analysis of adjuncts such as prepositional phrases (chapter 9), which are construed as projecting a subordinate proposition which shares an argument with the matrix tree. These two formal tools come together in the analysis of nominal modifiers (chapter 10), which are construed as projecting a possibly complex epsilon term LINKed to some term in the matrix tree, directly reflecting their descriptive analysis as appositional nominals.

Chapter 8 presents a Dynamic Syntax analysis of valency-reducing verb extensions. The difference between a transitive verb with object pro-drop on the one hand, and an antipassive verb on the other, is that the transitive verb projects an object metavariable allowing a referential argument whereas the antipassive saturates its object node with a context-dependent epsilon term. Such a term picks out an arbitrary witness of some predicate defined as being dependent on the immediate context. The epsilon term is thus a semantic object of minimal content, whose reference is both arbitrary and entirely context-dependent. Heavily context-dependent objects of this kind allow a straightforward analysis of reduced valency constructions such as ‘Drums are beaten (by some arbitrary agent of drum beating)’.

Chapter 9 outlines a Dynamic Syntax approach to prepositional phrases which construes them as adjuncts, constructing LINKed structure from whichever node of the main propositional tree they modify. The analysis is developed by applying it not only to prepositional phrases, but also to other relevant constructions in the Katcha data. Prepositional phrases which have an intersective interpretation modify a term, either an individual or an event. They are construed as building a LINKed propositional tree that provides extra information about some argument in the matrix proposition. As such they are similar to relative clauses, and use the same technical apparatus as standard DS treatments of relatives. The formal details of the process are refined slightly in order to extend the analysis to handle the recursive locative prepositional phrases common in Katcha. This refinement makes use only of DS tools that have been proposed independently for other constructions in other languages. Prepositional phrases which have a subsecutive interpretation modify predicates. They are construed as building a LINKed tree providing extra information about some predicate in the matrix proposition. The analysis is then extended to locative adverbs, construing them as modifying a predicate projected by the locative preposition, thus bringing together the analyses of the two types of modification. Lastly, the analysis is applied to applicatives, arguing that these may be treated much like prepositions, the only real difference being that the applicative morpheme does not form a syntactic constituent with its complement. The chapter finishes by discussing the notion of case in the light of the analysis presented for prepositional phrases and it is suggested that this may shed light on indirect and applied objects, topicalised subjects and the form of personal pronouns in Katcha.

Chapter 10 provides a Dynamic Syntax analysis of nominal modifiers, following on from the arguments advanced in chapter 5 that nominal modifiers are appositional demonstrative pronouns, or are phrases headed by them. The implementation begins with an analysis of Katcha nouns, noting that lexical nouns cannot be modified internally and so must project a fully specified epsilon structure, and a discussion of the process of LINK Apposition and its evaluation which are used to allow modification.

Demonstratives are also covered, with a discussion of how the anaphoric nature of a demonstrative pronoun allows it to add specific reference to a lexical noun phrase. This is followed by an analysis of subject relative clauses and possessors. Crucial to these is an extension to the notion of the metavariable projected by the demonstrative pronoun such that it projects a partial epsilon term with a variable and binder, but no restrictor. The restrictor is then provided by the relative clause or in the case of a possessive, a contextually provided possession predicate. This analysis of the Katcha demonstrative pronoun has the beneficial consequence that it correctly predicts the fact that possessive phrases in Katcha are head-marking rather than dependent-marking and also the fact that that non-subjects may not be relativised directly.

1.4 Overall aims

This study is very much data-led. It does not set out with a specific hypothesis to be tested (other than the very general hypothesis that Dynamic Syntax may be a suitable framework for the analysis of phenomena found in Nilo-Saharan languages). Rather, the goal has been to investigate the Katcha language with an open mind, find out what is interesting about it and then try to provide a Dynamic Syntax analysis for that.

The order in which the study is presented, with the morphosyntactic descriptions in part II separate from the theoretical analyses in part III, reflects this process. It also serves to make the study more accessible. In order to be of benefit to the widest possible range of readership, I have endeavoured to keep the descriptive analysis as general and atheoretical as possible. It is hoped that those whose interest is in questions of typology, the description of Nuba languages or the genetic affiliation of Kadu, but who do not have a background in Dynamic Syntax or formal semantics, may find at least the first two-thirds of the thesis to be of use and of interest. It is hoped that the new data presented here will add to our knowledge and understanding of Nuba Mountain languages. Furthermore, in describing and analysing some of the typologically unusual features of Katcha's nominal system, this thesis aims to challenge some standard assumptions about these constructions and contribute to the debate about the language's genetic affiliation.

Of course, data is not described in a vacuum; the general theoretical assumptions held by the researcher — any researcher — frame the questions he or she asks and influence the descriptive analysis. Although I aim to present the morphosyntactic descriptions in a relatively atheoretical way, the general assumptions underlying these descriptions are those of Dynamic Syntax, taking incrementality and dynamic processes seriously. It is to be hoped that adopting such assumptions will yield insights in the morphosyntactic descriptions that might otherwise be missed.

The main aim of the theoretical analyses in part III is to test the suitability of

Dynamic Syntax to model some of the key insights of the descriptive analysis, while also extending and refining the theory where necessary. In testing DS as a model, the main criterion must be the extent to which the theoretical tools provided by DS are sufficient to model the Katcha data. Where it is necessary to make adjustments to those tools, the aim is to improve the theory and make it better suited to real-life language.

The typological and theoretical findings which result from the application of a theoretical framework to new language data naturally have implications for a wider theory of language. Some brief comments on these are made at the end of the study in chapter 11.

Chapter 2

Background

Introduction

This chapter provides relevant background information to contextualise the current study. Section 2.1 gives some demographics, briefly outlining the current situation of Katcha speakers and touching on the impact of this on the language. The following sections then go on to describe the current state of linguistic research on Katcha. The majority of published research relevant to Katcha has been in the area of genetic classification, and this work is discussed in section 2.2. The discussion then moves on to summarize the descriptions and analyses that have been produced for Katcha (and related languages) up to this point. Much of this work is unpublished but has proven to be important to the current study, particularly the archive of materials collected by Roland Stevenson. It will be seen through the discussion of sections 2.2–2.3 that while the genetic affiliation of Katcha and its relatives has been the topic of some vigorous debate, and there has been a moderate level of investigation of phonology, much less work has been carried out in the area of morphosyntax. (Indeed, I am aware of only one published paper on any area of Katcha morphosyntax, and that has only been published since I began the research for this study, namely Gilley (2013).) These sections therefore lay out the context for the current project and lead naturally to a summary of my fieldwork and the novel data this study will contribute (section 2.4). The chapter concludes with some indications as to how the issues discussed are impacted by this thesis.

2.1 Demographic background

The Nuba Mountains are an area of rich ethnic, cultural and linguistic diversity with over 40 languages spoken in an area measuring just 325km by 275km (Schadeberg and Blench 2013). Despite the number of ethnolinguistic groups, the Nuba Mountains form a widely recognised and well delineated geographical and cultural area and ‘the Nuba’ are regularly referred to as a whole, both by themselves and by outsiders. The 2010 census gives a population figure of 1.7 million for the Nuba Mountains, and Schadeberg and Blench suggest ‘we may assume that more than one million of them are more or less active speakers of one of the Nuba Mountain languages’ (Schadeberg and Blench 2013:3). At a finer level of detail than this, accurate up-to-date information on the ethnolinguistic situation in the Nuba Mountains is extremely hard to obtain. With the recommencement of hostilities in 2011, outsiders have been generally unable to enter the region. At the time of writing, the severe political and military instability and insecurity continues, with consequent effects on the population. As a result, many Nuba people have migrated to Khartoum, to elsewhere in Sudan, or to South Sudan, though exact numbers are hard to estimate. According to the UN Refugee Agency, there are ‘over 220,000 Sudanese refugees from the Blue Nile and South Kordofan regions who depend mainly on humanitarian aid for their survival’ (UNHCR 2015) in South Sudan and it may be safely assumed that tens of thousands of that number are from the Nuba Mountains. Reports also suggest that large numbers of people have been displaced within the Nuba Mountains themselves. Naturally, such levels of migration are likely to have knock-on effects on language use. Many Nuba in Khartoum, for example, are likely to use Arabic on a day to day basis more than their mother tongue, and children resident in Khartoum may well be more fluent in Arabic than in any Nuba language. Consequently, all demographic statistics are necessarily estimates or out of date (or both), while statistics for any of the individual languages or ethnic groups are largely non-existent. The most recent estimate for Katcha (dated 2004) is that approximately 30,000 people speak either Katcha or the closely-related Kadugli (Lewis *et al.* 2013).

The Katcha home area is situated on the south-western edge of the Nuba Mountains, 23km south of the state capital, Kadugli. The language is spoken on three hills approximately 5km apart, with three corresponding dialects: *Katcha* (also referred to as *Tulobi*), *Tuna* and *Kafina*. According to Stevenson,

For all practical purposes the language of these three hills is the same, although each hill has its distinct features of vocabulary, idiom and intonation. The dialects of Katcha and Kafina seem more closely related than either is to Tuna, but all three are mutually intelligible (Stevenson 1941:1).

The Katcha speakers I worked with demonstrated an awareness of dialect differences which reflects this statement very closely. They described the same three dialects

and occasionally during fieldwork would point out a difference in pronunciation or vocabulary between their own dialect and one of the others. They insisted that there was no problem with intelligibility and indeed speakers from different dialects are working together on the Katcha Bible translation project. I did not find any evidence of morphosyntactic differences between the three dialects.

2.2 The classification of the Kadu languages

Katcha is a member of the Kadu group of languages, which are spoken in the Nuba Mountains of Southern Kordofan State, Republic of Sudan. Like many minority languages in Africa it is both underdocumented and endangered (Lewis *et al.* (2013) classes Katcha's language status as *6b* (*Threatened*) on the EGIDS scale). Nonetheless, at various points over the last ninety years there has been a variety of research carried out on Katcha and other Kadu languages.

The majority of the published research on the Kadu languages has been in the area of their genetic classification. This research includes attempts to classify internal relationships within the Kadu family, and also attempts to define the external genetic classification of Kadu. The latter in particular has been a source of debate with an ongoing controversy over whether Kadu should be affiliated with Niger-Congo or Nilo-Saharan.

2.2.1 Internal classification

The Kadu language group consists of approximately six to ten languages. The connections between these were first noted in a linguistic survey of the Nuba Mountains by MacDiarmid and MacDiarmid (1931), who referred to the group as *Talodi-Kadugli*, after the two major towns in the area. Since then, the group has been referred to by several different names, generally being named after one or two of the constituent languages (presumably whichever the researcher in question believed to be most important). Thus Greenberg (1950) used the name *Tumtum*, while Stevenson (1956-57) and, following him, Tucker and Bryan (1966) referred to the group as *Kadugli-Krongo*. In an attempt to get away from naming a language family after a single member, Schadeberg (1994) suggested *Kadu*. As well as being an abbreviation of 'Kadugli-Krongo', the word *kadu* or *kado* means 'people' in nearly all of the languages, several of which use this word in their self-name, eg. Krongo: *kaḍu mɔḍi* 'people of home' (Reh 1985). This creative suggestion was met with general approval, and the language family is now known almost universally as *Kadu*.

Which languages and dialects belong in the Kadu family is uncontroversial. It is widely agreed that the languages are clearly related and since the group was defined by MacDiarmid and MacDiarmid (1931), no subsequent scholar has seriously questioned its

membership (Schadeberg and Blench 2013:10). Of course, when languages are so closely related, there is always scope for debate about their internal relationships; surveys differ as to exactly how many languages there are, and which varieties should be relegated to ‘dialect’. At one end of the scale, MacDiarmid and MacDiarmid (1931) treat the entire Kadu group as a single language, made up of some twenty dialects. It is worth noting however that by their definition, ‘In speaking of certain forms of speech as being merely dialects of one language, it is to be understood that this does not mean that these dialects are mutually intelligible’ (MacDiarmid and MacDiarmid 1931:151).

Unlike MacDiarmid and MacDiarmid (1931), two further surveys have been undertaken which *do* attempt to classify the relationships within the Kadu family: Stevenson (1956-57) and Schadeberg (1989, 1994). Table 2.1 shows the Kadu languages as listed by these authors, along with their classification in the most recent edition of *Ethnologue* (Lewis *et al.* 2013).

Stevenson (1956-57:103-107) distinguishes nine languages, which fall into three linguistic (and roughly geographical) divisions. Schadeberg, who is the only scholar since Stevenson to have attempted a general survey of Kadu, states that he finds Stevenson’s data generally ‘very reliable’ (1994:12) and adopts Stevenson’s nine languages, though he uses alternative names for many of them and does not elaborate on whether he considers any to have sub-dialects. The only change Schadeberg (1989) makes to Stevenson’s classification is to move two languages from the Western to the Central group (Schadeberg 1989:73). Schadeberg (1994) makes no mention of Stevenson’s geographical divisions.

A marginally different classification is given in *Ethnologue* (Lewis *et al.* 2013). This lists six languages, each with between two and five dialects. There is no attempt to group the languages further, but the divisions in fact correlate very closely with Stevenson’s. The major difference is that Stevenson’s four Central languages (which include Katcha) are treated in Lewis *et al.* (2013) as dialects of a single language. This is something that Stevenson also considered, noting their mutual intelligibility, but he ultimately concluded that ‘further investigation has detected more differences than a casual comparison might suggest’ (Stevenson 1956-57:104).

2.2.2 External Classification

The first attempt to systematically classify the languages of the Nuba Mountains and relate them to a wider linguistic context was by Meinhof (1916, 1917, 1918) who ‘quite mechanically divided them into those with noun prefixes, which he called pre-Hamitic and those without them, which he named in equally vague fashion, Sudanic’ (Greenberg 1950:389). Meinhof’s classification ‘is not very helpful in today’s perspective’ (Schadeberg 1981:292).

The seminal classification of African languages is, of course, that of Greenberg

Stevenson (1956-57)	Schadeberg (1989, 1994)	Lewis <i>et al.</i> (2013)
WESTERN	WESTERN	
Keiga <i>Keiga</i> <i>Demik</i>	Yegang	Keiga <i>Keiga</i> <i>Demik</i>
	CENTRAL	
Tulishi <i>Tulishi</i> <i>Kamdang</i> <i>Dar El Kabira</i>	Mudo	Tulishi <i>Tulishi</i> <i>Kamdang</i> <i>Dar El Kabira</i>
Kanga <i>Kanga</i> <i>Abu Sinun</i> <i>Chiroro</i>	Kufo	Kanga <i>Kanga</i> <i>Abu Sinun</i> <i>Chiroro-Kursi</i> <i>Kufa-Lima</i> <i>Krongo Abdalla</i>
CENTRAL		
Miri	Miri	Katcha-Kadugli-Miri <i>Katcha</i>
Kadugli	Talla	<i>Kadugli</i>
Katcha	Tolibi	<i>Miri</i>
Tumma <i>Krongo Abdalla</i> <i>Tumma</i> <i>Belanya</i>	Sangalii	<i>Tumma</i> <i>Damba</i>
EASTERN	EASTERN	
Krongo <i>Krongo</i> <i>Fama</i>	Krongo	Krongo <i>Krongo</i> <i>Fama-Teis-Kua</i>
Tumtum <i>Tumtum</i> <i>Talassa</i> <i>Kurondi</i>	Talasa	Tumtum <i>Tumtum</i> <i>Talasa</i> <i>Kurondi</i>

Table 2.1: Three proposed groupings of Kadu languages and dialects

(1950, 1963), who places the Kadu languages along with the neighbouring groups as part of the Kordofanian family, Kordofanian in turn being considered part of Niger-Kordofanian, now known as Niger-Congo. Interestingly, although he concludes that there is sufficient evidence to include Kadu in Kordofanian, Greenberg notes that Kadu ‘shows considerable divergence from the remainder’ (Greenberg 1963:149).

Greenberg’s classification is questioned by Schadeberg (1981) who argues that the

evidence linking Kadu to Niger-Congo is no stronger than that linking it to Nilo-Saharan. Moreover, Schadeberg argues that the links between Kadu and Nilo-Saharan are ‘in no way inferior to those that have been adduced for a number of other language groups’, and therefore tentatively concludes that Kadu ‘may be included in the search for substantial Nilo-Saharan comparisons’ (Schadeberg 1981:304).

Following Schadeberg, most scholars now place Kadu within Nilo-Saharan. Dimmendaal (1987) argues for a Nilo-Saharan affiliation on the basis of morphology, specifically, the tripartite number system and cognate inflectional morphemes; Bender (1996, 2000) does so on the basis of lexical cognates.

Stevenson (1991) presents an extensive list of Kadu morphemes (both grammatical and lexical) with possible Nilo-Saharan cognates. Blench (2006:115fn) has said that this marks a change of opinion for Stevenson, but this seems somewhat unfair given that Stevenson’s (1956-57) classification predates Greenberg’s assignment of Kordofanian to Niger-Congo, and given that Stevenson always recognised Kadu as being quite different from the groups now classed as Kordofanian. Further, it is clear that the aim of Stevenson (1991) is to add data to further the debate; he does not attempt to argue forcefully for or against a given position.

Ehret (2000) is the only serious dissenter, placing Kadu in Niger-Congo on the basis of historical reconstruction, though Blench (2002) heavily criticises his methods.

Blench (2006) argues for a Nilo-Saharan affiliation on the basis of structural evidence such as number, gender, case and derivational morphology. He agrees that there are lexical resemblances to Niger-Congo, but argues that they do not conclusively place Kadu closer to Niger-Congo than to Nilo-Saharan. In fact, Blench goes further; an advocate of a macrophylum uniting Niger-Congo and Nilo-Saharan (Blench 1995), he argues that these lexical connections should be taken as evidence of the existence of “Niger-Saharan” (Blench 2006:114). Interestingly, Ehret (2000:236), though placing Kadu in Niger-Congo, also suggests that the Kadu data lends weight to the idea of a historical connection between Nilo-Saharan and Niger-Congo.

Finally, the most recent work in this area is that of Dimmendaal (2008, 2011), who implicitly acknowledges the lack of consensus by suggesting that the Kadu languages ‘probably constitute an independent family’ (Dimmendaal 2008:850).

Thus, when it comes to the question of whether the Kadu languages should be considered to belong to Niger-Congo or Nilo-Saharan, there are four logical possibilities: that Kadu is Niger-Congo, that it is Nilo-Saharan, that it is both Niger-Congo *and* Nilo-Saharan, or that it is neither. As summarised in Table 2.2, all four possibilities have their advocates.

Kadu’s status has been a matter of such debate because it ‘is clearly quite remote from any of its progenitors and has also borrowed extensively from present and former neighbours’ (Blench 2006:103). It would seem that the relationships between this group

Affiliation	Proposer(s)
Niger-Congo/Kordofanian	Greenberg (1950, 1963) Ehret (2000)
Nilo-Saharan	Schadeberg (1981) Dimmendaal (1987) Bender (1996, 2000) Blench (2006)
Both/‘Niger-Saharan’	Blench (2006) (Ehret (2000))
Neither (Independent Family)	Dimmendaal (2008, 2011)

Table 2.2: Proposed genetic affiliations of the Kadu languages

and other African language families are sufficiently unclear that its status will remain debatable for some time to come.

2.3 Previous Linguistic Descriptions and Analyses

Much less has been published in the way of phonological or morphosyntactic descriptions and analyses of Kadu languages than on their genetic affiliation. This does not mean, however, that no research has been carried out. In fact, there has been a long tradition of documentation of Nuba Mountain languages. Much of this remains unpublished, having been carried out for the purpose of education and literacy development, but it has proved to be invaluable to the present study. The most important figure in this tradition is Roland Stevenson, who worked in the Nuba Mountains for many years starting in the 1930s. More recent research has also been carried out on the Kadu languages. The majority of this more recent work has focused on phonology, with a view to orthography development, but there has been some work in morphosyntax.

2.3.1 Stevenson Archive

Roland C. Stevenson worked as a missionary educator and linguist in Sudan with the Church Missionary Society from 1937, living and working at the mission school in Katcha for twenty one years. He received his PhD in African Languages from SOAS in 1951. In 1958 he moved to Omdurman (Greater Khartoum) where he continued his linguistic work while also teaching social anthropology at the University of Khartoum. In 1965 he was employed by the United Bible Society in Nairobi as Translation Consultant for East Africa and the Middle East, before returning to the University of Khartoum in 1980 where he was became professor and later head of department in the Division of Sudan and African Languages. (Schadeberg 2009; Young Library 2015)

Stevenson's thesis, an overview of Nuba Mountain languages, was published in parts as Stevenson (1956-57) and a very limited amount of his more recent data was also published in Stevenson (1991), though the latter is primarily concerned with vocabulary. Although it is a linguistic overview of the whole region, Stevenson (1956-57) uses Katcha as the main source of examples for the Kadu group, and consequently it contains a fair number of examples of Katcha, along with some analysis. The Kadu data found in Tucker and Bryan (1966) is a more condensed version, primarily based on Stevenson (1956-57), but also on some of Stevenson's unpublished data.

In addition to this relatively small amount of published data, Roland Stevenson collected extensive data on the Nuba languages which has not been published. After his death this material was donated by his family to the linguistic community. The majority is now archived in the Special Collections of the Charles E Young Research Library at UCLA, where it has recently been sorted and recatalogued by Christopher Ehret. The archive extends to some 44 boxes of linguistic and anthropological material, with Katcha being one of the best represented languages in the collection. It therefore represents a substantial resource, albeit one which can only be consulted in person.

The archive includes several boxes of Stevenson's field notes on Katcha (some of which are written on the back of wartime telegrams!). Most of these are lists of words (and some phrases) for elicitation typed in English with Katcha translations filled in in handwriting. Several boxes contain ethnographic write-ups (in English) describing aspects of Katcha life, such as cultural rites, agriculture etc., while others contain examples of Katcha literature, such as reading primers, hymns and prayers. The jewel in the crown of the Katcha collection, however, is a full manuscript grammar of Katcha. This manuscript, referenced in the current study as Stevenson (1941), is 142 pages long. It is typed, with the Katcha data written in red typescript, with some handwritten marginal notes and corrections. It is essentially a 'finished' document, Stevenson having signed the title page and added the year '1941'.¹

Stevenson's manuscript is a remarkable resource. It is naturally somewhat dated in the terminology employed and in the state of the art that was available to Stevenson at the time (for example, there is no discussion of vowels in terms of ATR-type features, which were unknown to researchers at the time). Nonetheless, I have found Stevenson's data to be remarkably accurate in addition to being well organised and well presented. More than once, I had some skepticism toward one of Stevenson's analyses, tested it through fieldwork, eventually to come to the conclusion that Stevenson might well be correct. Schadeberg's comments about the Tira and Otoro manuscripts hold equally for the Katcha manuscript:

In many branches of science, including linguistics, a manuscript that is past

¹This closely matches the description of the Tira and Otoro manuscripts which have been edited by Thilo Schadeberg and published as Stevenson (2009).

the official retirement age of 65 would be of interest only to the history of science. Not so in this case... [This] highlights the talents of Roland Stevenson as a young researcher (Schadeberg 2009).

It is to be hoped that one of the benefits of the current study is to create awareness of Stevenson's work, and to bring to the public domain at least some of his data which otherwise remains relatively inaccessible.

2.3.2 Phonology

In more recent years a number of researchers have worked on the Kadu languages with a focus on phonology. For several years Schadeberg (1994), based on data collected in the mid-1970s, was the primary source of phonological information. However, 'during the 1990s, considerable new work has gone into the phonology of Kadu languages, with a view to the creation of orthographies' (Blench 2006:103). These manuscripts are largely unpublished but they form the basis of an overview of Kadu phonology published by Hall and Hall (2004). A similar overview, with similar findings (which differ somewhat from those of Schadeberg), is given in Dafalla (2006). These three sources form the basis of the phonology sketch presented in chapter 3. All three consider the phonology of the Kadu group as a whole, with little reference to any divergence between the member languages. While their analyses may differ in places, they are all in agreement that the various languages are sufficiently similar for this to be a legitimate approach.

A further point of agreement between the three phonological overviews is that there is a general lack of understanding of tone in Kadu languages. The majority of the published data of Katcha, and on many of the other Kadu languages, ignores tone. Indeed the only paper to attempt any sort of analysis of tonal behaviour in a Kadu language is Hall (2006), for Kamda. For the Katcha-Kadugli-Miri (central Kadu) cluster, the data in Matsushita (1984, 1986) and Gilley (2013) are marked for tone, but the data in both cases are primarily word lists and so contain little indication of tonal processes or of any role tone may play in syntax.

2.3.3 Morphosyntax

Katcha

The only recently published work in Katcha morphosyntax is Gilley (2013). This is a comprehensive study of number-marking in Katcha nouns and is discussed in chapter 4. One other paper which has been made somewhat more widely available is Waag (2012), an (as yet unpublished) conference presentation on Katcha pronouns and case-marking/prepositions which is discussed in chapter 6.

Other than these two papers there is a limited amount of work on Katcha morphosyntax that has been done more recently in Khartoum, mainly in the context of

literacy and language development projects. This primarily consists of write-ups from linguistic workshops held with Katcha speakers in Khartoum between 2006 and 2009, plus transcriptions of several narrative texts recorded in the home area.²

Other Kadu languages

More published data does exist in a few of the other Kadu languages, though none have been studied by more than a couple of scholars. Given that these languages are quite closely related to Katcha, there are insights to be gained from the findings of these researchers.

The most extensively documented of the Kadu languages is Krongo. This is the only language in the family for which a full-length grammar description exists, namely Reh (1985). In addition to this monograph, Reh (1983) summarises in English some of her typologically interesting findings. An alternative analysis of some of the data is found in Dimmendaal's (1987) review.

As well as her larger work on Krongo, Reh has produced a grammar sketch of Keiga, published as Reh (1994).

Krongo and Keiga, then, are arguably the best documented of the Kadu languages. Unfortunately, they are also the most distantly related from Katcha, as per the groupings given in Table 2.1. The only language from Stevenson's 'central' grouping for which data has been published is Kadugli, with two published works: Abdalla (1969) and Matsushita (1984, 1986). The former has the distinction of being the first attempt at theoretical linguistic analysis of any of the Kadu languages. Unfortunately, this renders it somewhat dated; written from the standpoint of early Transformational Grammar, the majority of the content is given to the formulation of transformation rules. It is therefore less useful to the present enterprise than might have been hoped. Matsushita's work is based around vocabulary: after giving an overview of both nominal and verbal morphology, the majority of the articles are taken up by the provision of an extensive word list.

More recent, though unpublished, material on a 'central' Kadu language can be found in Sukkar (2014), a conference presentation on verbal morphology in Miri, which summarizes her MA dissertation.

²I am grateful to Tim Stirtz of SIL South Sudan and to Russell Norton (then of ECS in Khartoum) for providing me with these unpublished write-ups.

2.4 Fieldwork and other data sources

The current study is based on data from the sources discussed above, but also original data collected through fieldwork in Khartoum between November 2012 and May 2013. During this time I worked with two members of the Katcha community in Khartoum. Both were male, aged in their forties and speakers of the Tuna dialect of Katcha. Both men were born and grew up in the language area, speaking Katcha as their mother tongue and in most childhood contexts, though being educated in Arabic from the age of eight. However both had moved to Khartoum at relatively young ages and had lived in Khartoum for many years (24 years in one case, 36 years in the other). Within Khartoum both are active within the expatriate Katcha community and continue to speak Katcha at home and socially. One of the men works as a mechanic and therefore speaks Arabic at work, but the other is employed as a mother tongue literacy worker within the Katcha community and therefore teaches, reads and writes Katcha as well as speaking it most of the time. In addition to Katcha, both men are fluent in Sudanese Arabic and have a reasonable level of English.

My contact with Katcha speakers was largely limited to formal language sessions with my two main contacts. The community were wary of foreigners coming to their neighbourhood due to security concerns, so language sessions were conducted at my house and I did not get much contact with the wider community. Once a week, I sat in on a translation checking session with the Katcha Bible translation team (a further two native speakers) and a translation consultant, though those sessions were conducted in English.

Language sessions, which happened once or twice per week, were a mixture of controlled elicitation and text elicitation. In order to make the most of potentially limited fieldwork time, my controlled elicitation concentrated on morphosyntactic features of the language, eg. agreement paradigms, rather than collecting vocabulary.

The data presented in this study is representative of the morphosyntactic data collected during fieldwork. Audio recordings were made of the majority of it. A list of about 130 nouns in both singular and plural forms was also collected. In addition, three oral texts were recorded, transcribed and analysed using Fieldworks Language Explorer (FLEX) to create a small database of lexical and functional morphemes.

A further resource is the text of the draft Katcha New Testament. The translation group have kindly granted me online reader access to their unpublished draft. The draft is currently under revision, which means it has a tendency to change, and it is translated material so may not necessarily always be in traditional Katcha cultural or literary style, but it nonetheless represents a substantial corpus of textual data and has proven a very helpful source of syntactic examples. An associated resource is the list of verbs found in the text which is maintained by the translation consultant. This

currently lists approximately 470 verbs.

It should be noted that of these various sources of Katcha data, the vast majority are written only. In particular the two largest sources, Stevenson's (1941) grammar and the draft Katcha New Testament are written with no tone and with some inconsistency with regard to the balance between phonetic detail and morphophonemic consistency. (More details are given on these matters in chapter 3.) Throughout this thesis I have therefore tried to use my own data where possible and use examples from the Bible or Stevenson's data only sparingly, or to provide extra discussion for specific hypotheses.

2.5 Conclusion

This chapter has aimed to provide a context for the remainder of the thesis by giving an overview of the demographic background of Katcha, of previous scholarship and of the data on which the thesis is based. It is hoped that the thesis may make some beneficial contribution to all of these areas.

As far as the demographic situation of Katcha is concerned, it would be something of a stretch to expect that a linguistics thesis could make a major contribution toward alleviating the sufferings currently besetting the people of the Nuba Mountains. Nonetheless, it may have some small contribution to make. Like many Nuba groups, there are those within the Katcha community seeking to promote language use and development and to protect their cultural heritage. It is to be hoped that in some small way the current study might be helpful towards that goal.

Similarly, it is not an aim of this thesis to resolve the debate over the genetic affiliation of Kadu. In fact, it has nothing to say at all about cross-linguistic comparisons of morphemes or form/meaning correspondences. However, it certainly does reveal some interesting and unexpected typological findings, such as the gender system discussed in chapter 4. It may well be that some of the morphosyntactic data or typological facts presented here have a contribution to make to the ongoing debate and speculation about Katcha's historical origins.

One thing which *is* an explicit aim of the thesis is to bring to light new Katcha data and thereby to contribute to our understanding of Kadu morphosyntax. This study does not aim to provide a full and comprehensive descriptive grammar of Katcha, not least because Stevenson (1941) has already provided this and has done so generally to a very high standard. But within the focus area of nominals the study presents new data and, it is hoped, provides the benefit of contemporary analytical techniques and theory to further improve our knowledge and understanding. In addition to contributing new data, the synthesis of existing data is a well worthwhile exercise. As noted above, although there has not been a great deal of (recent) morphosyntactic work done in Katcha, there are several distinct data sources, using a variety of different orthographic

conventions. It is hoped that one of the benefits of this research will simply arise from the fact that it brings the various sources of knowledge of Katcha together in one place in a consistent manner.

Chapter 3

Phonology

Introduction

As noted in section 2.3.2, a number of researchers have worked on the phonology of the Kadu languages in recent years. The three main publications in this area are Schadeberg (1994), Hall and Hall (2004) and Dafalla (2006). These three sources all sketch the phonology of Kadu as a group; there are no papers focussing solely on Katcha, but all three authors agree that the nine or so Kadu languages have very similar phonology to one another. This chapter sketches a brief overview of phonology in Katcha, with reference to these studies. Because the available literature refers to the phonology of the entire group, some examples in this chapter come from languages other than Katcha (albeit very closely related, neighbouring languages). However, where relevant I have supplemented this with reference to my own observations during fieldwork.

Sections 3.1–3.4 describe the consonants, vowels and tones of Katcha. Section 3.5 then describes the orthographic conventions I have followed throughout the rest of the study.

3.1 Consonants

3.1.1 Consonant phonemic inventory

(3.1) Kadu Consonant Phonemes

	labial	dental/alveolar	post-alveolar	palatal	velar	glottal
Plosives	p (b)	t̪	t	c (ç)	k	(ʔ)
Implosives	ɓ	ɗ				
Fricatives	f	s				
Nasals	m	n		ɲ	ŋ	
Continuants	w	l r		j		

The following comments can be made about the consonant phonemes of Katcha, listed in (3.1).

Voicing. Voicing is not phonemic. Voiced and voiceless allophones of plosives and fricatives occur throughout Katcha with predictable distribution. This is a highly salient feature of Katcha and also of the other Kadu languages:

For example, plosives and fricatives are voiced between vowels, but are voiceless at the beginning of words (Dafalla 2006:157).

Explosives become voiced in an environment with an adequate level of voicing both preceding and following them. This conditioning operates across word boundaries as well as within words. An environment consisting of nasals and/or vowels always produces voicing... The voicing of fricatives is much more variable between speakers, and is generally less pronounced than for explosives, though occurring most strongly in an environment that includes a nasal (Hall and Hall 2004:3-4).

Questionable phonemes. Hall and Hall (2004) suggest a possible contrast between voiced and voiceless palatal plosives [c] and [j]: ‘In Katcha, Keiga and Miri, the voiceless palatal plosive, *c*, contrasts word initially with the voiced form *j* though *c* has the less frequent occurrence’ (Hall and Hall 2004:4). This was not a contrast I found during fieldwork and consequently in this study all palatal plosives are transcribed as <*c*>. It should be noted though, that Hall and Hall make this suggestion under the heading of ‘Infrequently Occurring Consonants’. They also note that ‘in the other [related] languages *c* does not occur, and *j* is a phoneme.’ Their suggestion of a possible contrast also contradicts their later assertion that ‘Katcha does not have phonemic contrast for voicing between any phonemes’ (Hall and Hall 2005:4). Dafalla and Schadeberg also assume non-contrast across the board.

Contrastingly, I found Katcha speakers to sometimes claim a contrast between /*b*/ and /*p*/ (in addition to /*ɓ*/). It is difficult to know whether this is truly a phonemic contrast; having been educated in English, they were aware that <*b*> and <*p*> are ‘two different letters’. However, this was also true for other voiced/voiceless pairs such as /*t*/ and [d], /*k*/ and [g], etc. which are clearly non-contrastive. I have therefore retained <*b*> in Katcha transcriptions where speakers were insistent, but have generally assumed the phoneme to be /*p*/ elsewhere.

Hall and Hall (2004) do not list the glottal stop as a phoneme of Katcha. It does exist, but is of highly limited distribution, occurring only in the singular forms of the ‘core’ personal pronouns (see chapter 6). This is true throughout the Kadu language family: ‘The status of the glottal stop is rather special. It occurs in the personal pronouns in all nine languages, but it is rare or absent elsewhere in the vocabulary’ (Schadeberg 1994:18).

3.1.2 Consonant clusters and length

Hall and Hall (2004:4) suggest that ‘the range of consonant sequences is restricted...[to] geminates and nasal+non-nasal clusters.’ This is essentially true, although I found some instances where there were possible /r/+stop sequences. These were debatable though; there may have been a vowel in between (Katcha speakers were inconsistent on this point).

In the case of plosives, it is clear that ‘long’ plosives are geminates. They only occur word medially, and as well as length, geminates can be distinguished from single consonants by voicing. Whereas single consonants are phonetically voiced in an intervocalic environment, ‘geminated stops are generally voiceless... Geminated implosives...are neither fully voiced nor fully voiceless. It is my impression that they start as being voiced, and that the vibration of the vocal cords gradually ceases during their articulation’ (Schadeberg 1994:15).

For other consonants, the issue of length is less clear. Consonants may be phonetically longer when they occur at word boundaries, but this is arguably non-phonemic:

Monosyllabic words starting with a fricative s or f regularly lengthen this initial consonant. (The same is also true for nasals, and to a lesser degree also for liquids and glides.)...This lengthening disappears in word (or utterance?) medial position... This lengthening does not appear to be contrastive (Schadeberg 1994:17).

Hall and Hall (2005:5) also point out that consonants appearing in the coda of a syllable can be phonetically longer than those in the onset, but again they stress that this is *not* phonemic.

Long nasals, glides, etc. do occur word medially. Given the behaviour of other consonants, it is likely that these can also be analysed as geminates. However, the distinction is much less clear cut phonetically, so in transcription I have represented these consonants as long, whereas I have represented geminate plosives as doubled.

3.1.3 Word final consonants

A very restricted set of consonants may occur in word final position. They often undergo elision in fluent speech:

Word final consonants tend to be weakly articulated, especially **k**, which is the most widely occurring (Hall and Hall 2004:8).

The velar stop [k]...when it is in final position of words it may disappear in connected speech (Dafalla 2006:157).

3.2 Vowels

3.2.1 Vowel phonemic inventory

There has been some disagreement in the literature regarding the Kadu vowel system. Schadeberg analyses Kadu as having seven distinct vowels:

I consider the vowels **o** and **e** (which occasionally occur in the data) as not distinct from **i** and **u**, respectively [sic]... All vowels appear to be compatible within words; i.e., I have found no evidence of any vowel harmony (Schadeberg 1994:18).

He also points out that Matsushita (1984) for Kadugli and Reh (1985) for Krongo also analysed seven vowel systems.

In contrast, the more recent analyses (Hall and Hall 2004; Dafalla 2006) have suggested a nine/ten vowel system with vowels arranged in two sets ‘based on an articulatory process which is probably similar to the advanced tongue root feature (+ATR) which has been demonstrated for other African languages’ (Hall and Hall 2004:5).

In fact, Katcha does have vowels which can be analysed as belonging to two sets, but there are only eight, as shown in (3.2).

(3.2) Katcha vowel phonemes

[+ATR]		[-ATR]	
i	u	ɪ	ʊ
	o	ɛ	ɔ
		a	

As with many ATR systems, in Katcha ‘the evidence for a contrast between the + and - ATR forms of the central vowel **a** is not conclusive’ (Hall and Hall 2004:5). In addition, there is also a lack of contrast between /e/ and /ɛ/. The latter is a lack of phonemic contrast; phonetically, there is a noticeable distinction, but Katcha speakers do not seem to consider it contrastive. Moreover, Stirtz found that ‘in the approximately 200 verbs and 300 nouns available, there are no roots with the vowel [e] by itself; it only occurs in roots with other [+ATR] vowels’ (Stirtz 2007:2).

It seems that at least within roots there is harmony within the two vowel sets. The salient feature does seem to be something like ATR. The vowels from the set labeled [-ATR] in (3.2) have a slightly more constricted sound, Katcha speakers described them as being more ‘throaty’ than the [+ATR] vowels.

Vowel length is contrastive. All vowels can be long.

3.2.2 Vowel assimilation & Harmony

There is a great deal of movement in vowel quality in Katcha. Vowel assimilation happens frequently, particularly with grammatical morphemes such as number prefixes on vowels occurrence or prepositions. ‘Many affix vowels tend to assimilate to, or towards, the quality of the first vowel of the stem. This can also happen with some words that are treated as prepositions’ (Hall and Hall 2005:5). It is regularly the case that Katcha speakers will spell verbs with one pre-root vowel (usually {a}) while pronouncing them with an entirely different vowel which is clearly assimilating to the verb root.

As noted above, there also appears to be some ATR harmony, but this is not clear-cut and is an area of disagreement between the various authors. The closest statement which matches my observations is that ‘the vowels in any given root all normally being from either the +ATR or -ATR set. Agreement with affix vowels is often difficult to determine’ (Hall and Hall 2004:6).

3.3 Vowel and Consonant Elision

A noticeable feature of Katcha phonology is the large amount of elision that takes place in fluent speech. This is particularly true of vowels, but also happens with consonants. The majority of words, when elicited in isolation, end in a vowel. But spoken in a sentential context, these word-final vowels tend to disappear. Frequently, entire syllables are dropped. ‘A significant amount of elision of vowels and of some consonants occurs in the spoken forms of the languages, between words’ (Hall and Hall 2004:8). This can make it difficult to determine whether certain units are best treated as words or as affixes. It can also make it difficult to assess tone melodies.

3.4 Tone

The majority of research that has been done on Kadu languages, even phonological research, has ignored the issue of tone. ‘All Kadu languages are almost certainly tone languages... but the data are insufficient to analyse the various tonal systems’ (Schadeberg 1994:18). The only published paper with any attempt to analyse tonal behaviour is Hall (2006) for Kamda.

It seems likely that there are two underlying level tones in Katcha. Hall (2006:178-179) states that Mid tone exists phonetically in Kamda, but has some discussion on it and notes some evidence for it being an allotone of High (it only occurs word finally, for example), though its status remains unclear. Schadeberg (1994:18) ‘more or less uncritically assumed a two tone system’ with occasional downstep. He also notes that ‘Falling tones are rare, and rising tones even more so’ (Schadeberg 1994:18). Both

Schadeberg (1994) and Hall and Hall (2004) cite Reh (1985) as describing Krongo as having a two-tone system, and though Schadeberg cites Matsushita (1984) as finding a three-tone system in Kadugli, he points out that Matsushita's Mid tone is rarer than High or Low. In my observation, there are few if any examples of three-way tone contrasts.

There are few lexical items which distinguished solely by tone, though there are some functional words where this is the case. For example, the locative preposition *ká* has high tone, while the dependent clause marker *ka* has low tone.

The main use of tone seems to be grammatical. This seems to be true for Kadu as a whole: '[The] most frequent use of tone and/or stress to distinguish between otherwise similar words is grammatical, differentiating between different forms of the verb' (Hall and Hall 2004:7). In chapter 6 the possibility is discussed that tone distinctions are used to mark case in Katcha, at least on pronouns. Tone is also used to distinguish between certain verb aspects (parallel versus antecedent events), though these fall outwith the scope of the current study.

Hall and Hall (2004) also suggest a possible connection between tone and stress: 'It has also been noted that heightened tone and loudness have a strong tendency to co-occur' (Hall and Hall 2004:7). This is true for Katcha, certainly on a phrasal level. It is my impression that there is usually one syllable per 'intonational domain' which carries a higher tone and is louder than all others. This syllable appears to be the most stressed or focussed within the phrase. I leave open the question of what constitutes an 'intonational domain' and what role the focussed syllable has within it, but in chapter 5 it is noted that this kind of phenomenon seems to be intonational, associated with a pause or with contrast.

Hall (2006:179) observes for Kamda that a 'significant amount of pitch conditioning is evident.' He lists a number of Kamda constructions in which the tones of the noun are changed by the presence of a particular particle or affix. This is also something that occurs in Katcha. Some conditioning is easy to account for, such as the fact that the normally low tone on the first syllable of an oblique pronoun becomes high following the high tone locative preposition (section 6.2.2). Other conditioning is much more complex, so I have attempted to mark the surface form of tone as accurately as possible throughout this study. As noted above though, vowels are frequently elided in Katcha; in these cases I have marked the underlying tone (and indeed, the underlying vowel) where it is known.

3.5 Orthographic conventions used in this study

In general, I have tried to adopt a conservative but morphophonemic transcription, making as few analytical decisions as possible while still maintaining morphophonemic transparency.

Novel data in this study is transcribed using the IPA symbols in (3.1-3.2), with the exception of the dental plosive phoneme, which is transcribed as <t>, and the front mid-height vowel phoneme, which is transcribed as <e>.

High tone is marked with an acute accent <á> and falling tone with a circumflex <â>. Low tone is unmarked. As noted in section 3.4, I have attempted to mark the surface form of tone wherever possible throughout this study. As noted above though, vowels are frequently elided in Katcha; in these cases I have transcribed the underlying tone (and indeed, the underlying vowel) where it is known. Note that where examples are taken from written sources they are transcribed without tone (the source is acknowledged in all such cases).

‘Long’ plosives and implosives are unambiguously geminates and so are transcribed with a double consonant <kk>. Long nasals, glides and vowels are more ambiguous as to their status and so are marked as long <a: > unless they can be clearly analysed as belonging to two separate morphemes, in which case a morpheme boundary is marked <a-a>.

All Katcha and IPA data is set using **Charis SIL** font. When phonemic, phonetic or orthographic forms specifically are being referred to in the text, the appropriate brackets are used and the text is **upright**. In other cases, quoted linguistic forms are written in *italic* without brackets.

Unless specifically illustrating phonetic processes such as final vowel elision, the full citation form of morphemes is given in interlinear examples. For example, the instrumental preposition *ana* is usually realised as [a] before a consonant and [an] before a vowel, but is transcribed as <ana> (with relevant tones) in interlinear morphemic glossing.

Where data examples are taken from written sources, the original orthography is given verbatim and then transliterated to match the above orthographic conventions (without adding tones). In the case of data quoted from Stevenson (1941, 1956-57), he standardly gives a free (though relatively literal) English translation, but does not give morpheme breaks or glosses. When quoting his data, I therefore quote the example verbatim, give my own interlinear morphemic gloss, and give Stevenson’s free translation. Thus in examples such as (3.3), the first and final lines are Stevenson’s, while the intervening lines are mine. Likewise, with examples taken from the draft Katcha New Testament, the text is first given verbatim, then my morphemic gloss, then

an English free translation from one of the English source texts.¹ Thus in examples such as (3.4), the first and final lines are taken from the Katcha and English Bible translations respectively while the intervening lines are mine.

- (3.3) *bibala iyana* *ɛfə*
βɪːbala ija-ana *eːfə*
boy 3M.milk-ANTIP cows
'The boy milks cows, (i.e. he cow-milks in general).'

(Stevenson 1956-57:58)

- (3.4) *a kadu tadhifi co a kürö*
a katu t-aṭifi cə a kuro
SUBJ people INF-drop go DAT outside
'it is thrown out'

(MAT 5.13)

¹The translators work from the New International Version, the New Living Translation and Today's English Version, as well as from two Arabic translations. I quote as a translation whichever of the English versions appears most closely to resemble the Katcha text.

PART II
Morphosyntactic Descriptions

Chapter 4

Number and Gender

Introduction

Katcha has an interaction between the categories of Number and Gender which is typologically unusual. It is also relevant to the wider debate about the genetic affiliation of the Kadu family because the number and gender systems display properties reminiscent of both Niger-Congo and Nilo-Saharan languages. The interaction between number and gender also shows properties which are very rare, but which have been argued to exist in certain Afro-Asiatic languages. This is something of a surprise; with the partial exception of Blench (2006), no previous research has suggested a relationship between Kadu and the Afro-Asiatic phylum. Whilst typological similarities alone do not constitute definitive proof that a language belongs to a particular phylum, they certainly should be considered seriously. The existence of shared typological phenomena in two languages may be evidence of a diachronic connection (Bickel 2007, 2011). In any case, it is notable that the phenomena described in this chapter reflect the general state of confusion over the lineage of Katcha. Given the complexity of the data, it is not surprising that different researchers have interpreted them differently. There is a general correlation between the way the morphosyntactic facts have been interpreted and the assumptions about the language's genetic affiliation prevalent at the time. Thus, following Greenberg's (1950) classification of the Kadu languages as Kordofanian, older studies of Katcha (Stevenson 1956-57; Tucker and Bryan 1966) attempted to demonstrate Niger-Congo-style semantically based noun classes based on the number prefixes. Following Schadeberg's (1981) questioning of this assumption, more recent work (Dimmendaal 2000; Gilley 2013) has sought to demonstrate that Katcha displays a tripartite system more typical of Nilo-Saharan. This chapter will demonstrate that there are elements of both of these systems present in the Katcha number system, before going on to demonstrate that certain features of the gender system, such as the notion of 'polarity' and its interaction with number, are more similar to those found in

Afro-Asiatic.

The chapter begins with a discussion of number marking in section 4.1. Number is marked on Katcha nouns by a variety of plurative and singulative affixes. A very welcome recent development in this area has been the publication of Leoma Gilley's paper on noun morphology in Katcha (Gilley 2013). This is a comprehensive and systematic presentation of data on Katcha nouns, focusing on the number-marking affixes. Gilley's data, which was collected from Katcha speakers in Khartoum in 2006–2007, matches my own quite closely. In section 4.1 below, I therefore present some representative nouns of each type and mention where my data diverges from Gilley's, but for further examples the interested reader may refer to Gilley's paper.

The gender system is then described in section 4.2. The main focus of this section is to establish the number of gender classes in Katcha; there are three classes of agreement in Katcha but previous work has been inconsistent as to whether these represent three gender values, or only two genders plus plural number agreement. The argument is made that there are three values of gender. It is demonstrated that these are semantically based on biological gender and so they are described – temporarily – as *masculine*, *feminine* and *neuter*.

Having described number marking and gender classification, the discussion moves on to the interaction between these two categories. There are two senses in which number and gender interact in Katcha. Firstly, there is a relationship between the number-marking prefix and the gender of the noun. This is discussed in section 4.3 where it is shown that (for morphologically number-marked nouns) the affix, rather than the noun root, assigns gender to the noun. This can result in 'gender polarity' where the gender of the noun changes when its number changes. Secondly, there is an intimate connection between the third gender class and the concept of plurality. This is discussed in section 4.4. It is argued that rather than *neuter*, the semantic basis of the third gender category might be better described as *plural*.¹ The incorporation of plural as a value of the gender system is a phenomenon that has been described (and argued about) in the literature on Cushitic, but has to my knowledge never before been recorded outwith that language family.

The place of this chapter within the study as a whole is largely to provide background information. The focus in this chapter is primarily morphological: to establish the number and nature of gender classes. An understanding of the gender system, and to a lesser extent the number system, is foundational to understanding Katcha nominals. However, it is not the main focus of the descriptive and theoretical analyses in the rest of the thesis, which focus on syntax and semantics. I assume that phonology and morphology play a part in establishing the input to syntax, but I am relaxed about

¹Sets may also be thought of as neuter, at least in terms of natural gender distinctions, but plurality is the more important feature in Katcha.

exactly how this is done. Where there is no evidence to the contrary, my default is to assume a transparent analytic morphology for multimorphemic words on the basis that this best satisfies Occam's razor.² For this reason the descriptive analyses in part II largely focus on establishing the function of individual morphemes and the theoretical analyses in part III on defining their formal semantics. I assume that evidence in favour of taking an alternative, more lexical position in any particular case will largely come from morphophonology (Kaye 1989, 1995). Since this study has little to say on phonology, I remain open minded about the best morphological analysis in any given instance and in places I consider analyses based on an alternative morphological characterisation.^{3,4}

4.1 Number

Number is marked on Katcha nouns by plurative and singulative affixes. Most of these are prefixes, and they are relatively numerous. In some cases, singulative and plurative prefixes occur in pairs, and in a subset of these, it is possible to see a semantic connection between the nouns they inflect. In this way, Katcha nouns superficially resemble Kordofanian nouns with their noun-class prefixes and Stevenson (1941, 1956-57) frames his presentation of nouns in these terms. Stevenson does note two important caveats: firstly, that the agreement system in Katcha is quite different to those found in the Kordofanian languages (this is discussed in section 4.2), and secondly, that 'most of the noun classes possess either a singular or a plural prefix, but not both' (Stevenson 1941:26).

More recent work (Dimmendaal 2000; Gilley 2013) has argued that Katcha displays a system more typical of Nilo-Saharan nouns: a tripartite system consisting of 'singulative marking, plural marking, and a replacement pattern' (Dimmendaal 2000:214). That is to say, there are nouns whose plural form is unmarked and whose singular is marked morphologically; there are nouns where the unmarked form is the singular and it is the plural form which is morphologically marked; finally, there are nouns where both singular and plural carry morphological inflection. Diverging from Dimmendaal's terminology slightly, I refer to morphology of the first type as *singulative*, to the second type as *plurative* and to the third type as *replacive*. To avoid ambiguity, when referring to the number of the referent, I use the terms *semantically singular* or *semantically plural*.

²We need a syntax to combine linguistic units anyway, so all things being equal we may as well use it rather than have a separate set of morphological operations.

³For example, see the discussion in section 9.5 of whether verbs carrying an applicative suffix should be analysed as lexical items or analytically.

⁴The approach to morphology summarized here is in line with the general assumptions of Dynamic Syntax. DS takes linguistic formatives as projecting semantic instructions to the computation, but is not exercised about whether those formatives are words or morphemes.

Gilley's (2013) choice of presentation method is particularly interesting with regard to the Niger-Congo/Nilo-Saharan debate. She follows Dimmendaal (2000) in arguing quite strongly that Katcha does indeed follow a Nilo-Saharan-style tripartite number marking system, but at the same time groups nouns into classes according to their singulative/plurative-affix pairs (allowing for one member of the pair to be zero-marked). She therefore follows Stevenson in suggesting that there is a \emptyset -/*nV*- class, a \emptyset -/*kV*- class, a *t*-/ \emptyset - class, etc.

In this section, the organization of the data focuses on the individual affixes rather than on any patterns that can be drawn from their pairings. This is because, as will be seen below, there is a fair amount of 'mix-and-matching' when it comes to the replacive nouns (those inflecting with both a singulative and a plurative prefix). Also, it will be shown in section 4.3 that it is the individual affixes which are relevant to agreement in Katcha, and not the affix-pair 'classes'. The plurative affixes are introduced first, followed by the singulative affixes and then the replacive affixes.

4.1.1 Plurative Affixes

Plurative prefix *nV*-

The most common, and also most productive, plurative affix is the prefix *nV*-, where the prefix vowel is a copy of the first vowel of the root. Some examples are listed in (4.1).

(4.1)	Unmarked form (semantically singular)	Affixed form (semantically plural)	Gloss
a.	kisíríndí	ni-kisíríndí	k.o. musical instrument
b.	ǰónô	no-ǰónô	necklace bead
c.	kerdé	ne-kerdé	calabash plate
d.	pórró	nɔ-pórró	k.o.bird
e.	ǰɔɔǰɔɔ	nɔ-ǰɔɔǰɔɔ	k.o. spear
f.	ɓuttúlú	nũ-ɓúttúlú	ground
g.	ɓuttúndû	nu-ɓuttúndû (Speaker 1) nú-ɓuttúndû (Speaker 2)	dragonfly
h.	lamă:cá	nă-lamă:ca	grinding room
i.	ɓaca	nă-ɓácâ	scorpion
j.	kɔɔ	nǎ:kólǎ	eagle
k.	murú	nũ-múrú	rabbit
l.	urũ:nú	nuk-urũ:nú	year, era
m.	teré	neke-teré	moon
n.	karakanta	nak-kárakânta	mushroom
o.	ú:tú	nuŋk-ú:tú	head

It can be seen in (4.1) that there are different variants of the *nV*- prefix. In examples (a–d), the prefix has a low tone and there is no effect on the pronunciation of the noun stem; in examples (e–g), the tone pattern changes on the stem, and the tone of the prefix is not always low (and in the case of (g) is inconsistent between my two language speakers). In examples (h–k), the prefix vowel is long, with a rising tone; there is no effect on the tone of the stem in (h), but the tones change in a consistent manner in the case of the bisyllabic stems (i–k). In examples (l–o), the prefix includes a /k/ after the /nV/, and the the tone of the prefix vowel is low in all these examples (in the case of (m) an epenthetic vowel is inserted between the /k/ of the prefix and the initial consonant of the stem, this extra vowel also carries low tone). The only one of the /nVk/ examples to show any tonal change in the stem is (n) *karakanta* – however it may be that this is better thought of as beginning with an underlying /k:/ (there being no phonetic distinction between long and short consonants word-initially), in which case the prefix would be /nV/ and it should be listed with examples (e–g). Example (o) also has a nasal within the prefix. This is the only example of this kind that has been found so far.

It may be that further analysis of the morphophonology of Katcha nouns would provide explanations for these variations, or alternatively lead to the conclusion that the examples given here represent more underlying prefixes. Gilley (2013) separates

them into three basic groups: *nV*-, *ná:-/nV:-* and *nVk*-. However, for current purposes it is convenient to consider them all together.

Plurative prefix *kV*-

A second, relatively common, plural affix is the prefix /*kV*-/, where the prefix vowel is a copy of the first vowel of the root. Some examples are listed in (4.2).

(4.2)	Unmarked form (semantically singular)	Affixed form (semantically plural)	Gloss
a.	ʈɪŋʈĩ	kɪ-ʈɪŋʈĩ	bell
b.	ʈaŋká	ka-ʈaŋká	butterfly
c.	mɔŋŋɔ	kɔ-mɔŋŋɔ	elephant
d.	te:fe	ke-té:fê	friend
e.	ʈɪmbi	ki-ʈɪmbî	rooster
f.	ambâ	kab-ábâ	drum
g.	sɔɔ	kɪsɪn-sórɔ	blind person

Again, there are variations here. In examples (a–e) the prefix is /*kV*/ with low tone. In (a–c) there is no change in the tones of the noun stem, while in (d–e) the stem tone changes. In (f) there is a /*b*/ included in the prefix. This is the only example of this kind that has been found so far. It may be simply because the stem begins with a vowel, though more examples would be needed to confirm this. Example (g) should probably be listed separately: there are no other examples of this prefix, and it is hard to imagine that it is actually derived from /*kV*/, so it should probably be considered as a unique irregular prefix.

Plurative suffix *-mí*

Although Katcha marks number on nouns using prefixes almost exclusively, there is a small group of nouns which appears to form its plural using a suffix, *-mí*. This has been a puzzle for previous researchers: Gilley (2013:518) wonders whether there may be some other function for this morpheme, though there is no clear indication as to what this might be. The possibility that *-mí* might have some other function is supported by the fact that, according to Gilley's data, this suffix sometimes occurs on nouns which also take a plurative prefix. On the other hand, (4.3) gives some examples where *-mí* appears to be the only marker of semantic number. In these cases at least, it looks as if it may be that *-mí* is simply a marker of plural for a small, closed set of nouns.

(4.3)	Unmarked form (semantically singular)	Affixed form (semantically plural)	Gloss
a.	kɪbé	kɪbí-íní	goat
b.	kʊɓa	kʊɓʊ-íní	bone
c.	tɪra	tɪ-íní	dog

The effect of the suffix on the shape of the stem appears to vary between the examples, with a vowel change in (a) and (b), and apparent elision of a stem consonant and vowel in (c). However, it seems safe to assume that these few nouns are all taking the same morpheme as their suffix.

Plurative prefix *mV-*

(4.4) shows a small class of nouns whose plurals are formed by the addition of the prefix *mV-*.

(4.4)	Unmarked form (semantically singular)	Affixed form (semantically plural)	Gloss
a.	kanɕá	ma-kanɕá	k.o. spear
b.	kǔ:fi	mʊ-kú:fi	stick
c.	kʊlʊɓá	mʊ-kʊlʊɓá	knife
d.	kúɓɓô	mʊ-kúɓɓô	spoon

4.1.2 Singulative Affixes

The second major grouping of nouns are those whose unmarked form is plural and which form their singular by the addition of a prefix. As is common in Nilo-Saharan tripartite number-marking systems, nouns with singulative marking tend to be uncountable, mass or collective nouns or those which are typically found in large numbers. In the case of mass nouns, the singulative form may mean “a piece of”, “a drop of” etc.

Singulative prefix *t-*

The most common, and most productive, singulative affix is the prefix *t-*. Some examples are given in (4.5).

(4.5)	Affixed form (semantically singular)	Unmarked form (semantically plural)	Gloss
a.	tu-kupúppú	kupúppú	k.o. tree
b.	t-ukulumǫ́	ukulumǫ́	wild gourd
c.	te-mereké	mereké	sesame
d.	ta-ma:ka	ma:ka	glue
e.	t-ɔ̀nɔ̀kɔ̀	anɔ̀kɔ̀	heart, breast
f.	t-irippi	irippi	ball
g.	tiŋ-kisi	kisi	bead
h.	tɔ̀ŋ-kɔ̀ŋɔ̀	kɔ̀ŋɔ̀	perfume
i.	tɔ̀n:ɔ̀lɔ̀	ɔ̀lɔ̀	fodder

There are a couple of variations of the *t*-singulative prefix, but it seems safe to assume that these are all versions of the same basic morpheme. It seems clear that in examples (a–f), the prefix is /t/ before a vowel and /tV/ before a consonant. Where a vowel is inserted it has a low tone; in both cases the addition of the prefix has no effect on the tones of the stem. In (g–i) the prefix appears to include a nasal, short in (g) and (h), long in (i). Gilley (2013:512) observes that there is a correlation between the presence of the nasal and non-countability, ie. count nouns tend to take singulative *t*- while mass nouns take singulative *tVN*-. She does also note some counterexamples, however.

Singulative prefix *nt*-/*ns*

A second singulative prefix is *nt*- or *ns*-. Gilley (2013:512) suggests that the underlying form of this morpheme is /nt/ with /ns/ a variant occurring before some front vowels. Some examples are given in (4.6).

(4.6)	Affixed form (semantically singular)	Unmarked form (semantically plural)	Gloss
a.	nt-oké	oké	guinea fowl
b.	ns-ekete	ekete	wing
c.	ns-ikilí	ikilí	belt
d.	n-to:jo	to:jo	seed
e.	ntin-is:í	is:í	gun
f.	ntɔ̀n:ɔ̀jɔ̀	ɔ̀jɔ̀	grass

Again, there are some differences visible here, but following Gilley, I assume these to be variations of the same prefix. Examples (a–c) form the singular using the prefix /nt/ or its variant /ns/. Since there is no other example of /n/ occurring as a singulative prefix, (d) may be assumed to be an example of this same prefix with the /t/ of the prefix

elided before the initial /t/ of the root. As with some of the examples in (4.5), (e) and (f) include a nasal, apparently as part of the prefix; again, this may be associated with uncountable objects.⁵ Where the prefix contains a vowel, it is consistently low tone; in all cases the prefix has no apparent effect on the shape of the stem.

Singulative prefix *ḡ-*

(4.7) shows a small class of nouns whose singulars are formed by the addition of the prefix *ḡ-*.

(4.7)	Affixed form (semantically singular)	Unmarked form (semantically plural)	Gloss
a.	ḡI-kirĩ:sí	kirĩ:sí	tick
b.	ḡ-ó:	ó:	bear
c.	ḡ-elétté	elétté	bat
d.	ḡ-ǎ:já	ǎ:já	wild cat

These are clearly all examples of the same prefix. Only (a) varies in any way, with the insertion of an epenthetic vowel before the consonant of the stem. As seems to be usual, the inserted vowel is a copy of the first vowel of the stem and carries low tone. Adding the prefix has no effect on the tones of the stem.

Other Singulative prefixes

A very few nouns in Katcha form their singulars by the addition of a consonant other than /t/ or /ḡ/ (4.8a–c), while (4.8d) is one noun with an apparently unique irregular prefix.

(4.8)	Affixed form (semantically singular)	Unmarked form (semantically plural)	Gloss
a.	f-ɔ̀rɔ̀kɔ̀	ɔ̀rɔ̀kɔ̀	leather
b.	f-ereké	ereké	k.o. tree
c.	p-erembé:ré	erembé:ré	stringed instrument
d.	mutu-kule:lé	kule:lé	shell

Gilley (2013:511) includes /f/ and /p/ as variations of the *t-* prefix, and also gives one example with a *c-* singulative prefix. Stevenson (1941:30) includes /f/ as a variation of *ḡ-*, which has in its favour the fact that both are labials, to which /p/ might also be

⁵The primary meaning of *is:f* (4.6e) is ‘fire’, by semantic extension the singulative of this word has come to mean ‘gun’.

added. For now, I assume that this list represents three different prefixes (*f*-, *p*- and *mutu*-). There are too few examples to be able to draw any firm conclusions.

4.1.3 Replacive Affixes

In Nilo-Saharan languages, there is commonly a third type of noun. This is the type with replacive marking, where both semantically singular and semantically plural forms of a noun are marked by an affix. These are the nouns which most closely resemble those found in Kordofanian languages. If there is any evidence to be found of Niger-Congo-type semantically-based noun-classes, it is likely to be found among these nouns, and in fact, there is some evidence of limited semantic classification. Replacive nouns are not as common in Katcha as those which mark only plurative or singulative, but there are enough of them to be able to make some observations.

Replacive prefixes *t*-/*k*-

List (4.9) shows a class of nouns with a clear semantic basis, referring only to humans (strictly speaking, to intelligent, personal beings, since the non-human ‘angel’ is also in this set). These nouns take the singulative prefix *t*- and the plurative prefix *k*-. As can be seen in (4.9), the distinguishing morphological feature of nouns in this class is that they also have a separate feminine singular form derived by the addition of the pre-prefix *ma*-. This morpheme does not routinely get prefixed to other nouns, even where a male-female distinction might be semantically relevant (eg. domestic animals). This group of nouns therefore represents something of a special case.

(4.9)	Masculine singular form	Feminine singular form	Plural form	Gloss
a.	t-atalá:ná	ma-t-atalá:ná	k-atalá:ná	teacher
b.	t-atarada:na	ma-t-adarada:na	k-atarada:na	tailor
c.	t-aʦaŋká	<i>unattested</i>	k-aʦaŋká	angel
d.	ta-amasála ⁶	ma-t-amasála	k-amasála	priest

⁶It is unclear why the initial /a/ is lengthened in this example.

Replacive prefixes *s-*/*aŋ-*

Stevenson (1941:30) gives the pairing of *s-* (singular) and *aŋ-* (plural) as a semantic class referring to containers, though he says it is a small class and “tending to disappear” with *nV-* being used in the plural instead of *aŋ-*. Checking Stevenson’s list with Katcha speakers, they only recognised or agreed with two of the nouns (4.10a–b). A further example which may be related to these is (4.10c). In the latter case, the plurative prefix is again *aŋ-*, but the singulative prefix is *ns-*.

(4.10)	Semantically singular form	Semantically plural form	Gloss
a.	<i>s-é:ǰé</i>	<i>aŋ-é:ǰé</i>	water pot
b.	<i>s-ɔ:ró</i>	<i>aŋ-ɔ:ró</i>	grain basket
c.	<i>ns-e:ra</i>	<i>aŋ-e:ra</i>	fence

There are two comments to make concerning these nouns. The first is that *both s-* and *aŋ-* are rare morphemes. Neither occur with any nouns other than those given in (4.10). Most notably, there are no (non-replacive) singulative nouns which take *s-* as the singulative prefix, and no (non-replacive) plurative nouns which take *aŋ-* as their plurative prefix. As discussed below, this is unusual.

Secondly, it would seem likely the *s-* and *aŋ-* prefixes are indeed in the process of disappearing from the language. Besides Stevenson’s comment that plural *aŋ-* is being replaced by *nV-*, (4.10c) may be an indication that singulative *s-* is also disappearing and being replaced by *ns-*. Of course, this is speculation based on only one lexical item, but it is certainly plausible.

Replacive marking using existing plurative/singulative prefixes

In the vast majority of cases, Katcha nouns with replacive number-marking use some combination of the plurative and singulative affixes seen in sections 4.1.1 and 4.1.2. The list in (4.11) gives some examples of replacive nouns. (This list is ordered by plurative prefix.)

(4.11)	Semantically singular form	Semantically plural form	Gloss
a.	m-úsólá:ká	k-úsólá:ká	finger nail, claw
b.	m-utókê:de	k-utókê:de	hoof
c.	m-ɔ̄ɲkó:ró	k-ɪɲkó:ró	elbow
d.	nt-ɔ̄lɔntɔ	k-ɔ̄lɔntɔ	feather
e.	t-ɔ̄mmba	kub-úmmbá	cave
f.	n-tí:do	mi-tí:do	k.o. tree
g.	n-tíjje	mi-tíjje	k.o. tree
h.	ntun-u:fé	m-ú:fé	k.o. tree
i.	ɲ-kɪle	mi-kɪle	sorghum
j.	m-í:te	nik-í:te	ox
k.	m-ottó	nok-ottó	horse
l.	m-iri	nikíjɲk-írí	deaf person
m.	mɔ̄-ɔ̄rɔ	nikíjɲk-órɔ	nose

All of the plurative prefixes in (4.11) also occur in the lists in section 4.1.1 (lists 4.1–4.4). In other words, all prefixes on semantically plural replacive nouns also occur as prefixes on plurative nouns. The only exception is *ɲn-*, which as noted above is very rare and probably in the process of disappearing.

Something very similar can be said for the semantically singular forms. The majority of the singulative prefixes in (4.11) also occur in the lists in section 4.1.2 (lists 4.5–4.7). In other words, almost all prefixes on semantically singular replacive nouns also occur as prefixes on singulative nouns. The singulative prefix *s-* is an exception, but it is very rare and possibly in the process of disappearing.

The only singulative prefix in (4.11) which was not mentioned in section 4.1.2 is *m-*. This stands as the only affix which occurs relatively commonly in replacive nouns but does not also occur as a singulative or plurative prefix in isolation. As noted for the ‘human’ noun-class above (and as discussed in more detail in sections 4.2 and 4.3), /*m*/ is a marker of feminine gender, so it is possible that singulative *m-* is derived from the reanalysis of a gender marker. Such a reanalysis would be most likely to occur on nouns which did not already have a singulative marker, i.e. plurative nouns, turning them into replacive nouns.

The nouns in (4.11) do offer some indications that there may be more generalisations to be drawn with regard to particular pairs of prefixes and semantic groupings. For example, (a–c) all take singulative *m-* and plurative *k-* and all refer to certain types of body parts (Gilley (2013:514) suggests ‘appendages’), while (f–h) all take singulative *nt-* and plurative *mV-* and all refer to types of trees. Nevertheless, it is not clear that the replacive prefixes should be thought of as occurring in pairs generally, as would

be expected in a Niger-Congo noun class system. There seems to be a good deal of ‘mix-and-matching’ (though some combinations are more common than others). For example, singulative *m-* occurs with plurative *nVk-* and also with plurative *k-*, while plurative *k-* occurs with singulative *t-*, *nt-* and *m-*. It is probably best to think of number prefixes in Katcha as a set of singulative prefixes and a set of plurative suffixes, with some nouns being inflected by both.

To Tucker and Bryan (1966:11), ‘the multiplicity of Singular and Plural Affixes gives the impression of a Class system long since broken down.’ The case of *s-/aŋ-*, a fixed pair of number-marking prefixes apparently in the process of being replaced by more productive singulative and plurative prefixes, might be an example of this. It should be noted though that Schadeberg (1981:304) contends that the absence of a noun class system in Kadu ‘cannot easily be explained as a loss’.

Relatively few nouns display replacive morphology, so it is difficult to make strong generalisations. Nonetheless, the fact that the vast majority of the replacive prefixes occur as plurative or singulative prefixes in non-replacive contexts and the fact that the replacive prefixes do not seem to be limited to specific pair combinations both suggest that replacive-marking nouns should not be thought of as a separate category of noun. Replacive nouns are simply nouns which happen to mark both number values morphologically rather than only one.

4.1.4 Summary

Number marking on Katcha nouns shows an interesting mix of typically Niger-Congo and typically Nilo-Saharan attributes. There are some instances where there appears to be a correlation between the number prefixes which inflect a noun and its semantics, though in one case (the ‘human’ class) the nouns show atypical morphology with gender marking in addition to the number prefixes, and in at least one case (the ‘containers’ class) the prefixes appear to be in the process of being replaced. All nouns which show any correlation between number inflection and semantics are replacive, where both the semantically singular and semantically plural forms are morphologically marked. To this extent, Katcha does show some evidence of morphologically signalled semantic noun ‘classes’. But although these replacive nouns may superficially resemble a Kordofanian/Niger-Congo noun-class system, overall they are probably better thought of as words which happen to carry both singulative and plurative markers.

The majority of words in Katcha are marked in only one number. Although Stevenson (1941, 1956-57), Tucker and Bryan (1966) and even to some extent Gilley (2013) treat $\emptyset-$ as a prefix participating in pairs of class-defining prefixes, this adds unwarranted complication, generating a large number of internally disparate ‘classes’. The overall number marking system is better thought of as a Nilo-Saharan-style tripartite one, as argued by Dimmendaal (2000) and Gilley (2013). Prefixes are either singulative

or pluralive; some nouns take pluralive prefixes, some take singulative prefixes and some take both. However, within this overall Nilo-Saharan-style system, the replacive nouns show some evidence of morphologically indicated and semantically based noun classes, which might be thought of as like those found in Niger-Congo. Importantly though, these ‘classes’ do *not* trigger gender agreement. The Katcha gender system is quite different and is the subject of the remainder of this chapter.

4.2 Gender

Gender agreement is a key feature of the Katcha noun phrase.

Personal pronouns show gender overtly but, with the exception of the ‘human class’ (4.9), gender is not marked directly on nouns. The gender of nouns is shown instead by agreement markers on noun phrase modifiers (possessors, relative clauses, demonstratives and attributive ‘adjectives’) and on verbs (subject agreement markers). There are three possible agreement markers in each context, given in table 4.1, but previous work on Katcha has been inconsistent as to the number of gender classes. Stevenson (1941, 1956-57) aims to provide only a description of the data and does not name the classes. He describes the agreement patterns and thereafter refers to the relevant nouns as being ‘nouns of the first/second/third type’. Nonetheless, his description makes it clear that he perceives the three concord markers as agreeing with three gender classes. On the basis of this data, Tucker and Bryan (1966) analyse Katcha as having three genders, which they name Masculine, Feminine and Neuter. More recently, however, Waag (2012) works on the assumption that Katcha nouns are divided into two singular gender classes and that the third concord marker reflects plural number, though it should be noted that a systematic study of gender lies outwith the scope of her paper, which focuses on pronouns. The questionable status of the third class is exemplified by Gilley (2013:502) who states that ‘Each word is either masculine, feminine or neuter/plural.’ Again, a study of gender is not the focus of Gilley’s paper and she does not therefore enter into any discussion of what is meant by ‘neuter/plural’ but the implication is that there is a some degree of ambiguity here. Before going on to look at how number and gender interact, it is therefore important to establish how many gender classes there are and whether the third concord marker indicates plural number or a third gender.

In fact, there is little doubt that Katcha has an agreement system of three gender classes, and not a system of two genders plus plural. Moreover, ‘Masculine’ and ‘Feminine’ are good names for the first two classes since animate males are always Masculine (4.12) and animate females are always Feminine (4.13). In many cases, an animate noun may fall into either class according to the sex of the individual referred to (4.14)-(4.15):

	Masculine	Feminine	'Neuter' (Tucker and Bryan 1966) 'Plural' (Waag 2012) 'Neuter/Plural' (Gilley 2013)
attributive (noun phrase modifiers)	j-	m-	n-
predicative (subject agreement markers)	∅	m-	k-
Personal pronouns	ɪŋ	ɔ:kɔ	e:ke

Table 4.1: Gender agreement markers

(4.12) $\eta k \acute{o} : d \acute{o} \text{ } \mathbf{j \acute{a}} \text{ } k \acute{o} k k \acute{o}$
 boar **m.POSS** Kuku
 Kuku's boar

(4.13) $k \acute{o} : k \acute{o} r \acute{o} \text{ } \mathbf{m \acute{a}} \text{ } k \acute{o} k k \acute{o}$
 hen **f.POSS** Kuku
 Kuku's hen

(4.14) $l \acute{i} \text{ } \mathbf{j \acute{a}} \text{ } k \acute{o} k k \acute{o}$
 buffalo **m.POSS** Kuku
 Kuku's (male) buffalo

(4.15) $l \acute{i} \text{ } \mathbf{m \acute{a}} \text{ } k \acute{o} k k \acute{o}$
 buffalo **f.POSS** Kuku
 Kuku's (female) buffalo

Inanimate nouns may belong to any of the three classes, irrespective of whether the noun is semantically singular (4.16)-(4.18) or semantically plural (4.19)-(4.21). For this reason, the third class will be referred to as 'Neuter' throughout the remainder of this section. This choice of terminology reflects the fact that this third class is a gender class, though it will be seen in section 4.4 that the situation is considerably more complex than this.

(4.16) $k a r a k a n \acute{t} a \text{ } \mathbf{j \acute{a}} \text{ } k \acute{o} k k \acute{o}$
 mushroom **m.POSS** Kuku
 Kuku's mushroom

- (4.17) **ambâ má kókkô**
 drum f.POSS Kuku
 Kuku's drum
- (4.18) **kanťá ná kókkô**
 spear n.POSS Kuku
 Kuku's spear
- (4.19) **irippi já kókkô**
 balls m.POSS Kuku
 Kuku's balls
- (4.20) **to:jo má kókkô**
 seeds f.POSS Kuku
 Kuku's seeds
- (4.21) **kisi ná kókkô**
 beads n.POSS Kuku
 Kuku's beads

Uncountable nouns can also belong to any of the three classes, providing more good evidence that Katcha agreement is based on three gender classes rather than two genders plus plural number. Uncountable nouns carry no number prefixes; neither semantic number nor morphological number are relevant here. Yet there are nouns from all three of the gender classes in this group, as shown in (4.22).

(4.22)	Noun	Gender	Gloss
	ǃî:ti	Masc	water
	tulu:kû	Masc	heavy cloud
	ǃujú	Fem	diarrhea
	tíkí:tí	Fem	yeast
	ísî	Neuter	fire
	tambaká:râ	Neuter	white cloud, snow

On the basis of the data presented so far, there is little doubt that Katcha has three genders and that semantic number is not relevant to agreement. This conclusion concurs with the findings of a number of previous researchers on Kadu languages. Reh, for example, describes Krongo as having ‘weitgehend numerus-insensitiven Genera’

(Reh 1985:126), while Tucker and Bryan state that ‘the Gender system cuts across Number’ (Tucker and Bryan 1966:304). However, as noted above, other writers have taken gender in Katcha to be a system of two gender classes, plus plural agreement (Waag 2012) or have been non-committal in whether the third class marks neuter gender or plural number (Gilley 2013). The source of this confusion lies in the fact that Katcha nouns display a complex interaction between number and gender, which is discussed in the following two sections. In section 4.3, it is demonstrated that many Katcha nouns exhibit gender polarity, changing gender when they change number. Thus a change in number is often accompanied by a change in (gender) agreement. Moreover, in section 4.4, it is argued that the value of the third gender class in Katcha is *plural*. The confusion about whether the third agreement class represents a gender or plural is due to the fact that plural *is* a gender.

4.3 Number marking and gender

It was demonstrated in section 4.2 that nominal agreement in Katcha is based on three gender classes and that semantic number is not relevant to agreement. However, this is only half the story. The nouns presented in (4.12)-(4.21), some semantically singular and some semantically plural, and the uncountable nouns presented in (4.22) are all morphologically unmarked for number. In such cases there is no apparent correlation between number and gender; the gender of any given noun is indeed insensitive to its number. However, when a noun carries morphological number marking, whether singulative or plurative, the number-marking affix determines its gender. This can be demonstrated by looking at the gender properties of the nouns given in section 4.1 above. The data are presented in this section in the same groupings as in section 4.1, i.e. by number affix, and their gender class is noted. The gender of each noun was established by checking the gender agreement markers (as noted in table 4.1) present on possessors (such as those given in (4.12-4.21)), on demonstratives (4.23), or on verbs (4.24).

- (4.23) a. aʔa n-asá:sá [ɲɔɾɔɲɔɾɔ́ jǎ]
 1SG 1SG-want k.o.spear PROX.M
 ‘I want this spear’
- b. aʔa n-i:tini [muru mɔ́]
 1SG 1/2SG-see rabbit PROX.F
 ‘I see this rabbit’
- c. aʔa n-asá:sá [kânʦǎ nɔ́]
 1SG 1SG-want k.o.spear PROX.N
 ‘I want this spear’

- (4.24) a. **mi:te** \emptyset -**akú** **ó:jó**
 ox 3M-eat grass
 ‘The ox is eating grass’
- b. **kɪbé** **m-akú** **ó:jó**
 she.goat 3F-eat grass
 ‘The goat is eating grass’
- c. **kɪbɪ-mí** **k-akú** **ó:jó**
 she.goat-PL 3N-eat grass
 ‘The goats are eating grass’

Ordering nouns by number affix in this way will demonstrate that for nouns with a number-marking affix, gender classification is a property of the affix and not the root. In each of the following data lists (4.25-4.33) the gender of the marked form is consistent for each affix. This has the further consequence that the gender of a noun in the plural may differ from that used in the singular, in fact, this is usually the case.

4.3.1 Plurative affixes

Plurative prefix *nV-*

For nouns which take the plurative prefix *nV-*, the unmarked form may come from either the Masculine or the Feminine class, but the marked form is always in the Neuter class. The nouns of this type given in (4.1) are shown with their genders in (4.25).

(4.25)	Unmarked form (sg)	Gender	Prefixed form (pl)	Gender	Gloss
a.	kisírindí	Masc	ni-kisírindí	Neuter	k.o. musical instrument
b.	jónnô	Masc	no-jónnô	Neuter	necklace bead
c.	kerdé	Fem	ne-kerdé	Neuter	calabash plate
d.	ᵑᵑᵑᵑᵑᵑ	Masc	nᵑ-ᵑᵑᵑᵑᵑᵑ	Neuter	k.o. spear
e.	buɽɽúlu	Masc	nũ-buɽɽúlu	Neuter	ground
f.	lamă:dʒá	Fem	nă:-lamă:dʒá	Neuter	ginding room
g.	kɔɓ	Masc	nʒ:-kólɓ	Neuter	eagle
h.	urú:nú	Masc	nuk-urú:nú	Neuter	year, era
i.	teré	Masc	neke-teré	Neuter	moon, month
j.	karakanɽa	Masc	nak-kárákânɽa	Neuter	mushroom
k.	ú:tú	Masc	nuŋk-ú:tú	Neuter	head

Plurative prefix *kV-*

For nouns which take the plurative prefix /*kV-*/, the unmarked form may come from either the Masculine or the Feminine class, but the marked form is always in the Neuter class. The nouns of this type given in (4.2) are shown with their genders in (4.26).

(4.26)	Unmarked form (sg)	Gender	Prefixed form (pl)	Gender	Gloss
a.	ʈɪŋʈĩ	Masc	kɪ-ʈɪŋʈĩ	Neuter	bell
b.	ʈaŋká	Fem	ka-ʈaŋká	Neuter	butterfly
c.	mɔŋŋɔ	Fem	kɔ-mɔŋŋɔ	Neuter	elephant
d.	te:fe	Masc	ke-té:fê	Neuter	friend
e.	ʈɪmbi	Masc	ki-ʈɪmbĩ	Neuter	cockerel
f.	ambâ	Fem	kab-ám̄bâ	Neuter	drum
g.	sɔrɔ	Masc <i>or</i> Fem	kɪsɪn-sórɔ	Neuter	blind person

Plurative suffix *-iní*

For nouns which take the plurative suffix *-iní*, the unmarked form may come from either the Masculine or the Feminine class, but the marked form is always in the Neuter class. The nouns of this type given in (4.3) are shown with their genders in (4.27).

(4.27)	Unmarked form (sg)	Gender	Suffixed form (pl)	Gender	Gloss
a.	kɪbé	Fem	kɪbí-iní	Neuter	goat
b.	kɔbɔ	Masc	kɔbɔ-iní	Neuter	bone
c.	ʈɪrɔ	Masc <i>or</i> Fem	ʈɪ-iní	Neuter	dog

Looking at the examples listed so far, it is clear why the third agreement class is sometimes taken to indicate plural number rather than neuter gender. All of the plurative affixes given so far trigger a change from a semantically singular noun which takes either Masculine or Feminine agreement to a semantically plural noun which takes agreement of the third type. Moreover, the affixes in (4.25–4.27) are the more productive ones, accounting for the vast majority of plurative marking. As such, the majority of semantically plural nouns fall into this class.

Plurative prefix *mV-*

In contrast to the data presented above, nouns which take the plurative prefix *mV-* do not trigger Neuter agreement; instead, the marked, plurative form of the noun belongs to the second class, Feminine. The unmarked, singular nouns may come from any of the three classes. The nouns of this type given in (4.4) are shown with their genders in (4.28).

(4.28)	Unmarked form (sg)	Gender	Prefixed form (pl)	Gender	Gloss
a.	kanʦá	Neuter	ma-kanʦá	Fem	k.o. spear
b.	kǔ:fi	Masc	mu-kú:fi	Fem	stick
c.	kuɽɔbá	Fem	mu-kuɽɔbá	Fem	knife
d.	kúɖɖô	Masc	mu-kúɖɖô	Fem	spoon

In summary, for plurative nouns: in the vast majority of cases, the unmarked (semantically singular) form belongs to either the Masculine or Feminine class, while the marked (semantically plural) form belongs to the third class, Neuter. However, this is not the case for nouns which take the *mV-* plurative prefix. The unmarked (semantically singular) form may belong to any of the three gender classes, while the marked (semantically plural) form triggers Feminine agreement.

4.3.2 Singulative prefixes

A similar pattern emerges for the Singulative prefixes.

Singulative prefix *t-*

For nouns which take the singulative prefix *t-*, the unmarked form (that is, the semantically plural form) may belong to any of the three gender classes, while the marked, semantically singular, form belongs almost exclusively to the third gender class. The nouns of this type given in (4.5) are shown with their genders in (4.29).

(4.29)	Prefixed form (sg)	Gender	Unmarked form (pl)	Gender	Gloss
a.	tu-kubúppú	Neuter	kubúppú	Neuter	k.o. tree
b.	t-ukulumǫ́	Neuter	ukulumǫ́	Masc	wild gourd
c.	te-mereké	Neuter	mereké	Fem	sesame
d.	ta-ma:ka	Neuter	ma:ka	Fem	glue
e.	t-ǫ́nǫ́	Neuter	anǫ́	Masc	heart, breast
f.	t-irippi	Fem	irippi	Masc	ball
g.	tiŋ-kisi	Neuter	kisi	Neuter	bead
h.	tǫ́ŋ-kǫ́ŋǫ́	Neuter	kǫ́ŋǫ́	Fem	perfume
i.	tǫ́n:ǫ́	Neuter	ǫ́	Masc	fodder

There is one apparent exception to the general pattern here. (4.29f) is Feminine in its semantically singular form despite being formed by means of the *t-* singulative prefix. This is the only example in my data of a gender inconsistency within a single affix set.

An additional data set is found in Gilley (2013). Of the 50 nouns with singulative *t-* listed there, 47 are Neuter and three are Feminine (one of which is *tirippi* as in (4.29f)). Gilley's data therefore confirm these findings: nouns with singulative *t-* are overwhelmingly Neuter, but a few are Feminine.

Singulative prefix *nt-/ns-*

For nouns which take the singulative prefix *nt-* and its variants, the unmarked form (that is, the semantically plural form) may belong to any of the three gender classes, while the marked, semantically singular, form belongs exclusively to the Neuter class. The nouns of this type given in (4.6) are shown with their genders in (4.30).

(4.30)	Prefixed form (sg)	Gender	Unmarked form (pl)	Gender	Gloss
a.	nt-oké	Neuter	oké	Masc	guinea fowl
b.	ns-ekete	Neuter	ekete	Masc	wing
c.	ns-ikilí	Neuter	ikilí	Masc	belt
d.	n-to:jo	Neuter	to:jo	Fem	seed
e.	ntin-is:í	Neuter	is:í	Neuter	gun ⁷
f.	ntǫ́n:ǫ́	Neuter	ǫ́	Masc	grass

⁷The primary meaning of *is:í* is 'fire', which is an uncountable noun with no singulative/plurative

Singulative prefix *ǂ-*

For nouns which take the singulative prefix *ǂ-*, the unmarked form (that is, the semantically plural form) is always Masculine. Only a few nouns take this prefix, and it may simply be a coincidence that all of these are Masculine in their unmarked forms, or it may be that this prefix only attaches to Masculine nouns. However, it is surely not a coincidence that the marked, semantically singular, forms are once again all the same gender: in this case, Masculine. The nouns of this type given in (4.7) are shown with their genders in (4.31).

(4.31)	Prefixed form (sg)	Gender	Unmarked form (pl)	Gender	Gloss
a.	<i>ǂɪ-kɪr̥ɪ:sí</i>	Masc	<i>kɪr̥ɪ:sí</i>	Masc	tick
b.	<i>ǂ-ǔ:</i>	Masc	<i>ǔ:</i>	Masc	bear
c.	<i>ǂ-eléttê</i>	Masc	<i>eléttê</i>	Masc	bat
d.	<i>ǂ-ǎ:ǰá</i>	Masc	<i>ǎ:ǰa</i>	Masc	wild cat

In summary, for singulative nouns: the unmarked (semantically plural) form may belong to any agreement class, while the agreement class of the marked (semantically singular) form is determined by the singulative prefix. As is the case for plurative nouns, in the majority of cases, the marked form belongs to the Neuter class. However, this is not the case for the relatively small number of nouns which take the *ǂ-* singulative prefix. In this case, the unmarked (semantically plural) form is Masculine, and the marked (semantically singular) form also triggers Masculine agreement.

4.3.3 Replacive marking

In section 4.1.3 it was suggested that the replacive affixes are simply further examples of the normal singulative and plurative affixes which happen to be used in combination. If this is true, it is to be expected that replacive affixes will determine the gender of their nouns in just the same way as non-replacive affixes do. Moreover, it should also be expected that any given affix will assign the same gender to a noun regardless of whether or not it is used replacively. And this is exactly what we find. It can easily be demonstrated by taking the replacive nouns given in (4.10–4.11) and sorting them by prefix.

The table in (4.32) lists these nouns sorted by their plurative prefix. It can be seen that in each case the gender of the semantically plural noun is the same as for non-replacive nouns marked with these same plurative prefixes: In (a-d), where the plurative prefix is *nV-* (or variants thereof), the gender of the nouns is Neuter, just as

morphology. It can also mean ‘gunfire’, which one might guess is also uncountable, though I have not checked this. It is obviously a short semantic extension from ‘gunfire’ to the countable plural ‘guns’, and thence to a singulative form.

was the case in (4.25); in (e–i), where the plurative prefix is *kV-* (or variants thereof), the gender of the nouns is Neuter, just as in (4.26); in (j–m), where the plurative prefix is *mV-*, the gender of the nouns is Feminine, just as in (4.28). The prefix *ap-* (n–p) does not exist as a plurative prefix in a non-replacive context but, like all other number affixes, it determines the gender of the noun consistently (in this case, Masculine).

(4.32)	Singular form	Gender	Plural form	Gender	Gloss
a.	m-í:te	Masc	nik-í:te	Neuter	ox
b.	m-ottó	Masc	nok-ottó	Neuter	horse
c.	m-iri	Masc <i>or</i> Fem	nikíŋk-írí	Neuter	deaf person
d.	mɔ-ɔrɔ	Fem	nikíŋk-órɔ	Neuter	nose
e.	t-ummba	Fem	kub-ummba	Neuter	cave
f.	nt-ɔlɔntɔ	Neuter	k-ɔlɔntɔ	Neuter	feather
g.	m-ɔsólá:ká	Fem	k-ɔsólá:ká	Neuter	finger nail, claw
h.	m-ɔtóké:de	Fem	k-ɔtóké:de	Neuter	hoof
i.	m-ɔtɔŋkó:rɔ	Fem	k-ɔtɔŋkó:rɔ	Neuter	elbow
j.	n-tí:do	Neuter	mi-tí:do	Fem	k.o. tree
k.	n-tíjje	Neuter	mi-tíjje	Fem	k.o. tree
l.	ntun-u:fé	Neuter	m-ú:fé	Fem	k.o. tree
m.	tɔŋ-kile	Neuter	mi-kile	Fem	sorghum
n.	s-e:de	Masc	ap-e:de	Masc	water pot
o.	s-ɔ:rɔ	Masc	ap-ɔ:rɔ	Masc	grain basket
p.	ns-e:ra	Neuter	ap-e:ra	Masc	fence

Exactly the same is seen to be true for semantically singular replacive nouns. The nouns in (4.32) are listed again in (4.33), but this time sorted by the singulative prefix. It can be seen that in each case the gender of the semantically singular noun is the same as for non-replacive nouns marked with these same singulative prefixes: In (a–b), where the singulative prefix is *t-* (or variants thereof), the gender of the nouns is either Neuter or Feminine, just as was the case in (4.29); in (c–g), where the singulative prefix is *nt-* (or variants thereof), the gender of the nouns is Neuter, just as in (4.30). The singulative prefixes *mV-* (h–k) and *s-* (l–m) do not exist as singulative prefixes in a non-replacive context but, like all other number affixes, they determine the gender of the nouns consistently (Feminine and Masculine, respectively). The nouns in (n–p) refer

to animate males and so they have Masculine gender (as noted in section 4.2), despite having the *mV*-singulative prefix which would otherwise trigger Feminine agreement.

(4.33)	Singular form	Gender	Plural form	Gender	Gloss
a.	tɪŋ-kɪle	Neuter	mɪ-kɪle	Fem	sorghum
b.	t-ʊmmba	Fem	kʊb-ʊmmba	Neuter	cave
c.	nt-ɔlɔntɔ	Neuter	k-ɔlɔntɔ	Neuter	feather
d.	n-tí:do	Neuter	mi-tí:do	Fem	k.o. tree
e.	n-tíjje	Neuter	mɪ-tíjje	Fem	k.o. tree
f.	ntun-u:fé	Neuter	m-ú:fé	Fem	k.o. tree
g.	ns-e:ra	Neuter	aŋ-e:ra	Masc	fence
h.	m-ʊsólá:ká	Fem	k-ʊsólá:ká	Neuter	finger nail, claw
i.	m-ʊtóké:de	Fem	k-ʊtóké:de	Neuter	hoof
j.	mɓ-ɔrɔ	Fem	nikíŋk-ɔrɔ	Neuter	nose
k.	m-ɔtɔŋkɔ:rɔ	Fem	k-ɪtɔŋkɔ:rɔ	Neuter	elbow
l.	s-e:de	Masc	aŋ-e:de	Masc	water pot
m.	s-ɔ:rɔ	Masc	aŋ-ɔ:rɔ	Masc	grain basket
n.	m-í:te	Masc	nik-í:te	Neuter	ox
o.	m-uttú	Masc	nuk-uttú	Neuter	horse
p.	m-iri	Masc <i>or</i> Fem	nikíŋk-írí	Neuter	deaf person

4.3.4 Summary

It was demonstrated in section 4.2 that Katcha has three gender classes and that the *semantic* number of an unmarked noun is not generally relevant to its gender agreement properties (other than in the case of male/female animate referents). However, it has been shown in this section that *morphological* number is very relevant to gender, since the number-marking affix on a noun assigns it gender. For nouns which are morphologically marked for number, gender classification is a property of the number affix and not of the root noun.

Because a noun's gender is determined by its number-marking affix, this may result in differing gender between semantically singular and semantically plural forms of the

same noun. This phenomenon, known as *polarity* (following Meinhof (1910:135-6)), is well attested in the Cushitic and Semitic branches of Afroasiatic. Dimmendaal (1987:172) speculates whether polarity in Krongo may indicate earlier contact between the Kadu languages and other language families. Whatever the origins, in Katcha a noun’s gender in the singular may differ from its gender in the plural and this is determined by the singulative or plurative affix. There is therefore a very clear interaction between number marking and nominal gender.

4.4 The third gender as ‘Plural’

4.4.1 Plural gender in Katcha

A second aspect of the interaction between number and gender is seen when we consider the semantic basis of the third gender class. Up to this point, I have followed Tucker and Bryan (1966) in referring to this third class as ‘Neuter’. This reflects the fact that this is a gender agreement class, in opposition to the classes of Masculine and Feminine. However, to refer to this class as ‘neuter’ is to miss out on the importance of its connection with plural number.

It was mentioned in section 4.2 that some research on Katcha grammar (eg. Waag 2012) has assumed that the third concord agreement marker (ie. /n-/ for nominal modifiers, /k-/ for verbal subject agreement markers) marks plural number rather than a third gender. That people make this assumption would be surprising if there were no reason for it. But in fact, there are some very good reasons for it: the third gender is intimately related to the notion of plural number.

The first reason is a statistical one. As shown in section 4.3.1, the vast majority of marked plurals belong to the third gender (while their corresponding semantically singular (unmarked) forms belong to either Masculine or Feminine gender). It is not surprising that a casual observation would cause one to assume that the /n/ concord marker indicates plural number.

The second reason the third gender has been thought of as plural number is a structural one: there is a strong morphological connection between the third gender and plural number. The agreement marker which denotes the third gender is the same as that which denotes semantic plural. That is to say, a noun with a numerically plural animate referent triggers the same agreement as one which belongs to the third gender.

Evidence of the unity of these categories comes from pronouns. The pronoun used to refer to the third gender is the same as the third person plural pronoun. Thus in (4.34a) the pronoun *é:ke* refers to the ‘neuter’ noun *kanṭá*, ‘spear’, while in (4.34b) it refers to the plural human referent *kúkkú nca kákká*.

- (4.34) a. **n-ici** **ɔʔo kanʔá ? í,** **aʔa n-ici** **é:ke**
 1/2S-see 2S spear ? yes, 1S 1/2S-see 3N
 ‘Do you see the spear? Yes, I see it.’
- b. **n-ici** **ɔʔo kókkú nca** **kákká ? í,** **aʔa n-ici** **é:ke**
 1/2S-see 2S Kuku ACCOMP Kaka ? yes, 1S 1/2S-see 3PL
 ‘Do you see Kuku and Kaka? Yes, I see them.’

The unity of these categories can also be seen in nominal modifiers, such as relative clauses. In (4.35a) the morphemes which mark the relative clause are *ná...nó*, agreeing with the ‘neuter’ noun *kanʔá*; in (4.35b) the same relative markers are used in agreement with the plural noun phrase *jaku:b nca juhana*.

- (4.35) a. **kanʔá ná** **ma:la** **nó** **k-ɔʔɔŋkɔɔ**
 spear REL.N be.brown REL.N PL-long
 ‘The brown spear is long.’
- b. **A** **Yakuub nja** **Yühanna,... no** **linggo nja** **iini no**
a **jaku:b nca juhana,** **na** **lɪŋkɔ nca** **i:ni nɔ**
 SUBJ Jacob with John, REL.PL work with 3M REL.PL
 ‘James and John, who worked with him’ (LUK 5.10)

Finally, the same holds for predicates. In (4.35a), repeated with the verbal agreement morpheme highlighted as (4.36a), the subject agreement marker on the verb is /k/, agreeing with the ‘neuter’ noun *kanʔá*; in (4.36b) the verb also carries the subject agreement marker /k/, agreeing with the plural subject *katala:tene*.

- (4.36) a. **kanʔá ná** **ma:la** **nó** **k-ɔʔɔŋkɔɔ**
 spear REL.N be.brown REL.N PL-long
 ‘The brown spear is long.’
- b. **katalaadene nüüdü** **kagu** **eema** **kooye**
k-atala:tene nu-utu **k-aku** **e:ma** **k-ɔʔje**
 PL-disciple POSS.PL-2SG PL-eat things PL-drink
 ‘your disciples eat and drink’ (LUK 5.33)

The morphological unity between the third gender and plural number seen in (4.34–4.36) cannot easily be dismissed as mere homophony. It was shown in section 4.2 that the gender class a noun belongs to is not a reflection of its semantic number. Semantically plural nouns may trigger any of the three agreement patterns, as may semantically singular nouns. To suggest that many, but not all, plural nouns require agreement with their number rather than their gender significantly complicates the picture, and causes a suspicious duplication of classes. As summarised in Table 4.2,

there would be semantically singular nouns taking Masculine, Feminine and Neuter agreements, there would be semantically plural nouns taking Masculine and Feminine agreements and there would be semantically plural nouns triggering number agreement instead of gender agreement. There might also be semantically plural nouns which take Neuter agreement, but since these would be homophonous with the semantically plural nouns taking plural number agreement, there would be no way to know. Moreover, there is no evidence that semantically plural nouns which require gender (ie. Masculine or Feminine) agreement should be treated as special cases.

	Masculine	Feminine	Neuter	Plural
Semantically Singular	j-	m-	n-	
Semantically Plural	j-	m-	?	n-

Table 4.2: A possible distribution of attributive agreement markers

Assuming that the agreement in examples (4.34b–4.36b) is agreement with plural number therefore leads to an analysis that is unnecessarily complex. A more straightforward analysis is obtained by assuming that the third class of agreement is always gender agreement. This means that there are three genders in Katcha. To a large extent, number is irrelevant: nouns may belong to any of the three gender classes, regardless of semantic number. However, there is a special relationship between the third gender and plural number. Co-ordinate referents, as in (4.34b–4.35b), take third gender agreement, as do semantically plural referents where there is no conflicting linguistic antecedent, as discussed in regard to (4.37) below. This is an important fact which is missed if we think of the third gender as ‘Neuter’. It more closely captures the agreement facts to consider this third gender as *Plural*, as long as it is understood that this is a grammaticalised version of Plural, not necessarily correlating to semantic number.

<i>Gender</i>	Masculine	Feminine	Plural
	j-	m-	n-

Table 4.3: Attributive agreement markers in Katcha

The incorporation of Plural into the gender system may cause mismatches between the syntactic gender of a lexeme and its semantic number, leading to some variation in agreement behaviour. In (4.37), for example, *la:lá*, ‘boys’ is Masculine gender, but has plural semantic number. Both masculine and plural agreement are attested.

(4.37) *la:lá* Ø-*ánná* *ká* *dí* *j-íŋkɔʔó* *já*, *k-ataʔa:ká*
 boys 3M.stay LOC house REL.M-be.one REL.M PL-be.ten

There were ten boys who lived in the same house. (Lit. some boys lived in one house, they were ten) (THIEF:1.1)

The verb, *ánná*, shows Masculine agreement, agreeing with the syntactic gender of its subject, *la:lá*. In the following clause where the subject is not overt (and through the rest of the text) the verb shows Plural agreement, agreeing with the semantic number of the noun's referent. Note that there is no 'Neuter' noun to act as an antecedent for the subject agreement marker on the second verb; in this case the agreement is clearly with the plural number. Corbett (1991:225-260) describes nouns with this kind of variable agreement as 'hybrid' nouns. He posits an agreement hierarchy according to which certain types of agreeing morphemes (in Corbett's terminology, 'agreement targets') are more likely to agree with the syntactic gender of their controller, while others are more likely to agree with its semantic gender. He also notes that,

For any particular target type, the further it is removed from its controller, the greater the likelihood of semantic agreement (Corbett 1991:240).

It seems that something like this is what is happening in (4.37). The subject agreement marker in the same clause as the hybrid noun agrees with its syntactic gender (Masculine), while the subject agreement marker in the later clause agrees with its semantic number (Plural).⁸

There is potential confusion in naming this gender class *Plural* and for practical reasons it may be that an alternative name would ideally be found. Nonetheless, thinking of this gender class as plural fits the agreement facts of Katcha and is logical. Assuming with Corbett (1991:8) that 'there is always a semantic core to the assignment system', (in other words, gender classes always have a semantic basis), the 'semantic core' of the third gender is clearly plurality. To name this gender class *Plural* is merely an extension of the same class-naming convention which grammarians have followed for the last two millennia: there are three gender classes in Katcha; animate males generally belong to the first class so we may refer to it as *Masculine*; animate females generally belong to the second class, so we may refer to it as *Feminine*; animate plurals generally belong to the third class, so we may refer to it as *Plural*.

⁸It could be argued that masculinity is as salient a feature of a group of boys as plurality. I have therefore stopped short of suggesting that in the case of *la:lá*, Plural is the word's 'semantic gender', though this would certainly fit with Corbett's hypothesis. It may be that the non-local agreement in (4.37) is actually with number, rather than 'semantic gender'. Nonetheless, it is clear that the local agreement is with the word's syntactic gender, while the more distant agreement is more semantically based. In the case of *íjǎ*, 'women', whose syntactic gender is Plural, there is no such gender mis-match: both local and non-local agreeing morphemes show plural agreement. It would be instructive to see what happens in the case of a semantically singular noun with Plural syntactic gender, such as *kanʔá*, 'spear': local agreement is always with the syntactic gender (Plural) as expected, but I do not have data on non-local agreement.

4.4.2 Plural gender in Cushitic languages

Katcha may be analysed as having a system of three genders, based around the features of Masculine, Feminine and Plural. Such a system is typologically unusual, but it is not totally unattested. Gender systems like this have been argued to exist in several languages in North Eastern Africa. Interestingly, these languages are neither Niger-Congo nor Nilo-Saharan (the two families to which Kadu has been ascribed in the past), but are from the Cushitic family of Afro-Asiatic:

In contrast to other languages that have three-way gender distinction systems, this third value is not neuter in Cushitic. In terms of agreement, this third gender value requires the same agreement pattern as the third person plural. As a result, it is called “plural” gender in many studies of Cushitic languages (Tsegaye *et al.* 2013:191).

Languages where plural gender has been argued to exist include Bayso (Hayward 1979), Arbore (Hayward 1984), Iraqw (Mous 1993, 2008) and Konso (Orkaydo 2013; Tsegaye *et al.* 2013). The analysis of Plural as a gender is not without controversy. Alternative analyses have been proposed (eg. Corbett and Hayward (1987), Corbett (2012:224-233) for Bayso), and the exclusion on principle of plural from the gender system has been discussed (see Mous (2008) and Corbett (2012:223-263) for opposing arguments).

Whatever analysis one offers for such data, there is at least a tradition among Cushiticists of describing gender in these terms. From a typological point of view, the interesting facts are that data very similar to those presented here are found in some Cushitic languages and that, to my knowledge, Katcha is the first language where such phenomena have been recorded outwith Cushitic.

4.5 Conclusion

Nominal morphology and classification interact in Katcha in ways which arguably weaken the distinction between the categories of number and gender and which reflect ongoing questions over the genetic affiliation of the Kadu languages.

The morphology of nouns is based on number, with a tripartite system reminiscent of that found in some Nilo-Saharan (particularly Nilotic) languages. Katcha nouns show number by way of affixes, the majority of nouns taking either singulative affixes or plurative affixes. There is a third type of noun which takes both singulative and plurative affixes (‘replacive’). Within the replacive nouns there is some evidence that the morphology may indicate semantic groupings of nouns: a tendency for certain singulative affixes to be paired with certain plurative affixes according to the semantics of the noun. In this respect, the nominal morphology is reminiscent of the Niger-Congo noun classes of Katcha’s Kordofanian neighbours. However, these semantic

groupings do *not* form agreement classes. Rather, the interaction between morphology and classification comes from the fact that individual affixes determine agreement. For nouns that are morphologically marked for number, gender classification is a property of the number affix, not the root noun. This may mean that the gender of a semantically singular noun differs from its gender when semantically plural, something which is associated with Afro-Asiatic languages.

Katcha has three gender classes, which can be described as being based around the semantic notions of *masculine*, *feminine* and *plural*. The agreement patterns required by nouns of the masculine class are the same as the third person masculine, the agreement patterns required by nouns of the feminine class are the same as the third person feminine and the agreement patterns required by nouns of the plural class are the same as the third person plural. The assignment of gender to nouns may be summarized as follows:

1. Animate nouns — Nouns referring to males are generally masculine, nouns referring to females are generally feminine and nouns referring to more than one individual are generally plural.
2. Non-animate, numerically unmarked nouns — May belong to any gender class. There are no obvious semantic gender assignment rules, though it may be that further research might reveal more systematicity.
3. Numerically marked nouns — Gender class is assigned by the singulative or plurative affix.

The notion of plural as a value of the gender feature is controversial but it has been posited for a number of languages within the Cushitic branch of Afro-Asiatic.

The complex interaction between the categories of number and gender in Katcha is interesting in its own right. But it is particularly interesting in the context of the question of the genetic lineage of the Kadu languages. Katcha nominal morphology and classification shows notable characteristics of all three of the major language phyla in the region. Whether these characteristics were borrowed or inherited, it is little wonder that the affiliation of this language family has been a matter of debate.

Chapter 5

Nominal Modifiers

Introduction

In Katcha, nominal modifiers follow the noun. These modifiers comprise demonstratives, possessors, relative clauses and ‘adjectives’. Although Katcha nouns do not show gender overtly, gender agreement is shown within the noun phrase with the modifier morphologically marked to agree with the gender of the head noun. With the exception of the medial and distal demonstrative pronouns, there is considerable uniformity in the form of nominal modifiers: all are introduced by /j/ (masculine), /m/ (feminine) or /n/ (plural gender). This chapter describes the various modifiers and argues that a unified analysis can be provided by considering this morpheme to be (a phonologically weakened version of) the proximal demonstrative pronoun.

Sections 5.1–5.3 present a description of the three main types of nominal modifiers in Katcha, namely demonstratives, possessive noun phrases and relative clauses. It is noted that in each case, nominal modifiers agree with the head noun in gender, are morphologically marked when the noun they modify is a peripheral argument of the verb, and can occur in ‘headless’ constructions where there is no overt noun to be modified. In the latter case they have a pronominal interpretation.

Section 5.4 then goes on to argue the case for treating nominal modifiers as demonstrative pronouns, or as phrases headed by demonstrative pronouns, which are appositional to the modified noun. Phonological evidence is presented that suggests that the different forms of modifier occur in complementary distribution and are therefore allomorphs. This is followed by a discussion of the morphosyntactic data presented in the first three sections and it is argued that assuming the modifying morpheme to be the proximal demonstrative pronoun allows the incorporation of the medial and distal pronouns into the system and explains why the latter have a different form, but identical distribution to all other nominal modifiers.

Finally, section 5.5 adds some cross-linguistic perspective by discussing the rela-

	Proximal	Medial	Distal
Masculine	já	ékê	ín:î
Feminine	mó	ɔkɔ	um:û
Plural gender	nó	ékê	ín:î

Table 5.1: Demonstrative pronouns

tionship between the analysis of Katcha outlined here and two notions which have been argued to be appropriate to a number of African languages. The first is the relative marker, a relativizing element which is neither a relative pronoun nor a relative complementizer and whose primary function, indicated by agreement, is to encode the attribution of the relative clause to the head. The second is the construct state, in which possession or other modification is signalled by morphological marking of the head. It is suggested that both of these typically African constructions may result from grammaticalization of the demonstrative pronoun which heads the nominal modifier.

5.1 Demonstratives

The demonstrative in Katcha follows the noun, coming at the end of the noun phrase. The form of the demonstrative depends on the degree of distance and the gender of the noun, as listed in table 5.1.

The proximal demonstrative is by far the most commonly occurring. As well as being used for physical deixis, it is used in discourse to refer anaphorically to linguistic antecedents. Examples of spontaneous use are numerous (5.1).

- (5.1) a. **omudi já adí:la**
 man PROX.M 3M.good
 ‘That man is good’ (ADVICE:1.1)
- b. **akká mó tá:lɔ m-áđi:lá ɔ**
 woman PROX.F NEG 3F-good very
 ‘This woman is not good at all’ (ADVICE:1.32)
- c. **katú nó k-áđi:lá**
 people PROX.P 3P-good
 ‘Those people are good’ (ADVICE:1.3)

The medial and distal demonstratives appear only to be used for physical deixis and therefore occur much less frequently. Spontaneously occurring examples of them being used to modify a noun are harder to come by, but examples gathered through controlled

elicitation largely concur with those given by Stevenson (1941:58–60).¹ Examples are given with a masculine noun (5.2), a feminine noun (5.3) and a plural gender noun (5.4).

- (5.2) a. **aʔa n-asá:sá kɔɔkɔɔrɔ́ já**
 1SG 1SG-want k.o.spear **PROX.M**
 ‘I want this spear’
- b. **aʔa n-asá:sá kɔɔkɔɔrɔ́ ékê**
 1SG 1SG-want k.o.spear **MED.M/P**
 ‘I want that spear’
- c. **aʔa n-asá:sá kɔɔkɔɔrɔ́ ínî**
 1SG 1SG-want k.o.spear **DIST.M/P**
 ‘I want that spear (way over there)’
- (5.3) a. **aʔa n-asá:sá tɔlɔ mɔ́**
 1SG 1SG-want gourd **PROX.F**
 ‘I want this gourd’
- b. **aʔa n-asá:sá tɔlɔ ɔkɔ́**
 1SG 1SG-want gourd **MED.F**
 ‘I want that gourd’
- c. **aʔa n-asá:sá tɔlɔ um:ú**
 1SG 1SG-want gourd **DIST.F**
 ‘I want that gourd (way over there)’
- (5.4) a. **aʔa n-asá:sá kânɕá nɔ́**
 1SG 1SG-want k.o.spear **PROX.P**
 ‘I want this spear’
- b. **aʔa n-asá:sá kânɕá ékê**
 1SG 1SG-want k.o.spear **MED.M/P**
 ‘I want that spear’
- c. **aʔa n-asá:sá kânɕá ínî**
 1SG 1SG-want k.o.spear **DIST.M/P**
 ‘I want that spear (way over there)’

¹My data matches Stevenson’s for the medials, and also for the masculine and plural distals. Stevenson does not give a separate feminine form of the distal demonstrative, but instead suggests that a feminine form of *in:i* exists, namely *m-in:i*. He also gives *k-in:i* as an alternative plural form, so it seems that this refers to a predicative use of *in:i* (‘be there’). Stevenson does also acknowledge the existence of *um:u*, though he suggests it is an emphatic version of *mɔ́*.

5.1.1 Demonstratives modifying Peripheral Arguments

When demonstratives occur with a noun which is not a core argument of the verb, this is marked morphologically by adding a prefix *t-* to the demonstrative (5.6).

- (5.5) aʔa n-asá:sá [tɪjkere nɔ́]
 1SG 1SG-want bed PROX.P
 ‘I want this bed’

- (5.6) a. aʔa n-afóŋɔ́ [ká tɪjkéré tá-nɔ́]
 1SG 1SG-sleep LOC bed OBL-PROX.P
 ‘I sleep on this bed’
 b. aʔa n-afóŋɔ́ [ká tɪjkéré t-ékê]
 1SG 1SG-sleep LOC bed OBL-MED.M/P
 ‘I sleep on that bed’
 c. aʔa n-afóŋɔ́ [ká tɪjkéré t-ín:í]
 1SG 1SG-sleep LOC bed OBL-DIST.M/P
 ‘I sleep on that bed (way over there)’

5.1.2 Demonstratives as Pronouns

It is not necessary to include the head noun; a noun phrase may be made up of only the demonstrative:

- (5.7) a. aʔa n-asá:sá já
 1SG 1SG-want PROX.M
 ‘I want this one’
 b. aʔa n-asá:sá ékê
 1SG 1SG-want MED.M/P
 ‘I want that one’
 c. aʔa n-asá:sá ín:í
 1SG 1SG-want DIST.M/P
 ‘I want that one (way over there)’

This suggests that the demonstrative may be considered a pronoun rather than merely a determiner. Indeed, it is possible to answer a question such as (5.8) with a single word answer (5.9a-c):

- (5.8) ɠɔɠɔɠɔɠɔ ɔ́ɔɔ ɪʔɪ ɪɣɔ́ ǎ útu k-asá:sâ
 k.o.spear which 3MS 3MS.exist DAT 2S DCM-want
 ‘Which spear do you want?’

- (5.9) a. *ǎ*
 PROX.M
 ‘This one’
 b. *éké*
 MED.M
 ‘That one’
 c. *íní*
 DIST.M
 ‘That one (way over there)’

It is possible that (5.7) and (5.9) are examples of ellipsis, or that Katcha has both demonstrative pronouns and demonstrative determiners which are homophonous. However, Diessel (1999:60) finds that in most languages, ‘there is no evidence that pronominal and adnominal demonstratives belong to different categories’ and this seems to be the case in Katcha. Not only is there no indication that demonstratives belong to the same paradigm as determiners such as definite or indefinite articles, there is no evidence that such determiners exist in Katcha. The fact that noun phrases most commonly consist of only a noun suggests strongly that Katcha has no articles (Dryer 2007:152). Likewise, the fact that both nouns and demonstratives can occur alone in noun phrases suggests there is no dependency relationship between them. It seems likely that ‘determiner’ does not exist as a syntactic category in Katcha, and that all occurrences of demonstratives are therefore pronouns.

5.2 Possessive Noun Phrases

In possessive constructions the possessor, as the modifier, follows the head noun (the possessee). They are linked by a ‘possessive particle’ *ǎ/má/ná*. Phonologically, this morpheme may be more closely linked to the modifier, but syntactically its connection is with the head, as this is the noun with which it shows gender agreement (5.10). As such, it does not seem accurate to describe this as a marker on the possessor noun (which would make it essentially a genitive case marker, in the style of Indo-European). Nor would it be accurate to describe it as a marker on the head noun (which might be called a construct marker, in the style of Semitic - though see section 5.5.2 for further discussion of this idea). Rather, it is a possessive linking particle which cliticises to the following noun.

- (5.10) a. **ɲɔɾɔɲɔɾɔ́ já** kókkô
 k.o.spear POSS.M Kuku
 ‘Kuku’s spear’
- b. **tɔɔ má** kókkô
 gourd POSS.F Kuku
 ‘Kuku’s gourd’
- c. **kânɲá ná** kókkô
 k.o.spear POSS.P Kuku
 ‘Kuku’s spear’

When the possessor noun begins with a vowel, the vowel of the possessive marker assimilates to the vowel of the possessor and the possessive marker cliticises to the possessor noun. This can be most easily seen with pronouns such as *eté* in (5.11-5.13).

- (5.11) **aʔa n-asá:sá dī jé-été**
 1SG 1SG-want house POSS.M-1SG
 ‘I want my house’

- (5.12) **aʔa n-asá:sá dī já páppá tí-jé-été**
 1SG 1SG-want house POSS.M father OBL-POSS.M-1SG
 ‘I want my father’s house’

- (5.13) **aʔa n-án:á ká dī tí-já páppá tí-jé-été**
 1SG 1SG-live LOC house OBL-POSS.M father OBL-POSS.M-1SG
- nca é:ja tá-mé-été**
 ACCOMP mother OBL-POSS.F-1SG
- ‘I live in my father’s house with my mother’

Stevenson (1941:48, 1956-57:62) treats pronominal possessors as possessive pronouns which take a gender agreement prefix. That is, he treats *jété* in (5.11) as a possessive pronoun *été* with a masculine agreement prefix *j-*, rather than as a possessive morpheme *já* with a pronoun *été*, as glossed in (5.11). However, there are reasons to disprefer Stevenson’s analysis. One is that this form of the pronoun (but without the gender agreement) is used in many non-possessive contexts, such as dative and locative (see chapter 6). Also, with respect to the *t-* prefix and to gender agreement, the possessor phrases in (5.11-5.13) behave in an exactly parallel way to the possessive particle + noun sequences in (5.10-5.15). These two facts suggest that the ‘possessive pronouns’

should be considered to be possessive particle + pronoun sequences, with the pronoun in the ordinary oblique case.²

Further evidence that possessive pronouns are in fact possessive particle + pronoun sequences may come from the fact that in much of the existing Katcha written material (eg. the draft Bible translation) they are written as separate words when *t-* (marking a peripheral argument) is present, eg. <tiya üütü>. This is despite the fact that possessive pronouns are written as single words when they modify a core argument, eg. <yüütü>. The latter is reflective of the pronunciation, which is identical in both cases, with the exception of some minor tone perturbation: [tíjú:dú] cf [jũ:dú]. It would seem probable that the single-word spelling is reflective of the phonology while the two-word spelling is reflective of the underlying morphology. Where native speakers naturally put their word breaks should certainly not be considered conclusive linguistic evidence, but the existence of the two-word spelling, which does not match the surface phonetics, does lend some additional weight to the argument that there is a psychologically real morpheme break here.

5.2.1 Possessive NPs modifying Peripheral Arguments

When the possessive noun phrase is not a core argument of the verb (i.e. the head noun is itself a possessor phrase or a prepositional phrase) this is marked on the possessive morpheme by prefixing *t-* as in (5.15).

- (5.14) aʔa n-asá:sá [páppá já kókkô]
 1SG 1SG-want father POSS.M Kuku
 ‘I want Kuku’s father’

- (5.15) a. aʔa n-asá:sá dī [já páppá tí-já kókkô]
 1SG 1SG-want house POSS.M father OBL-POSS.M Kuku
 ‘I want Kuku’s father’s house’
 b. aʔa n-akú me:dī [ká dī tí-já kókkô]
 1SG 1SG-eat beans LOC house OBL-POSS.M Kuku
 ‘I am eating beans in Kuku’s house’

²Pronominal case is discussed in section 6.6.

5.2.2 Possessive NPs as Pronouns

Possessive noun phrases may occur without the head noun. Thus it is possible to answer a question such as (5.16a) with the short answer in (b):

- (5.16) a. $\text{ɲɔɾɲɔɾɔ́ ócɔ́ ɪʔɪ ʊŋ:ɔ́ á útú k-asá:sâ}$
 k.o.spear which 3MS 3MS.exist DAT 2S DCM-want
 ‘Which spear do you want?’
 b. já kúkkô
 POSS.M Kuku
 ‘Kuku’s one’

As with demonstratives, this suggests that the possessive particle is pronominal in nature. Again, it might be argued that (5.16b) is an example of ellipsis, but there are also examples from the Katcha texts of possessives being used in a slightly different pronominal manner:

- (5.17) Na hamada nīile
 na hamata ni:le
 POSS.P Hamad Nile
 ‘Those of Hamad Nile (i.e. Hamad Nile’s people/family)’ (SPLA:7)

Example (5.17) occurs at the beginning of a sentence with no linguistic antecedent or other obvious candidate for ellided content. It would seem in this case that the possessive noun phrase is unquestionably pronominal, taking its referent purely from context.

5.3 Relative Clauses

Relative clauses in Katcha are formed using two relative particles, one at the beginning of the relative clause and one at the end. The clause-initial relative marker is *já/má/ná*; the clause-final relative marker is *já/mó/nó*.

Only subjects can be directly relativised in Katcha. There is no subject agreement marker on the verb in a relative clause, being replaced by the relative marker. Verb stems always begin with a vowel, and the vowel of the (first) relative marker in subject relatives elides. At the end of the relative clause is the marker *já/mó/nó*. Both relative markers display agreement with the gender of the head noun (5.18):

- (5.18) a. $\text{mi:te [j-akú ójɔ́ já] ama:la}$
 ox REL.M-eat grass REL.M 3M.be.brown
 ‘The ox which is eating grass is brown’

- b. kibe [m-akú ójǒ mǒ] m-ama:la
 she.goat REL.F-eat grass REL.F 3F-be.brown
 ‘The goat which is eating grass is brown’
- c. kibi-mí [n-akú ójǒ nǒ] k-ak-ama:la
 she.goat-PL REL.P-eat grass REL.P 3P-PL-be.brown
 ‘The goats which are eating grass are brown’

Non-subject relatives are formed in a similar, but slightly different, way. As with subject relatives, the subordinate clause is enclosed by relative markers which show agreement with the head noun. However, the internal structure of the relative clause is different: a non-finite verb is used, being marked by the dependent clause marker *ka* (and sometimes the infinitive marker *t-*). A resumptive pronoun is also common; this does not occur in the case of subject relatives. (5.19a-c) give examples of direct objects being relativised for masculine, feminine and plural gender nouns respectively. (5.20) demonstrates the relativisation of an indirect object and (5.21) gives an example of an oblique argument being relativised. Note that in these examples the word following the (initial) relative marker, the subject of the relative clause, begins with a consonant and the relative marker is consequently realised as [já/má/ná], rather than the [j-/m-/n-] seen in the subject relative examples.

- (5.19) a. mi:te [já kókkû ka ící íńí já] akú ójǒ
 ox REL.M Kuku DCM see 3M REL.M 3M.eat grass
 ‘The ox which Kuku sees is eating grass’
- b. kɔ:kórɔ [má kókkû ka ící ó:kó mǒ] m-ɔjǒ mereké
 hen REL.F Kuku DCM see 3F REL.F 3F-peck sesame
 ‘The hen which Kuku sees is eating sesame’
- c. kanǰá [ná kókkû ka ící é:ké nǒ] k-ɔjǒkɔɔ
 k.o.spear REL.P Kuku DCM see 3P REL.P 3P-be.long
 ‘The spear which Kuku sees is long’
- (5.20) títo [já kókkû ka anáná kanǰá ɪ-mí já] ɔkɔɔ:ɔbɔ
 Tito REL.M Kuku DCM give k.o.spear DAT.3M REL.M 3M.angry
 ‘Tito, who Kuku gives the spear to, is angry’
- (5.21) aʔa n-íci rá:ká [já fíjɔ ka t-akúri kite já]
 1SG 1SG-see field REL.M cow DCM INF-eat there REL.M
 ‘I see the field in which the cow is eating’

Where the subject of the relative clause is a personal pronoun the oblique form of the pronoun is used. All pronouns begin with vowels; the vowel of the relative marker assimilates to the vowel of the pronoun and the relative marker cliticises to the pronoun. (5.22a-c) give examples of object relatives beginning with a pronoun (for masculine, feminine and plural gender nouns respectively), while (5.23) gives an example of an oblique relative clause beginning with a pronoun.

(5.22) a. **mi:te** [**jé-été** ka ɪcí íŋí já] akú ójǒ
 ox REL.M-1SG DCM see 3M REL.M 3M.eat grass

‘The ox which I see is eating grass’

b. **kɔ:kóɾó** [**mé-été** ka ɪcí ó:kó mó] m-ɔǰǒ meréké
 hen REL.F-1SG DCM see 3F REL.F 3F-peck sesame

‘The hen which I see is eating sesame’

c. **kanǰá** [**né-été** ɪcí é:ké nó] k-óǰɔŋkɔɾɔ 3P-be.long
 k.o.spear REL.P-1SG DCM see 3P REL.P

‘The spear which I see is long’

(5.23) **tɪŋkéré** [**né-été** ka áfúŋ:ó kíté nó] k-íβótóβotɔ
 bed REL.P-1SG DCM sleep there REL.P 3P-be.soft

‘The bed on which I sleep is soft’

(5.24) **Oogo mafa** ka **tumma** [tanno oono ka tatirna a kafaafa
 ɔ:kɔ m-afa ka tum:a ta-nɔ ɔnɔ ka t-atirna a kafa:fa
 3F 3F-keep LOC words OBL-REL.P 3F DCM INF-tell DAT fathers
 mangnga no]
 ma aŋ:a nɔ
 of 1PL.INCL REL.P

‘He has kept the promise he made to our fathers’ (LUKE 1.54)

5.3.1 Relative clauses modifying Peripheral Arguments

When the noun modified by a relative clause is not a core argument of the main verb, this is once again marked by the addition of *t-* before the clause-initial relative marker. This is true for both subject relatives (5.25) and non-subject relatives (5.26).

(5.25) **Mana** 'bangnga ma kadu [tanno iri'ba oono no]
 m-ana βaŋ:a ma katu ta-na iriβa a-ɔnɔ nɔ
 3F-have mercy of people OBL-REL.P fear DAT-3F REL.P

‘He has mercy on those who fear Him.’ (LUKE 1.50)

- (5.26) Kussu aaka tamma ka lingko [tanno kafaafa ma aaka ka
 k-ussu a:ka t-am:a ka liŋkɔ **ta-na** kafaafa ma a:ka ka
 P-know 2PL INF-accept LOC work **OBL-REL.P** fathers of 2PL DCM
 takalingko no]
 t-ak-aliŋkɔ **nɔ**
 INF-PAST-do **REL.P**

‘You admit you approve of what your ancestors did’ (LUKE 11.48)

5.3.2 Relative markers as Pronouns

Relative clauses may occur without an overt head noun, in which case the relative marker can be considered to have a pronominal reading.

- (5.27) a ya adini atene ka immi kateene ya
 a **ja** atini -tene ka im:i kate:ne **ja**
 SUBJ **REL.M-** plant -PASS LOC thorns inside **REL.M**

‘The ones which fell among thorns.’ (MAT 13.22)

5.3.3 Adjectives

In Katcha adjectives do not form a separate grammatical category, but are a type of verb. There is some evidence of a slight morphological distinction between adjectival verbs and more prototypical verbs (an additional morpheme marking semantic plural in the case of adjectives), but with regard to agreement, adjectives show normal verbal morphology and behave in the same way as any other intransitive verb.

When used predicatively as in (5.28-5.30b), adjectives take the usual verbal subject agreement prefixes (cf 5.28-5.30a).

- (5.28) a. mi:te **ø-akú** **ʒ:jó**
 ox **3M-eat** grass
 ‘The ox is eating grass’
 b. mi:te **ø-ama:la**
 ox **3M-be.brown**
 ‘The ox is brown’

- (5.29) a. **kɪbé m-akú ʒ:jʒ**
 she.goat 3F-eat grass
 ‘The goat is eating grass’
- b. **kɪbé m-ama:la**
 she.goat 3F-be.brown
 ‘The goat is brown’

- (5.30) a. **kɪbɪ-mí k-akú ʒ:jʒ**
 she.goat-PL 3P-eat grass
 ‘The goats are eating grass’
- b. **kɪbɪ-mí k-ak-amá:la**
 she.goat-PL 3P-PL-be.brown
 ‘The goats are brown’

When used attributively, adjectives occur in a (subject) relative clause, as would any other intransitive verb:

- (5.31) **ɲɔɔɲɔɔɔ [j-ʒʒɲɲkɔɔ já] ama:la**
 k.o.spear REL.M-be.long REL.M 3M.be.brown
 ‘The long spear is brown’

- (5.32) **tɔɔ [m-áɔɲkúɲɔ mɔ] m-ama:la**
 gourd REL.F-empty REL.F 3F.be.brown
 ‘The empty gourd is brown’

- (5.33) **kanʒá [n-ʒʒɲɲkɔɔ nɔ] k-ama:la**
 k.o.spear REL.P-be.long REL.P 3P-be.brown
 ‘The long spear is brown’

As with any other subject relative clause, when the modified noun is not a core argument of the verb, this is marked by the addition of *t-* before the clause-initial relative marker:

- (5.34) **aʒa n-afúɲɲɔ ká tɲkéré [tá-n-ábótʒɔtɔ nɔ]**
 1SG 1SG-sleep LOC bed OBL-REL.P-be.soft REL.P
 ‘I sleep on a soft bed’

5.4 A unified analysis for nominal modifiers

Assuming attributive adjectives to be relative clauses, there are three kinds of nominal modifiers in Katcha: demonstratives, possessive noun phrases and relative clauses. These are indicated by the presence of the morphemes listed in table 5.2. Aside from the medial and distal demonstratives, these three types of nominal modifiers are clearly all related. All three are introduced by similar morphemes showing agreement with the head noun. It is worth considering the nature of this relation in more detail and in particular, the question of whether the proximal demonstrative, the possessive marker and the relative marker are all the same morpheme and, if so, how this should be characterised.

Stevenson (1941) takes a conservative descriptive line, taking the common element to be just the *j-/m-/n-* gender agreement prefixes, which then attach to different morphemes. Thus, in his view, these gender prefixes may attach to the demonstrative stem *-a/-ɔ* (Stevenson 1941:58), to the ‘genitive particle’ *-a* (Stevenson 1941:47) and ‘possessive pronouns’ *e:te*, etc. (Stevenson 1941:48), and to verbs (Stevenson 1941:68). Although Stevenson does not explicitly state it as such, this approach essentially analyses the *j-/m-/n-* prefixes as a general marker of nominal modifiers. However, whilst it seems correct to a large extent, such an analysis does not go far enough in that it does not incorporate the medial and demonstrative pronouns, which agree in gender with the head noun, yet do not carry these prefixes. This fact is significant for the hypothesis that *j-/m-/n-* are prefixes which mark modification generally, because whilst the existence of a ‘general modification’ marker does not preclude the existence of other constructions, it is surprising to find that the possessives and relatives pattern with the proximal demonstrative, while the medial and distal demonstratives do not. The remainder of this chapter proposes an alternative analysis which unifies the account of the three types of nominal modifier, fits the overall patterns of Katcha morphosyntax, and accounts for the medial and distal demonstratives. The proposed analysis is that all nominal modifiers in Katcha are headed by an initial demonstrative pronoun.

Table 5.2: Nominal modifiers in Katcha — List

	Demonstratives			Possessive Marker	Relative Marker	
	Prox.	Med.	Dist.		clause-initial	clause-final
Masculine	já	ékê	ín:î	já	já	já
Feminine	mó	ɔkô	um:û	má	má	mó
Plural	nó	ékê	ín:î	ná	ná	nó

5.4.1 The unity of nominal modifiers — Phonological evidence

There is evidence to suggest that the *já/má/ná* found with possessors and at the beginning of relative clauses is a phonologically conditioned allomorph of the *já/mó/nó* found in demonstrative noun phrases and at the end of relative clauses.

There are notable phonetic differences between *já/má/ná* and *já/mó/nó*. The former generally have a shorter, more neutral vowel, which is often subject to vowel elision and harmony, both of which are very common general processes in Katcha. The tone of this vowel appears to be high but these morphemes are frequently run together with the following word (often eliding the vowel) such that it can be hard to establish tone accurately. The vowel also has a tendency to harmonise to some degree with the following vowel. So although generally written as <ya, ma, na>, pronunciation may vary according to the vowel that follows (eg. [jí, mí, ní] or [jǒ, mó, nó]). The vowel harmony is not always as complete as in some other contexts (the vowel harmony between noun stem and number prefix, for example), presumably due to the word boundary: /*má kúkkô*/ does often sound closer to [mǒgúkô] than to [mógúkô] or [mǒgúkô]. It can be difficult to distinguish the exact vowel quality though, because the vowel is often very short or, as noted above, elided altogether in the case of a following vowel. This is in marked contrast with the *já/mó/nó* morphemes which have slightly longer, more pronounced vowels. They are much less prone to elision before a vowel and carry an *exceptionally* high tone.

Significantly, the syntactic distribution of these forms is complementary within the noun phrase: *já/má/ná* (possessive marker and clause-initial relative marker) occurs at the beginning of a nominal modifier; *já/mó/nó* (demonstrative and clause-final relative marker) occurs only at the end. There is a strong argument therefore that the phonetic differences are to do with phrasal intonation. The *já/mó/nó* marker occurs at the end of the noun phrase; importantly, it generally occurs before a pause. This, combined with the extra-high tone, serves to give it a notable emphasis. In the case of the demonstratives, there is naturally something contrastive about their semantics, and it would seem to be this that is reflected in the intonation. Relative clauses are generally parenthetical; again the intonation seems to reflect this with a higher than usual tone on the clause-final relative marker and a pause before continuing with the matrix clause. In contrast, the *já/má/ná* marker occurs at the beginning of the modifier and consequently does not carry the same contrastive or parenthetical intonation. It behaves like most short non-lexical Katcha words (eg. prepositions): undergoing vowel harmony, elision, etc.

Evidence that the difference between *já/má/ná* and *já/mó/nó* is primarily intonational can be seen in example (5.35), where the demonstrative morpheme *nó* occurs at the end of a left-dislocated object noun phrase *a túm:á nó*, ‘these words’:

(5.35) a túm:á nój aʔa n-asá:sa t-atirna á:ká
 TOP words DEM.P 1SG 1SG-want INF-tell 2PL

‘I want to tell you these words’ (TEACH:1.48)

In this case, there is no contrastive intonation or pause and the vowel of the demonstrative is elided before the pronoun: [ǎdúm:áná:]. Thus this is an example of demonstrative *nój* being realised as *n-* before a vowel, exactly as the possessive/relative markers *ná* would be, apparently due to the intonational properties of its position in the sentence. Note that (5.35) is *not* an example of a relative marker: the subject pronoun is in the wrong case (nominative rather than oblique), the verb is finite and there is no corresponding clause-final relative marker. All of these indicate that this sentence is made up of a single main clause (in addition to the fact that there is no other candidate for a matrix verb in this sentence). The analysis of this noun phrase as a left-dislocated demonstrative phrase also concurs with the translation provided by Katcha speakers and the spelling suggested by them (<no> rather than <na>).

Some additional evidence that *já/má/ná* and *já/mój/nój* are allomorphs comes from the spelling conventions used in literature written by Katcha speakers (in particular, the draft Katcha New Testament). When possessive and clause-initial relative markers (*já/má/ná*) occur with the oblique argument marker *t-* they are consistently written as <tiya, tamo, tano>³ even when preceding a vowel. When these markers occur without the *t-* and precede a vowel, they are consistently written as a prefix <y-/m-/n->. When they occur without the *t-* but precede a consonant, they are generally written as <ya/ma/na>. Thus the same morpheme may be spelled three ways according to context. Significantly, spellings with <o> and spellings with <a> are both used in different contexts for what is clearly the same morpheme, despite the fact that this spelling alternation does not reflect the phonetic realisation. Spelling habits should certainly not be taken as conclusive (it may simply be that certain spellings are becoming conventionalised in the vernacular literature), but they may be extra evidence that Katcha speakers do not distinguish between these morphemes.

³The team also sometimes write <tammo> and <tanno>, but I am not convinced the consonant is long.

5.4.2 Nominal modifiers as demonstrative pronouns — Morphosyntactic evidence.

Having noted the evidence that *já/má/ná* and *já/mó/nó* are phonologically conditioned allomorphs, the question arises as to the nature of this morpheme. Based on the morphosyntactic properties presented in sections 5.1-5.3, this section argues that it is in fact the proximal demonstrative pronoun, acting as head of the modifier phrase. A possible alternative answer is that the *já/mó/nó* morpheme is simply a general marker of modification. The latter suggestion does not fit the Katcha data as well as the analysis proposed here but it should be noted that the two analyses are related, and in section 5.5.2 it is speculated that Katcha may be in the midst of a move from one to the other.

It was demonstrated in sections 5.1-5.3 that demonstratives, possessive noun phrases and relative clauses all display the same morphosyntactic properties with respect to gender agreement, the modification of peripheral arguments and pronominal use. Some relevant examples are repeated below (5.36-5.44).⁴

Gender agreement

(5.36), (5.37) and (5.38) demonstrate that gender agreement is exhibited by demonstratives, possessives and relatives, respectively.

- (5.36) a. **omudí já** **adí:la**
 man **PROX.M** 3M.good
 ‘That man is good’ (ADVICE:1.1)
- b. **akká mó** **tá:lɔ m-ádi:lá dɔ**
 woman **PROX.F** NEG 3F-good very
 ‘This woman is not good at all’ (ADVICE:1.32)
- c. **katú nó** **k-adí:lá**
 people **PROX.P** 3P-good
 ‘Those people are good’ (ADVICE:1.3)
- (5.37) a. **ᵑᵑᵑᵑᵑᵑᵑᵑ já** **kúkkô**
 k.o.spear **POSS.M** Kuku
 ‘Kuku’s spear’

⁴These examples are rearranged slightly and given new numbering to make the presentation clearer, but they are all taken from the discussion above. (5.1→5.36, 5.10→5.37, 5.18→5.38, 5.5→5.39a, 5.6a→5.39b, 5.14→5.40a, 5.15a→5.40b, 5.25→5.41, 5.9a→5.42, 5.17→5.43, 5.27→5.44)

- b. tɔɔ **má** kókkô
 gourd POSS.F Kuku
 ‘Kuku’s gourd’
- c. kânṭá **ná** kókkô
 k.o.spear POSS.P Kuku
 ‘Kuku’s spear’

- (5.38) a. mi:te [j-akú ó:jó **já**] ama:la
 ox REL.M-eat grass REL.M 3M.be.brown
 ‘The ox which is eating grass is brown’
- b. kibe [m-akú ó:jó **mó**] m-ama:la
 she.goat REL.F-eat grass REL.F 3F-be.brown
 ‘The goat which is eating grass is brown’
- c. kibi-mí [n-akú ó:jó **nó**] k-ak-ama:la
 she.goat-PL REL.P-eat grass REL.P 3P-PL-be.brown
 ‘The goats which are eating grass are brown’

Behaviour with non-core arguments

(5.39b), (5.40b) and (5.41) demonstrate that demonstratives, possessives and relatives respectively are marked with the *t-* prefix when they modify a noun which is not a core argument of the verb.

- (5.39) a. aʔa n-asá:sá [tɪŋkere **nó**]
 1SG 1SG-want bed PROX.P
 ‘I want this bed’
- b. aʔa n-afúŋó [ká tɪŋkére **tá-nó**]
 1SG 1SG-sleep LOC bed OBL-PROX.P
 ‘I sleep on this bed’
- (5.40) a. aʔa n-asá:sá [páppá **já** kókkô]
 1SG 1SG-want father POSS.M Kuku
 ‘I want Kuku’s father’
- b. aʔa n-asá:sá **dí** [já páppá **tí-já** kókkô]
 1SG 1SG-want house POSS.M father OBL-POSS.M Kuku
 ‘I want Kuku’s father’s house’

- (5.41) Mana 'bangnga ma kadu [tanno iri'ba oono no]
 m-ana baŋ:a ma katu ta-na iri'ba a-ɔno no
 3F-have mercy of people OBL-REL.P fear DAT-3F REL.P
 'He has mercy on those who fear Him.' (LUKE 1.50)

Pronominal use

(5.42), (5.43) and (5.44) demonstrate that demonstratives, possessives and relatives respectively may occur without an explicitly realised head noun, in which case they act as pronouns.

- (5.42) já
 PROX.M
 'This one'

- (5.43) Na hamada niile
 na hamata ni:le
 POSS.P Hamad Nile
 'Those of Hamad Nile (i.e. Hamad Nile's people/family)' (SPLA:7)

- (5.44) A ya adini atene ka immi kateene ya
 a ja atini -tene ka im:i kate:ne ja
 SUBJ REL.M- plant -PASS LOC thorns inside REL.M
 'The ones which fell among thorns.' (MAT 13.22)

Medial and Distal Pronouns

The data in (5.36-5.44) demonstrate that relative markers, possessive markers and proximal demonstratives all behave in the same way. This is not surprising, as section 5.4.1 has already shown evidence that they are all the same morpheme. However, it is important to note that the medial and distal demonstratives, which are clearly unrelated morphemes, also show exactly the same properties. Some relevant examples are repeated below (5.45-5.48).⁵

⁵Again, these examples are rearranged and renumbered for clarity. (5.2b→5.45a, 5.3b→5.45b, 5.4b→5.45c, 5.2c→5.46a, 5.3c→5.46b, 5.4c→5.46c, 5.6b,c→5.47, 5.9b,c→5.48)

Gender agreement

(5.45) and (5.46) demonstrate that gender agreement is exhibited by the medial and distal demonstratives respectively.

- (5.45) a. aʔa n-asá:sá ɲɔɲɔɲɔ́ **ékê**
 1SG 1SG-want k.o.spear MED.M/P
 ‘I want that spear’
 b. aʔa n-asá:sá tɔɔ **ɔkɔ́**
 1SG 1SG-want gourd MED.F
 ‘I want that gourd’
 c. aʔa n-asá:sá kânɲá **ékê**
 1SG 1SG-want k.o.spear MED.M/P
 ‘I want that spear’

- (5.46) a. aʔa n-asá:sá ɲɔɲɔɲɔ́ **íní**
 1SG 1SG-want k.o.spear DIST.M/P
 ‘I want that spear (way over there)’
 b. aʔa n-asá:sá tɔɔ **um:ú**
 1SG 1SG-want gourd DIST.F
 ‘I want that gourd (way over there)’
 c. aʔa n-asá:sá kânɲá **íní**
 1SG 1SG-want k.o.spear DIST.M/P
 ‘I want that spear (way over there)’

Behaviour with non-core arguments

(5.47a) and (5.47b) demonstrate that medial and distal demonstratives respectively are marked with the *t-* prefix when they modify a noun which is not a core argument of the verb.

- (5.47) a. aʔa n-afúɲɔ́ [ká ɲɲkéré **t-ékê**]
 1SG 1SG-sleep LOC bed OBL-MED.M/P
 ‘I sleep on that bed’
 b. aʔa n-afúɲɔ́ [ká ɲɲkéré **t-íní**]
 1SG 1SG-sleep LOC bed OBL-DIST.M/P
 ‘I sleep on that bed (way over there)’

Pronominal use

(5.48a) and (5.48b) demonstrate that medial and distal demonstratives respectively may occur without an explicitly realised head noun, in which case they act as pronouns.

- (5.48) a. **ékê**
 MED.M
 ‘That one’
- b. **ínî**
 DIST.M
 ‘That one (way over there)’

The medial and distal demonstratives behave exactly like all other modifiers, except that they do not take *j-/m-/n-* ‘prefixes’. This concurs with the evidence presented in the preceding sections that *j-/m-/n-* are not prefixes which attach to modifiers, but are themselves the modifiers. Moreover, the only nominal modifiers which are not of the form *já/mó/nó* are the medial and distal demonstratives. If the *já/mó/nó* morpheme which introduces a possessive noun phrase or a relative clause is the proximal demonstrative, then there is a unified analysis which accounts for all examples: nouns in Katcha may be modified only by demonstratives, or by phrases headed by demonstratives.

As mentioned in section 5.1.2, there is evidence that demonstratives should be considered pronouns rather than determiners; in fact, there are no determiners in Katcha. Since there are also no adjectives, Katcha has no modifiers that are unambiguously internal to the noun phrase. This suggests that lexical nouns form complete noun phrases and cannot be modified directly, from within the noun phrase. That is to say, a noun phrase (in Minimalist terms, a DP) may be made up *only* of a noun. The demonstrative is a pronoun which can be considered to stand in apposition with the noun, taking its reference anaphorically. (5.2') & (5.6c') repeat some of the examples given earlier, with an altered free translation which is more reflective of this analysis:

- (5.2') **aʔa n-asá:sá ɲɔɲɔɲɔ́ já**
 1SG 1SG-want k.o.spear **PROX.M**
 ‘I want a spear, this one’
- (5.6c') **aʔa n-afúŋó [ká ɲɲkéré t-ínî]**
 1SG 1SG-sleep LOC bed **OBL-DIST.P**
 ‘I sleep on a bed, that one (way over there)’

In the case of possessives and relative clauses, the same analysis can be put forward. The anaphorically resolved demonstrative heads the modifier phrase which is appositional to

		Proximal		Medial	Distal
		(Possessive)	(Relative)		
Masculine	já	já + noun	já + VP	ékê	ínnî
Feminine	mó	mó + noun	mó + VP	ɔkô	ummû
Plural	nó	nó + noun	nó + VP	ékê	ínnî

Table 5.3: Nominal modifiers in Katcha — Analysis

the noun it modifies. It is then the nature of the appositional phrase which determines the modifier's interpretation, as summarised in table 5.3.

When the demonstrative is followed by a noun, it is interpreted with a possessive meaning. (5.10c'), (5.11') & (5.17') repeat some of the examples given earlier, with glosses and free translations more reflective of this analysis. Note that in the case of (5.17') the free translation does not actually require to be changed at all from that originally given in (5.17):

(5.10c') **kânjá ná kúkkô**
 k.o.spear **PROX.P** Kuku
 'a spear, this one of Kuku's'

(5.11') **aʔa n-asá:sá dī jé-été**
 1SG 1SG-want house **PROX.M-1SG**
 'I want a house, this one of mine'

(5.17') **Na hamada nīle**
na hamata ni:le
PROX.P Hamad Nile
 'Those of Hamad Nile' (SPLA:7)

When the demonstrative is followed by a verb, it acts as its subject, resulting in a subject relative clause. The demonstrative pronoun replaces the subject agreement marker in this case. If the subject agreement marker is thought of as an incorporated pronoun (as suggested by Norton (2008b)), then this is entirely natural. One pronoun, the demonstrative, has simply taken the place of another, the subject marker (5.18'):

(5.18') **mi:te [j-akú ó:jó já] ama:la**
 ox **PROX.M-eat** grass **REL.M** 3M.be.brown
 'An ox, this one eating grass, is brown'

In the case of non-subject relatives, Stevenson (1941:68) notes that they are formed in Katcha using a construction parallel to that used for possessives. The relative clause is non-finite or nominalised, as indicated by the dependent clause marker *ka* (and also sometimes the infinitive marker *t-*). Thus non-subject relatives can be seen as a ‘possessive’ relation holding between two ‘nominals’: the head noun, and the event described by the relative clause. (5.21′) & (5.22b′) repeat examples given earlier, with glosses and free translations more reflective of this analysis.

(5.21′) aʔa n-ɪcí rá:ká [já fí:jɔ ka t-akóri kite já]
 1SG 1SG-see field PROX.M cow DCM INF-eat there REL.M
 ‘I see a field, this one of the cow’s eating grass in it’

(5.22b′) kɔ:kórɔ [mé-été ka ɪcí ʒ:kó mó] m-ɔʔɔ meréké
 hen PROX.F-1SG DCM see 3F REL.F 3F-peck sesame
 ‘A hen, this one of my seeing it, is eating sesame’

It should be noted that the morpheme at the end of a relative clause does not quite fit the analysis as explained here. It does not seem to be appositional to any other nouns and does not take a *t-* prefix when within an oblique phrase. Both of these facts follow from its position at the end of the clause in that it does not directly follow the modified noun, and the *t-* prefix attaches to the clause-initial morpheme. Note also that its status is somewhat unclear. Stevenson (1956-57:63-64) states that it marks definiteness, implying that it is optional. If this were true, the analysis should be straightforward, confirming the morpheme to be a demonstrative. On the other hand, Gilley (2013:502) suggests that it is obligatory for masculine nouns, optional for feminine, and unattested for plural, which would make the analysis somewhat trickier. Neither of these descriptions quite match my data: the relative clause-final marker seems to be present fairly consistently. Interestingly though, in chapter 10 a Dynamic Syntax analysis of Katcha relative clauses is given which assumes the clause-final relative marker to be a demonstrative. On the basis of that assumption it transpires that the role of the final morpheme is to contribute definiteness; in other words, Stevenson is predicted to be correct.

The analysis that nominal modifiers comprise noun phrases in apposition, gets some extra support from the wider tendencies of Katcha syntax, in that Katcha has a tendency also to put verbs and clauses in apposition. Thus, while (5.49) is a perfectly grammatical way of expressing the proposition ‘Kuku is a tall man’, (5.50) is equally grammatical, and probably more common.

(5.49) kókkô omudí j-ḥḥkə̀rə́ já
 Kuku man PROX.M-be.long REL.M
 ‘Kuku is a man, this one who is tall’

(5.50) kókkô omudí ḥḥkə̀rə́
 Kuku man 3M.be.long
 ‘Kuku is a man, he is tall’

Overall, then, the analysis of nominal modifiers as (phrases headed by) demonstrative pronouns in apposition to the modified noun is to be favoured. This analysis allows the medial and distal demonstratives to be treated alongside the proximal demonstrative. It is not strange that the medial and distal demonstratives do not carry the *j-/m-/n-* prefixes; the ‘prefixes’ are in fact the proximal demonstrative. The analysis proposed here also fits both the simple structure of Katcha noun phrases (no determiners or adjectives) and the tendency of Katcha to also put verb phrases in apposition.

5.5 Cross-linguistic connections

A common area of cross-linguistic variation is what might be called ‘head-alignment’ vs ‘dependant-alignment’. The morphosyntax of some languages marks or otherwise focuses on the heads of particular constructions, whilst in other languages the focus is on the dependant. In the case of possessive noun phrases, for example, the head noun may be marked morphologically to indicate that it is possessed or the dependant noun may be marked morphologically to indicate that it is a possessor. The description and analysis of Katcha nominal modifiers presented here shows them to be strongly head-aligned. Modifiers are construed as appositional phrases marked by the presence of a demonstrative pronoun. A key aspect of this analysis is the fact that the demonstrative is strongly connected to the head noun: its morphological form is controlled by the head noun by means of gender agreement, its syntactic position is immediately following the head noun, and its semantic referent is of course identified with that of the head noun. The features of the demonstrative are very much aligned with the head, rather than with the modifier.

Noting the fact that Katcha nominal modifiers are strongly head-aligned allows a point of comparison with other languages. The final part of this chapter therefore briefly indicates how Katcha may fit with previously proposed typologies for nominal modifiers. In the case of relative clauses (section 5.5.1), it is suggested that the demonstrative pronoun does not act as a relative pronoun or as a relative complementizer, but as a ‘relative marker’ as outlined by de Vries (2002). In the case of possessives (section 5.5.2), it is suggested that there is a connection between the Katcha data and the notion

of construct as defined for African languages by Andersen (2002) and Creissels (2009). The link between these constructions is that there is a focus on the head noun: relative markers, as defined by de Vries (2002), are only attested in languages with post-nominal relative clauses and show agreement with the head noun; construct states, as defined by Andersen (2002), are only attested in languages with post-nominal possessors and show morphological marking on the head. The analysis of Katcha nominal modifiers presented here therefore fits quite closely with what might be expected typologically.

5.5.1 Relatives

Given the analysis of *já/mǎ/nǎ* as a demonstrative pronoun, it might be assumed that in a relative clause it would play the role of a relative pronoun. From a typological point of view, this would be distinctly surprising. Cross-linguistically, relative pronouns are an uncommon way of encoding relativization, and are largely non-existent in Africa. Of the 166 languages whose subject-relativization strategies are surveyed in WALS (Comrie and Kuteva 2013a), only 12 make use of relative pronouns. Of those, 11 are European languages and the twelfth is North American. Furthermore, the majority of relative pronouns are derived from interrogative morphemes; it is extremely rare for a demonstrative to be the source of a relative pronoun. This contrasts with the case of invariant relative complementizers, which often derive from demonstratives (de Vries 2002; Gisborne and Truswell 2016). A demonstrative pronoun acting as a relative pronoun is therefore not something we would expect to find in Katcha.

In fact, there are ways in which the demonstrative head of a relative clause in Katcha does *not* act as a classic relative pronoun. The definition of the ‘relative pronoun strategy’ used in WALS is that ‘the position relativized is indicated inside the relative clause by means of a clause-initial pronominal element, and this pronominal element is case-marked (by case or by an adposition) to indicate the role of the head noun within the relative clause’ (Comrie and Kuteva 2013a). This is contrasted with the ‘gap strategy’ where ‘there is no overt case-marked reference to the head noun within the relative clause’ (Comrie and Kuteva 2013a). Case-marking is therefore central to Comrie and Kuteva’s definition. In section 6.6, it will be suggested that case on Katcha pronouns may be indicated by tone. Since the tone on the demonstrative morpheme appears to remain consistently high, this suggests that there is no case marking. So by this definition, Katcha uses a ‘gap strategy’ for subject relatives, as would be expected given its genetic and geographical location. Also, note that non-subject relative clauses often utilise a resumptive pronoun (section 5.3). The internal syntax of non-subject relatives is yet to be investigated (pending a study of dependent and non-finite clauses), but a couple of implications can be drawn from this fact. Firstly, as with the gap strategy for subject relatives, a resumptive strategy for non-subject relatives is not out of place genetically or geographically (Comrie and Kuteva 2013b). Secondly, the

presence of a resumptive implies that it is this rather than the demonstrative which encodes ‘the syntactic-semantic role of the head noun in the relative clause’ (Comrie and Kuteva 2013c). By these definitions then, the demonstrative is not a relative pronoun in the classic sense.

A better characterisation of the role of the demonstrative in Katcha relative clauses is that it is a ‘relative marker’ (RM) in the sense described by de Vries (2002). Following Lehman (1984), de Vries argues that there are three possible functions of a relative element: Subordination, Attribution and Gap Construction (de Vries 2002:155), and that an RM is a ‘type of relative particle that has just the Attribution function’ (de Vries 2002:170). That is, an RM encodes the fact that the relative clause is attributed to the head. There are four distinctive characteristics of relative markers, all of which are true for Katcha (de Vries 2002:174-176):

- i) RMs are attested only in post-nominal relative clauses.
- ii) RMs occupy the first position in the relative clause.
- iii) RMs show at least some overt evidence of agreement with the head noun.
- iv) RMs are predominantly found in Afro-Asiatic and Niger-Congo languages.

When used in a relative clause, demonstrative *já/mó/nó* is a relative marker encoding the function of Attribution, rather than a relative pronoun encoding Gap Construction. Gap Construction is concerned with the role of the relativised element within the relative clause and is therefore marked by a pronoun (relative or resumptive) whose case marks its role in the subordinate clause; Attribution is concerned with the relationship of the relative clause to the head and is therefore ‘indicated by ϕ -feature agreement with the head – i.e. person, number, gender, class (+ ϕ , in short) – and placement at the sentence border’ (de Vries 2002:157). To put this another way, relative pronouns of the sort found in Europe are ‘dependant-focused’ and therefore exhibit the case required by the dependant, whilst relative markers of the sort found in Africa are ‘head-focused’ and therefore agree with the head.

5.5.2 Possessives

As briefly mentioned at the start of section 5.4, Stevenson (1941) considers *j-/m-/n-* to be prefixes which attach to various modifiers. Essentially, this has the effect of analysing them as marking modification generally. Such marking is not uncommon in African languages, especially when including constructions which have been analysed as forms of the ‘construct state’. It has been argued by Andersen (2002) and particularly by Creissels (2009) that the notions of ‘construct state’ and ‘construct form’ commonly found in Semitic may be extended to other languages in the Afro-Asiatic, Nilo-Saharan

and Niger-Congo families. These authors define the ‘construct’ as a morphological form of a noun encoding the fact that it is modified, in other words, a general marker of modification:

In a complex noun phrase consisting of a head and a modifier, the modifier normally follows the head. Before most types of modifiers, the head has a form that is different from the absolutive form [...] In Semitic linguistics it is referred to as “construct state” (Andersen 2002:13).

An example of construct state from Khartoum Arabic is given in (5.51). The construct (b) is marked syntactically with the definite article *al* changing position within the noun phrase, and the head is marked morphologically with the addition of the suffix *-t*.

- (5.51) a. **al guf:a** [Khartoum Arabic]
 DEF basket
 ‘the basket’
 b. **guf:a-t al walad**
 basket-CSTR.F DEF boy
 ‘the boy’s basket’ (Persson and Persson 1984:79)

In the case of Katcha, the noun does not change form when modified. So by the definitions given above, Katcha does *not* have a construct form. There is no evidence that the modifier-initial morpheme should be considered to be a ‘morphological marker’ of the head noun; it is a separate demonstrative pronoun and not a suffix. Nevertheless, the demonstrative is strongly aligned with the head noun in the ways mentioned above: its morphological form is controlled by the noun by means of gender agreement, its syntactic position generally is immediately beside the noun, and of course its semantic reference is identical with that of the noun. It might be argued that what we have here is a *syntactic* construct (to use the language of the Semitic tradition, a ‘construct state’), but not a *morphological* construct (a ‘construct form’).

As such, it might be said that the syntax of the Katcha noun phrase is only one stage removed from a construct form. The demonstrative pronoun and the noun it modifies are morphologically, syntactically and semantically connected, but there is no phonological connection. From the point of view of language change, it is easy to imagine Katcha developing such a construct form of the noun by the cliticisation of the demonstrative to it. And in fact, there are languages where just such a move appears to have taken place.

As part of his survey of construct forms in African languages, Creissels (2009) describes Hausa (Afroasiatic, Chadic) as having two synonymous genitive constructions, a construct form (5.52a), and a non-construct form (5.52b):

- | | | | | |
|--------|----|---------------|--------------------------|---------------------|
| (5.52) | a. | kàre-n | Daudà (cf. kàree ‘dog’) | [Hausa] |
| | | dog-CSTR.SG.M | Dauda | |
| | | ‘Dauda’s dog’ | | (Creissels 2009:77) |
| | b. | kàree na | Daudà | [Hausa] |
| | | dog | that one (SG.M) of Dauda | |
| | | ‘Dauda’s dog’ | | (Creissels 2009:77) |

As Creissels points out, the construct form in (a) clearly results from the cliticisation of the pronoun in (b). Strikingly, the non-construct Hausa construction (5.52b) appears to be entirely parallel to the Katcha equivalent. Where Hausa has both construct and pronominal strategies for nominal modification, Katcha has not (yet) developed a construct form and uses only the pronominal strategy.

5.5.3 Summary

The analysis presented in this chapter is that nominal modifiers are appositional phrases headed by a form of the demonstrative pronoun. This is a somewhat unorthodox proposal but in fact it fits closely, though not exactly, with analyses of nominal modifiers which have been argued to be typologically typical in the African context.

In the case of relative clauses, the features of the demonstrative, such as the fact it agrees with the gender of the head noun and not with the case of its role within the modifying clause, suggest that it acts as a relative marker and not as a relative pronoun. This would be expected in Afro-Asiatic and Niger-Congo languages, but arguably goes against the description given in section 5.4.2, where the demonstrative is described as a pronoun acting as the subject of the relative clause. However, the relativized element in any relative clause has two roles; it is shared between the matrix clause and the subordinate clause. The fact that a relative marker is marked for agreement with the head noun and not for subordinate clause case does not prove that it is not an argument of the subordinate clause, only that its relationship to the head is morphologically more significant than its role within the modifier. That is, the ‘Attribution’ function is more significant than the ‘Gap Construction’ function and the morphology is therefore head-aligned rather than dependant-aligned.

In the case of possessive noun phrases, the Katcha construction is very reminiscent of a construct marker and it was noted in section 5.5.2 how a genuine construct form might easily develop from it. As in the case of relative clauses a key part of this analysis is the fact that the morphosyntactic and semantic features of the demonstrative are head-aligned.

Both the constructions discussed here — relative clauses using relative markers and possessive phrases using construct markers — are relatively well attested in Africa. The analysis of Katcha nominal modifiers proposed in this chapter was intended primarily

to give a unified account of the *já/mó/nó* morpheme, not to consider where Katcha fits in the typology of relative or possessive constructions. It is therefore notable that the proposed analysis, of appositional phrases headed by a demonstrative pronoun, leads to constructions which quite closely resemble these relatively typical constructions. However, in neither case does the analysis of *já/mó/nó* as a demonstrative pronoun produce a fully prototypical example of these constructions. Rather, this analysis posits a single construction for all Katcha nominal modifiers which has the clear potential to provide a source for grammaticalization of the demonstrative pronoun into a relative marker on the one hand and a construct marker on the other.

5.6 Conclusion

There are, phonetically, five sets of morphemes marking nominal modifiers in Katcha, namely *j-/m-/n-*, *já/má/ná*, *já/mó/nó*, *ékê/ɔkɔ* and *ín:í/um:ú*. These serve various functions, marking proximal, medial and distal demonstratives, possessives, subject relative clauses and non-subject relative clauses. As implied by table 5.2, the correlation between the surface phonetic form of the morpheme and its syntactic function is not completely clear. To reduce this mix of forms and functions to something more systematic is obviously desirable from the point of view of analytical elegance. However, it is also desirable for data-driven reasons: with the exception of the medial and distal demonstrative pronouns, there is considerable uniformity in the form of nominal modifiers and an understanding of how they are related would shed considerable light on the workings of the language.

With regard to the similarities of form, it was argued in section 5.4.1 that there is in fact only one ‘*j/m/n*-style’ morpheme, with the variant pronunciations due to intonation-based allomorphy. This leaves three forms to give an analysis for: *ín:í/um:ú*, *ékê/ɔkɔ* and *já/mó/nó*. The first two of these are uncontroversial, being the distal and medial demonstrative pronouns respectively. The third includes the proximal demonstrative pronoun, but is also used in all other nominal modifiers. One possible analysis of the syntactic function of this latter morpheme is that it simply marks modification generally. However, this does not account for the fact that the medial and distal demonstratives do not exhibit this marking, whereas the proximal demonstrative, along with relative clauses and possessive noun phrases, does. In section 5.4.2 it was therefore argued that a better analysis is to assume that the three forms *já/mó/nó*, *ékê/ɔkɔ* and *ín:í/um:ú* represent the three demonstrative pronouns and that other Katcha nominal modifiers are phrases headed by a demonstrative pronoun. All modifiers stand in a relationship of apposition to the modified noun. This approach allows a unified treatment of the various types of modifier, including the medial and distal demonstratives. It is supported by the fact that there are no words in Katcha

which can be unambiguously categorised as determiners or adjectives; lexical nouns appear to form complete noun phrases which do not allow phrase-internal modification. Nominal modification is therefore achieved by apposition of an external phrase.

Finally, as noted in section 5.5, the analysis adopted here can be placed in a wider context within African linguistics. The demonstrative which heads the appositional modifier shows gender agreement with the head noun, thereby encoding the function of ‘Attribution’ and connecting the modifier with the head. In this way it acts as a relative marker of the type found in Afro-Asiatic and Niger-Congo languages. A prototypical relative marker is not a pronoun and indeed the demonstrative does not show the subordinate clause case marking that would be expected of a relative pronoun. Nonetheless, it was argued in section 5.4.2 that the demonstrative is best considered to be a pronoun. So it is not a fully prototypical relative marker, though it may be in process of being grammaticalized as such. Similarly, the possessive construction in Katcha does not alter the form of the head noun and therefore is not quite an example of the construct state found in many African languages, but it does represent the kind of structure from which such a phenomenon could develop. Construing nominal modifiers as appositional phrases headed by a demonstrative pronoun not only provides a unified analysis of the Katcha data, but also gives an example of one way in which two seemingly unrelated, typically African constructions might derive from a common source.

Chapter 6

Pronouns and Prepositions

Introduction

This chapter presents a description of personal pronouns in Katcha and aims to explain the differences between the various forms. There are two basic sets of pronominal forms, which I label ‘Core’ pronouns and ‘Oblique’ pronouns, and these are described in section 6.1. The choice of pronominal form is dependent on the role it plays in the sentence and also, in oblique cases, which preposition it follows. A description of prepositions and similar morphemes, including the pronominal forms they select, is therefore presented in sections 6.2 and 6.3. The following two sections discuss other aspects of the prepositional system, namely the modification of (primarily locative) prepositional phrases by adverbs or further prepositional phrases (section 6.4) and the lexical selection of prepositions by certain verbs (section 6.5). The chapter concludes by returning to the discussion of pronominal forms in section 6.6, where it is suggested that these different forms may be best described as realisations of case. Taking into account evidence from tone alternations and typological universals, it is tentatively concluded that Katcha personal pronouns occur in one of three cases: Nominative, Accusative and Oblique.

6.1 Personal Pronouns

Katcha has two forms of personal pronouns. Stevenson refers to the first of these two sets as the ‘“absolute” or “disjunctive”’ form (Stevenson 1941:51), and states that this is the form required when the pronoun is ‘used in isolation’ (Stevenson 1941:52). He refers to the second set of pronominal forms as the ‘possessive or qualificative’ forms (Stevenson 1941:51), stating that these forms are required when the pronouns are ‘used in conjunction with prepositions’ (Stevenson 1941:53). Waag (2012:6) calls the two sets the ‘object’ form and the ‘location’ form respectively. Given the variety of functions the

pronouns have, as described below, none of the proposed names are fully satisfactory. I will refer to the two sets as ‘Core’ pronouns and ‘Oblique’ pronouns. The reasons for this choice are explained below but, as with previous proposals, these names do not cover the functions of the two sets exactly.

6.1.1 Pronoun Set 1 - ‘Core’ pronouns

The primary function of the first set of pronouns is to express the core arguments of a sentence: the subject and the direct object (i.e. argument roles S, A and P). For this reason, this set may be referred to as the Core pronouns. However as will be seen in section 6.2, these forms also appear with certain prepositions, so they do also express some peripheral arguments.

There are eight forms of the core pronouns, listed in (6.1). The 1st and 2nd person pronouns distinguish singular and plural, while in the case of 1st person plural there is a further distinction according to the inclusion or exclusion of the addressee. There are three 3rd person pronouns, distinguishing grammatical gender (Masculine, Feminine and Plural gender).

(6.1) ‘Core’ personal pronouns (tone not marked)

1SG	aʔa	1PL.EXCL	uŋɔ
		1PL.INCL	aŋ:a
2SG	ɔʔɔ	2PL	a:ka
3M	iʔi	3P	e:ke
3F	ɔ:kɔ		

The forms given in (6.1) are the citation forms. In everyday use, however, they are often subject to shortening and/or lenition. The presence of the glottal stop in the 1SG, 2SG and 3M forms is notable as these are the only words in which the glottal stop is attested as a consonant of the language. However, in non-emphatic contexts the glottal stop is frequently dropped and the pronouns realised as /a:/, /ɔ:/ and /i:/ (or even shortened to /a/, etc). Similarly (though less frequently), the 2PL and 3P forms may be realised as /a:/ or /e:/.¹

The pronominal forms in (6.1) are listed without reference to tone. The tone pattern of core pronouns varies and it appears that this variation may be due to the pronoun’s function in the sentence. That is, pronouns seem to be marked tonally for case. Where the pronoun is the subject of its clause, it has a Low-Low melody, as in the second clause of (6.2); where the pronoun is not the subject of its clause, it is more likely to

¹I have no record of an equivalent lenition affecting the 3F form, but this may simply be because this pronoun occurs much less frequently in my data.

have a High-High melody, as in the first clause of (6.2). This is discussed further in section 6.6.

- (6.2) asaasa o'o, namma o'o kini
 asá:sá ʒ:, n-am:a ɔ: k-mí,
 3M.love 2SG, 2SG-agree 2SG LOC-3M
 'he loves you and you agree with him' (ADVICE:1.1)

The core pronoun forms are those used when the pronoun acts as the subject or noun phrase complement of a main verb, both of which are exemplified in (6.2). However, the name 'core' pronouns is perhaps slightly misleading, in that these pronominal forms also occur as the complement of certain prepositions. More detail on this is given in section 6.2.

6.1.2 Pronoun Set 2 - 'Oblique' pronouns

The second set of pronouns *always* occur with prepositions marking non-core arguments. As such, I will refer to this set as the Oblique pronouns. As with the core pronouns, there are eight forms, given in (6.3).

- (6.3) 'Oblique' personal pronouns
- | | | | |
|-----|-----|----------|-----|
| 1SG | eté | 1PL.EXCL | iti |
| | | 1PL.INCL | aca |
| 2SG | utú | 2PL | atá |
| 3M | mí | 3P | ené |
| 3F | ɔnó | | |

6.2 Prepositions

Katcha has a number of morphemes marking oblique argument roles. Stevenson (1941, 1956-57) describes these as prepositions; Waag (2012) refers to them as case markers. There is, of course, 'no necessary universal distinction' (Payne 1997:100) between case markers and prepositions — it is perhaps best to think of them as the ends of a continuum — so either term might be appropriate. However, following Payne's definition of case as being 'imposed by the structure within which the noun phrase occurs' (Payne 1997:100), this chapter will refer to these morphemes as prepositions.²

²This view is revised slightly in chapter 9, where the difference between adpositions and case is considered from a Dynamic Syntax perspective. In the light of the discussion there, it may be that some of the morphemes discussed in this chapter (dative *a* in particular) would be better thought of as case markers rather than prepositions.

With a couple of exceptions, noted in section 6.5, there is no indication that the occurrence of these prepositions is necessitated by the verb.

Prepositions in Katcha can be divided into three types according to the form of pronoun they take as a complement. There are prepositions which require their (pronominal) complement to be a Core pronoun, and there are prepositions which require their complement to be an Oblique pronoun. A third paradigm displays a mixed system, taking Core pronouns in the case of 1st and 2nd person complements, but Oblique pronouns in the case of 3rd person. (Of course, all prepositions may take nominal, as well as pronominal, complements.)

6.2.1 Prepositions requiring core pronouns

Instrumental

The preposition *ana* most commonly has an instrumental interpretation ('with', 'by', 'by means of', etc.) as in (6.4).

- (6.4) *akká mǒ m-uni é:má a kóbbú tí-já*
 woman DEM.F 3F-make things INSTR spoon NON.CORE-DEM.3M
 'The woman is making food using this spoon'

As can be seen in (6.4), before a consonant the instrumental preposition is realised as /a/. Before a vowel it is realised as /an/. It is therefore seldom, if ever, actually realised as /ana/ in natural speech. Nonetheless, this is the form given when the word is elicited in isolation and Katcha writers are consistent in spelling it this way, at least before vowels (before consonants they tend to write it as <a>).

A clear example of the alternation between /a/ before a consonant and /an/ before a vowel is given in (6.5-6.6). These sentences are synonymous, though it should be noted that *á:rabíja* is borrowed from Arabic. A pair of examples using indigenous Katcha vocabulary is therefore given in (6.7) and the semantically somewhat unlikely (6.8).

- (6.5) *kókkú úḡké:ne a terembé:le*
 Kuku 3M.move INSTR car
 'Kuku is going by car'

- (6.6) *kókkú úḡké:ne an á:rabíja*
 Kuku 3M.move INSTR car
 'Kuku is going by car'

- (6.7) kókkó úḡké:ne a muttó
 Kuku 3M.move INSTR horse
 ‘Kuku is going by horse’

- (6.8) kókkó úḡké:ne an úḡku
 Kuku 3M.move INSTR leopard
 ‘Kuku is going by leopard’

The instrumental preposition tends to mark a less active or subordinate participant. Thus in (6.9) (where the complement of *ana* is a human) the sentence implies that Kuku, the sentential subject, is showing the way. If the intended interpretation was one of joint action (‘Kuku is going with me’ i.e. we are going together) the appropriate preposition would be accompaniment *nca* (see section 6.2.3).

- (6.9) kókkó úḡké:ne ana aʔá
 Kuku 3m.move INSTR 1SG
 ‘Kuku is going with me’ (He is showing me the way)

Similarly, when used in conjunction with the verb *ö'dö* ‘come’, *ana* gives the meaning ‘bring’ (6.10-6.11):

- (6.10) kikkiri köö'dö a kisine nja 'bii'bala miini
 k-ikkiri k-o-odo a kisine nca br:bala m:ni
 P-then DCM-PFV-come INSTR donkey ACCOMP child of.it
 ‘They brought the donkey and the colt’ (MAT 21.7)

- (6.11) köö'dö ana alambo eera
 k-o-odo ana alambo era
 3P-PFV-COME INSTR doves 3M.be.two
 ‘They brought a pair of doves.’ (LUK 2.24)

(6.12) illustrates a further use of *ana*, again marking a subordinate participant. (The preposition in the first clause is potentially ambiguous between *ana* and dative *a* (see section 6.2.3), but the occurrence of *ana a'a* in the second clause shows this to be an example of the instrumental.

- (6.12) eema yaada kaküünĩ a nagöre tanno eede
 e:ma ja-ata k-ak-u:ni a naku-re ta-nɔ ete
 things DEM.M-2PL DCM-PFV-do INSTR PL-brother NON.CORE-DEM.P 1SG
 no dhiidhi no, aaga küünĩ ana a'a
 nɔ [ɪ:ɪ nɔ, aka k-u:ni ana aʔa
 DEM.P small DEM.P, 2PL P-do INSTR 1SG
- ‘Whatever you did for one of the least of these brothers of mine, you did for me.’
 (MAT 25.40)

Use with personal pronouns

When the instrumental preposition is followed by a personal pronoun, the pronoun is taken from the core pronouns. In fact, *ana* seems to be the only preposition which takes core pronouns as its complement throughout the entire paradigm, as given in (6.13). The paradigm given in (6.13) was elicited using example (6.9) as a context: ‘Kuku is going with me’, etc.

- (6.13) Instrumental preposition (*ana*) + personal pronouns
- | | | | |
|-----|--------|----------|--------|
| 1SG | anaʔá | 1PL.EXCL | anóŋ:ô |
| | | 1PL.INCL | ânáŋ:â |
| 2SG | anɔʔó | 2PL | aná:kâ |
| 3M | anɪʔí | 3P | ané:kê |
| 3F | aná:kô | | |

The possibility was mentioned in section 6.1.1 that tone may play a role in marking the case of core pronouns, with subjects marked by a Low-Low melody and non-subjects marked by a High-High melody. In (6.13), the tone pattern appears to be different again, with the 1SG, 2SG & 3M forms showing a Low-High melody, while the 1PL, 2PL, 3F & 3P forms show a High-Fall melody. However, this paradigm was elicited using a frame in which the target phrase came at the end of the utterance, and the tone of a vowel in this position tends to fall away. So it is possible that the word-final tones marked here as Falling are underlyingly High.³ This would give the plural and 3F forms the High-High melody that might be expected for a non-subject pronoun, and would leave only the 1SG, 2SG & 3M as outliers. Whilst it is not clear why the latter forms should differ in this way, it should be noted that they are extremely unusual forms, being the only words in Katcha in which the glottal stop appears as a phonemic consonant. It is perhaps possible that the presence of the glottal has some effect on the

³This speculation is supported by the fact that one of my speakers pronounced the 2nd singular and 3rd masculine examples with a High final tone, while one pronounced them with a Falling final tone.

tone of the preceding vowel, or perhaps that these forms are a relic of some historical or borrowed feature.

6.2.2 Prepositions requiring oblique pronouns

Locative

The preposition *ká* is a general locative. Specific locative relations are expressed by adverbs which are used in conjunction with the locative preposition (see section 6.4 below). But *ká* may be used on its own where the relation is basic ('in', 'on', 'at', 'to' etc.) or perhaps where the precise relation is clear from context. Some examples are given in (6.14-6.17).

(6.14) to(wards)

a:fú úŋkúnú **ká** kókkô

ants 3M.go.to LOC Kuku

'Ants are moving towards Kuku'

(6.15) on/in

uŋɔ k-irikirí túmmá ma kácâ **ka** na-wáráka

1PL.EXCL PL-write words of Katcha LOC PL-paper

'we write the Katcha language on paper'

(TEACH:1.39)

(6.16) to; at/in

k-á-ácó **ká** má-t-á:mâsala **ka** dí

PL-PFV-go LOC F-SG-priest LOC house

'They went to the sorceress's house.'

(THIEF:1.6)

(6.17) on; to

a Yasu tunggeene ana awwa ka 'bïidi ungunu ka katalaadene

a jasú t-uŋke:ne ana awwa **ka** ßi:ti uŋkunú **ka** ka-talaatene

SUBJ Jesus INF-go.out INSTR leg LOC water 3M.go.to LOC PL-disciple

tanno ini

ta-no ni

NON.CORE-DEM.P 3M

'Jesus came to the disciples, walking on the water'

(MAT 14.25)

Possessed Locative

The preposition *kítta* refers to a relation of possession between its complement and some location, i.e. ‘place of’, ‘house of’. It may be used with or without a head noun, i.e. the possessed location may be specified or not. Where there is no explicit head noun, *kítta* is interpreted as ‘X’s place’ or ‘X’s house’, as in (6.18).

- (6.18) A Yasu co kitta dhabbu ma naFarsiin
 a jasu aco **kítta** ʃabu ma na-farisi:n
 SUBJ Jesus 3M.go **place.of** big of PL-Pharisee
 ‘Jesus went to the house of a prominent Pharisee.’ (LUK14.1)

Where there is an explicit head noun, *kítta* essentially acts as a possessive marker, as in (6.19):

- (6.19) aaco 'di kitta Samaan
 a-acɔ ɖi **kítta** sama:n
 3M.PFV-go house **place.of** Simon
 ‘he went to Simon’s house.’ (LUK4.38)

It is only grammatical to use *kítta* where the possessee is a location. When this condition is met, noun phrases using *kítta* are synonymous with standard possessive noun phrases construction (which use a form of the demonstrative pronoun as discussed in chapter 5). Thus (6.20) and (6.21) are synonymous.

- (6.20) kókkú úḡkúnú cá lámá:cá kítta kákka
 Kuku 3M.go.to DIR grinding.hut **place.of** Kaka
 ‘Kuku is going to Kaka’s grinding room.’
- (6.21) kókkú úḡkúnú cá lámá:cá tá-mó kákka
 Kuku 3M.go.to DIR grinding.hut NON.CORE-3F.DEM Kaka
 ‘Kuku is going to Kaka’s grinding room.’

Use with personal pronouns

When the locative is followed by a personal pronoun, the pronoun is taken from the oblique pronouns. As is standard in Katcha, elision and/or assimilation occur when two vowels come together. Thus when spoken in the context of a sentence such as (6.22), the vowel of the locative preposition is deleted, and the initial vowel of the pronoun takes a high tone (6.23).

- (6.22) aafu ungunu **k-été**
 ants 3M.go.to **LOC-1SG**
 ‘Ants are moving towards me’

- (6.23) Locative preposition (*ká*) + personal pronouns
- | | | | |
|-----|-------------|----------|-------------|
| 1SG | kété | 1PL.EXCL | kíti |
| | | 1PL.INCL | káca |
| 2SG | kútú | 2PL | kátá |
| 3M | kíní | 3P | kéné |
| 3F | kónó | | |

In the context of an utterance such as (6.24), the final vowel of the possessed locative *kítta* appears to assimilate rather than be deleted. This has the effect of making the initial vowel of the pronoun sound long. The long vowel has a low tone (6.25).

- (6.24) kókkó úṅkónú cá lámá:cá kítte-eté
 Kuku 3M.go.to DIR grinding.hut **place.of-1SG**
 ‘Kuku is going to my grinding room.’

- (6.25) Possessed locative preposition (*kítta*) + personal pronouns
- | | | | |
|-----|-----------------|----------|-----------------|
| 1SG | kítte:té | 1PL.EXCL | kítte:ti |
| | | 1PL.INCL | kítta:ca |
| 2SG | kítte:tú | 2PL | kítta:tá |
| 3M | kítte:ní | 3P | kítte:né |
| 3F | kítte:nó | | |

6.2.3 Prepositions requiring both core and oblique pronouns

Dative

The preposition *a* marks a noun phrase which stands in some kind of dative relation to the verb and occurs in a number of contexts. In (6.26) the dative preposition marks the indirect object of a trivalent verb, the semantic recipient.

- (6.26) akká mó m-anáṅa kóri **a** kókkô
 woman DEM.F 3F.give food DAT Kuku
 ‘This woman is giving food to Kuku’

In (6.27) the dative preposition marks the semantic benefactive, an additional argument licensed by the addition of the applicative suffix to the verb.

- (6.27) **akká m-ɔni-tá kúri a kókkô**
 woman 3F.make-APL food DAT Kuku
 ‘The woman is cooking food for Kuku’

A different use of dative *a* is seen in (6.28) where, used in conjunction with the verb *ɔŋɔ* ‘be’, the dative argument takes the role of possessor.

- (6.28) **türü kungngo a 'Bii'bala ma tötü'd'dü ka 'büdhülü**
turu k-ɔŋɔ a ɓi:ɓala ma totuɗ:u ka ɓuɗulu
 power 3P-be DAT son of human LOC earth
 ‘The Son of Man has authority on earth’ (LUK 5.24)

As noted in section 6.2.1 above, there is a clear distinction between instrumental *ana* and dative *a*. This goes against the analysis of Stevenson (1941:76), who suggests that these are the same morpheme with the choice of *ana* or *a* being phonologically conditioned (/a/ before consonants and /an/ before vowels). In fact, it can be seen from the examples given below that whilst the two prepositions are homonymous before a consonant (6.29-6.30), they behave quite differently before a vowel. The instrumental is indeed realised as /an/ before a vowel (6.31), but the dative is elided (6.32). Moreover, Stevenson’s own data supports this analysis (and contradicts his own), causing him to note that ‘*a* disappears between two vowels’ (Stevenson 1941:77). This comment is made with reference to a dative context; Stevenson’s instrumental examples behave as his analysis suggests.

- (6.29) **kókkú ɔŋké:ne a mottú**
 Kuku 3M.move INSTR horse
 ‘Kuku is going by horse’

- (6.30) **akká mó m-anáŋa kúri a kókkô**
 woman DEM.F 3F-give food DAT Kuku
 ‘This woman is giving food to Kuku’

- (6.31) **kókkú ɔŋké:ne an úŋku**
 Kuku 3M.move INSTR leopard
 ‘Kuku is going by leopard’

- (6.32) **akká mó m-anáŋa kúri omúdí tí-já**
 woman DEM.F 3F-give food man NON.CORE-DEM.M
 ‘This woman is giving food to this man.’

Further evidence of the distinction between instrumental *ana* and dative *a* can be found in the draft Katcha New Testament. In (6.33) the instrumental, as part of the phrase *ö'dö ana* ‘bring’, is written as *a* before the consonant-initial noun *kadu* (a) but as *ana* before the vowel-initial noun *ömö'di* (b).

- (6.33) a. *köö'dö* *a* *kadu* *tanno* *amaara no* *iini*
k-o-odo *ana* *katu* *ta-no* *ama:ra no* *i-ini*
 3P-PFV-COME INSTR people NON.CORE-DEM.P be.sick DEM.P DAT-3M
 ‘they brought the sick to him’ (MAT 14.35)
- b. A *kadu* *tö'dö* *ana* *ömö'di* *a* *Yasu*
 a *katu* *t-odo* *ana* *omodī* *a* *jasu*
 SUBJ people INF-come INSTR man DAT Jesus
 ‘people brought a man to Jesus.’ (MAT 12.22)

By way of comparison, in the phrase *ikkī a* ‘say to’, the dative preposition is written as *a* before the consonant-initial noun (6.34a) but is not written before the vowel-initial noun (6.34b).

- (6.34) a. *ikkiri* *ka* *tikki* *a* *kadu* *tanno* *ungeene nja*
ikkiri *ka* *t-ikki* *a* *katu* *ta-no* *uŋke:ne nca*
 3M.then DCM INF-say DAT people NON.CORE-DEM.P go.out ACCOMP
iini no
ini no
 3M DEM.P
 ‘then he said to the people who were following him’ (MAT 8.10)
- b. *İkkiri* *ka* *tikki* *ömö'di*
ikkiri *ka* *t-ikki* *omodī*
 3M.then DCM INF-say man
 ‘Then he said to the man,’ (LUK 9.41)

The draft Katcha New Testament also provides additional evidence for the *a*/zero alternation exemplified in (6.34). This evidence comes from inconsistencies in the transcription of phrases. For example, at the time of writing the phrase ‘said to the man’ is written in the Gospel of Luke five times as *ikkī ömö'di* and four times as *ikkī a ömö'di*. That is to say, the translators have written the dative *a* approximately half the time and approximately half the time they have dropped it. This may suggest an awareness that the dative preposition is semantically present, but elided due to the phonological context. For comparison, the corresponding consonant-initial phrase ‘said to the people’ occurs seven times in the Gospel of Luke and is *always* written with the

dative preposition: *ikkĩ a kadu*. This would be expected given that the preposition is phonologically present in this context.

Use with personal pronouns

When the dative is followed by a personal pronoun, the pronouns are mixed: 1st and 2nd person pronouns are taken from the core pronouns, while 3rd person pronouns are taken from the oblique set.

In the case of the core pronouns (1st and 2nd person), the dative preposition appears to undergo elision, as would be expected given its interaction with nominal complements. The 2nd person plural pronoun has a High-High tone melody, in the case of the other core pronouns, the melody is consistently Low-High. It is not clear to what extent this affects the speculation in section 6.1 that tone on core pronouns may be related to case. In the case of the oblique pronouns (3rd person), the preposition appears to assimilate to the initial vowel of the pronoun which is therefore realised as long. The long vowel has a low tone. Thus in the context of an utterance such as (6.35), the dative pronouns are realised as in (6.36).

- (6.35) *akká mɔ m-anáŋa kúrrɪ aʔá*
 woman DEM.F 3F-GIVE food 1S
 ‘This woman is giving food to me’

- (6.36) Dative preposition (*a*) + personal pronouns
- | | | | |
|-----|-------------|----------|-------------|
| 1SG | <i>aʔá</i> | 1PL.EXCL | <i>ʊŋŋɔ</i> |
| | | 1PL.INCL | <i>aŋŋá</i> |
| 2SG | <i>ɔʔɔ</i> | 2PL | <i>á:ká</i> |
| 3M | <i>ɪ:ní</i> | 3P | <i>e:né</i> |
| 3F | <i>ɔ:nó</i> | | |

Accompaniment

The preposition *nca* marks accompaniment, ‘with’; it is also used for coordination, ‘and’. Both uses are exemplified in (6.37).

- (6.37) *tító ʊŋ ka dí nca kúkkú nca kákka*
 Tito 3m.be LOC house ACCOMP Kuku ACCOMP Kaka
 ‘Tito is in the house with Kuku and Kaka.’

That the ‘and’ use of the accompaniment preposition is genuine co-ordination can be seen in the fact that when the subject is a conjoined noun phrase, it triggers plural subject agreement on the verb (6.38).

- (6.38) Sakariya nja Alisabet kümmü tumma ma Sogo ana eedi
 sakarija nca alisabet k-um:u tum:a ma soko ana e:ti
 Zacharia ACCOMP Elizabeth 3P-catch words of God INSTR stomach
 dhorro
 t̪r:ɔ
 strongly

‘Zacharia and Elizabeth were righteous in God’s eyes.’ (LUK 1.6)

As noted in section 6.2.1, the instrumental preposition *ana* can refer to a kind of ‘accompaniment’, where the relationship is unequal. Thus in (6.9), repeated here, the sentence implies that Kuku is showing the way, whereas in (6.39) the use of *nca* implies a joint, equal action.

- (6.9) kókkó úḡké:ne ana aʔá
 Kuku 3M.move INSTR 1SG
 ‘Kuku is going with me’ (He is showing me the way)

- (6.39) kókkó úḡké:ne nca aʔá
 kuku 3M.move ACCOMP 1SG
 ‘Kuku is going with me’ (We are going together)

Use with personal pronouns

When the accompaniment preposition is followed by a personal pronoun, the pronouns take the same form as they do with the dative: 1st and 2nd person pronouns are core pronouns, while 3rd person pronouns are taken from the oblique set. As with the dative, the vowel of the preposition is elided with the core pronouns in 1st and 2nd person, and assimilates to the pronoun vowel with the oblique pronouns in 3rd person. Tones are also the same as with the dative. Thus in the context of an utterance such as (6.40), the accompaniment pronouns are realised as in (6.41).

- (6.40) tító uḡ ka dí nca aʔá
 Tito 3m.be LOC house ACCOMP 1SG
 ‘Tito is in the house with me.’

(6.41) Accompaniment preposition (*nca*) + personal pronouns

1SG	<i>ncaʔá</i>	1PL.EXCL	<i>ncuŋŋó</i>
		1PL.INCL	<i>ncaŋŋá</i>
2SG	<i>ncɔʔó</i>	2PL	<i>ncá:ká</i>
3M	<i>nci:ní</i>	3P	<i>nce:né</i>
3F	<i>ncɔ:nó</i>		

Directional (source)

The preposition *ntama* marks source, ‘from’. It is primarily, if not exclusively, used to refer to physical direction as exemplified in (6.42)

(6.42) *kókkú odo ntama sɪ:ka tá-nó íní*

Kuku 3M.come SOURCE field NON.CORE-DEM.P 3M

‘Kuku is coming from his field.’

Use with personal pronouns

When the directional source preposition is followed by a personal pronoun, it takes the same mix of pronouns as the dative and accompaniment. Tones and vowel elision/assimilation are likewise identical. Thus in the context of an utterance such as (6.43), the directional pronouns are realised as in (6.44).⁴

(6.43) *kókkú odo ntama aʔá*

Kuku 3M.come SOURCE 1SG

‘Kuku is coming from me.’

(6.44) Directional (source) preposition (*ntama*) + personal pronouns

1SG	<i>ntamaʔá</i>	1PL.EXCL	<i>ntamuŋŋó</i>
		1PL.INCL	<i>ntamaŋŋá</i>
2SG	<i>ntamɔʔó</i>	2PL	<i>ntamá:ká</i>
3M	<i>ntamɪ:ní</i>	3P	<i>ntame:né</i>
3F	<i>ntamɔ:nó</i>		

⁴It should be noted that the speakers I worked with found some of these sentences odd, particularly where the source is 1st person. It was hard to tell if these are ungrammatical in that *ntama* cannot be oriented from the speaker, or if they were merely semantically anomalous. In any case, they were in unanimous agreement that these were the correct forms of pronoun to use with this preposition.

6.3 Related Morphemes

It is worth commenting at this point on several other morphemes which behave in similar ways to prepositions, particularly with respect to the pronoun forms they take.

6.3.1 Directional (goal)

The morpheme *ca* may be a preposition. This morpheme occurs in (6.20-6.21) where it is glossed as DIR ((6.21) is repeated below for convenience). However, its status is unclear. It may be a weakened form of locative *ká*, or it may be a fully-fledged preposition in its own right, formed from the verb *acɔ* ‘go’. A third analysis would be that, at least in some instances, it has not undergone grammaticalization and remains a form of the verb.

- (6.21) kókkó úḡkúnú cá lámá:cá tá-mó kákka
 Kuku 3M.go.to DIR grinding.hut NON.CORE-3F.DEM Kaka
 ‘Kuku is going to Kaka’s grinding room.’

Evidence that *ca* may be a form of *ká* comes from the fact that there seems to be an alternation between the two forms. Although in (6.21) *úḡkúnú* ‘go.to’ is followed by *cá*, in (6.14) and (6.17) the same verb is followed by locative *ká*, with no obvious difference in meaning. Stevenson (1941:74) also notes this alternation, stating that it is restricted to certain verbs. An additional piece of evidence is the fact that during fieldwork no examples of *ca* with personal pronouns were found. This would be unexpected if *ca* were a preposition. It would also be unexpected if *ca* were a verb that takes a direct object, which appears to be the case in (6.18-6.19). So it may be that directional *ca* is in fact a variant of locative *ká* which occurs in certain (as yet unspecified) contexts.

Waag (2012:4) suggests that although *ca* is clearly related to the verb, it may have grammaticalized in certain contexts and so includes *c-* in her table of case affixes as ‘direction to’ (Waag 2012:6). In the draft Katcha New Testament, *ca* is commonly glossed as ‘to’, rather than ‘go’, which *may* suggest some native speaker intuition in this direction. In regard to its interaction with personal pronouns, Waag places *ca* in the third group, those which take core 1st and 2nd person pronouns but oblique 3rd person pronouns. As just noted, I was unable to confirm this. If Waag’s data is accurate, this would clearly distinguish *ca* it from locative *ká*, which takes oblique forms throughout.

The third possibility is that *ca* is a variant of the verb *acɔ* ‘go’. This is the view taken by Stevenson (1941:74). As evidence, he cites the negative imperative form, though the argument is somewhat opaque, consisting of three example sentences and the statement, ‘the negative imperative indicates that no preposition is involved.’ (Stevenson 1941:74) In the draft Katcha New Testament this morpheme, which is most frequently realised

phonetically as /ca/ is invariably spelled as ‘co’. This *may* suggest some native speaker intuition that it is at least related to the verb. More significantly, it is not unusual for the (fully inflected) verb form *acɔ* to follow another verb of motion. Generally this is *úŋké:ne*.⁵ The combination *úŋké:ne acɔ* occurs frequently, often expressing the notion of leaving or setting out to go somewhere as in (6.45). It may be that *úŋkónú acɔ* is also a licit combination of verbs, and that *ca* following the verb of motion in (6.21) is in fact a form of the verb *acɔ*.

- (6.45) *unggeene aaco* a *naanya ku'b'ba*
uŋke:ne a-acɔ a *na-anya kuɔɔba*
 3M.go.out 3M.PFV-go DAT PL-town far.away
 ‘he set off for a distant country.’ (LUK 15.13)

My tentative analysis is to take the third position and to treat *ca* as a verb form. One of the additional pieces of evidence for this analysis comes from looking more carefully at its complement. In (6.18-6.19), the verb *acɔ* seems to take a direct object. However, in (6.45) it appears to be followed by the dative marker *a*. This is a pattern that is repeated throughout the corpus of written Katcha. For example, in the Gospel of Luke, there are 31 examples of *acɔ* followed directly by a (consonant-initial) nominal object, but 6 examples of *acɔ* followed by dative *a* before the noun. The ‘preposition’ *ca/cɔ* shows a similar pattern. There are 33 examples in Luke of *cɔ* followed directly by a (consonant-initial) nominal object, but 15 examples of *cɔ* followed by dative *a* before the noun. There is no obvious pattern to the presence or absence of the dative *a*; I leave aside the question of whether there is a pattern yet to be discovered, whether it is genuinely optional or whether there is simply an orthographic inconsistency.⁶ The relevant fact is that the ‘preposition’ *ca/cɔ* displays the same behaviour as the verb *acɔ*.

During fieldwork, no examples of *cɔ* with personal pronouns were elicited; according to the Katcha speakers I worked with, it is not possible for *cɔ* to be followed by a personal pronoun. This contrasts with Waag’s (2012:6) description of *c-* as belonging to the third type of preposition, which take core 1st and 2nd person pronouns but oblique 3rd person pronouns. In the draft Katcha New Testament there are very few examples of *cɔ* followed by a pronoun. The only attested examples are all with the 3rd person masculine oblique pronoun *ɪni* (written with a lengthened initial vowel). There is insufficient data to be conclusive, but one plausible speculation is that the reason I was unable to elicit a *cɔ*+pronoun sequence when asking for it directly is that such

⁵ *úŋké:ne* is a non-goal-directed verb of motion (‘go off, go out, wander’) and contrasts with *úŋkónú* which implies a goal or destination (‘go to’).

⁶ Given the fact that Katcha vowels so frequently undergo processes of harmony and/or ellision, it is plausible that these examples contain an underlying *a* that has been elided and that the translators may have been inconsistent in whether or not they have included it in the transcription.

sequences do not exist, and that the correct analysis is in fact **cɔ+a**+pronoun. This would be consistent with the form of the pronoun which occurs in the New Testament and also with Waag's data. If this speculation turns out to be correct, that **cɔ** is followed by dative **a**, it would strongly suggest that the 'morpheme' commonly realised as **ca** is underlyingly a **cɔ+a** sequence and that **cɔ** is in fact (a form of) the verb **acɔ**. Of course, such an analysis does not preclude the possibility that **cɔ+a** is in the process of undergoing grammaticalization into a preposition **ca**.

6.3.2 Possessive

Demonstrative pronouns *ja/mɔ/nɔ*

Possessive phrases and relative clauses are formed using the demonstrative pronoun. A full analysis of these constructions is given in chapter 5. The relevance to the current discussion is to note that when the possessor (or the subject of the relative clause) is a pronoun, the oblique form of the pronoun is used. The vowel of the demonstrative pronoun assimilates to the initial vowel of the pronoun making it long. The initial vowel takes a high tone. Thus in a context such as (6.46), the 'possessive pronouns' are realised as in (6.47).

- (6.46) **ɲɔɲɔɲɔɲɔɲɔ** **jé-été**
 k.o.spear DEM.M-1SG
 'my spear'

- (6.47) Masculine demonstrative pronoun (**já**) + personal pronouns

1SG	jé:té	1PL.EXCL	jí:ti
		1PL.INCL	já:ca
2SG	jú:tú	2PL	já:tá
3M	jí:ní	3P	jé:né
3F	jó:nó		

Possessive *ma*

In addition to the demonstrative pronoun, nouns may be modified by the morpheme **ma**. According to Stevenson, this is used for 'non-intimate possession' (Stevenson 1941:47) or for 'cases where the relationship is not one of possession, eg. denoting origin, composition.' (Stevenson 1956-57:61) It is often used when a noun is modified by another nominal, as in (6.48).

- (6.48) a. **katu ma kácâ**
 people **of** Katcha
 ‘Katcha people’ (TEACH:1.1)
- b. **tómmá ma kácâ**
 words **of** Katcha
 ‘Katcha language’ (TEACH:1.30)
- c. **katalaana ma tumma ma seriye**
ka-tala:na ma tumma ma serije
 PL-teacher **of** words **of** law
 ‘the teachers of the Law’ (MAT 5.20)

One semantic distinction between the two modifying morphemes is exemplified in (6.49). When the modifier of *tumma* is introduced by *ma*, the relationship is non-possessive (6.49a); when the modifier of *tumma* is introduced by the demonstrative pronoun *nɔ*, the relationship is one of possession (6.49b). In the former case, ‘words of David’ refers to a story about David; in the latter ‘words of the children’ refers to the children’s words.⁷

- (6.49) a. **Taalo aaga kakiiri [tumma ma Dawud] ka sorne**
ta:lɔ a:ka k-ak-iri tumma ma tawu:t ka sɔrne
 NEG 2PL P-PFV-see words **of** David LOC book
 ‘Haven’t you read in the Scriptures what David did?’
 (‘words of David’ = words about David) (MAT 12.3)
- b. **Naföönyö o’o [tumma na laala] no**
na-fo:ɲo ɔ?ɔ tumma nɔ la:la nɔ
 2S-hear 2S words **DEM.P** children **DEM.P**
 ‘Do you hear what these children are saying?’
 (‘words of children’ = children’s words) (MAT 21.16)

Another use of *ma* is in kinship relations. It appears that in describing close relationships the demonstrative pronouns are preferred (6.50), while for more distant relationships *ma* is used (6.51).

⁷These facts are not specific to *tumma*. Stevenson (1991:358) gives a further example: ‘*dí yá Kúkù* would be the usual form, but *dí má Kúkù* (not usual) could mean “a Kuku-like house”, “a house of the kind Kuku would build.”’

- (6.50) [Nüimö meede] oogo müye
 ni:mo me-ete ɔ:kɔ m-i:je
 mother DEM.F-1SG 3F 3F-be.where
- a [nagöre neede] eege küye?
 a nak-ore ne-ete e:ke k-i:je
 SUBJ PL-brother DEM.P-1SG 3P 3P-be.where
- ‘Who is my mother, and who are my brothers?’ (MAT 12.48)

- (6.51) a. ká-tá:tá ma aŋ:á
 pl-grandparent of 1PL.INCL
 ‘our grandparents’ (TEACH:1.20)
- b. kafaafa maaga
 kafa:fa ma a:ka
 ancestors of 2PL
 ‘your ancestors’ (LUK 11.47)

The distinction between (6.50) and (6.51) suggests that, in a sense, close relationships are ‘owned’ more than distant ones. That the relationship is the relevant factor here is indicated by (6.52), where both types of ‘possession’ are used in not only the same source, but the same sentence. Again, the more distant relationships (‘friend’ and ‘clan’) are modified by *ma* while the closer relationship (‘brother’) is modified by the demonstrative pronoun *nɔ*.

- (6.52) fa tūmmünü [kateefe ma o'o] nja
 fa t-ummunu ka-te:fe ma ɔ?ɔ nca
 leave INF-call PL-friend of 2SG ACCOMP
- [nagöre tanno üüdü] nja [siliga ma o'o]
 nak-ore ta-nɔ utu nca silika ma ɔ?ɔ
 PL-brother NON.CORE-DEM.P 2SG ACCOMP clan of 2SG
- ‘do not invite your friends or your brothers or your relatives’ (LUK 14.12)

Some doubt is thrown on this analysis, however, by the fact that there are some examples of certain relational nouns occurring with both types of ‘possessive’. These occur even within the same passage and, unlike the example of (6.49) above, it is not clear that there is a semantic distinction to which the difference can be attributed. In Matthew chapter 5, *diidi*, ‘enemy’, occurs with both *ma* and *nɔ* (6.53).

- (6.53) a. *anu ka diidi ma o'o*
anu ka tɪ:tɪ ma ɔʔɔ
 IMP.SG.reject LOC enemy of 2SG
 ‘hate your enemies’ (MAT 5.43)

- b. *aaga asaasa nadiidi naada*
ak asa:sa na-tɪ:tɪ na-ata
 IMP.PL love PL-enemy DEM.P-2PL
 ‘love your enemies’ (MAT 5.44)

More surprisingly still, in Matthew chapter 25, *nagöre*, ‘brothers’, also occurs with both types of ‘possessive’.

- (6.54) a. *eema yaada ka küüni a*
e:ma ja-ata ka k-u:ni a
 things DEM.M-2SG DCM PFV-do INSTR
 [**nagöre tanno eede**] no dhiidhi no, aaga
nak-ore ta-nɔ ete nɔ tɪ:tɪ nɔ, a:ka
 PL-brother NON.CORE-DEM.P 1SG DEM.P small DEM.P 2PL
küüni ana a'a.
k-u:ni ana aʔa
 PL-do INSTR 1SG
 ‘whatever you did for one of the least of these brothers of mine, you did for me’ (MAT 25.40)

- b. *niiimö ya kara takalinggo a*
ni:mo ja k-ara t-ak-almɔkɔ a
 thing DEM.P PL-CERT INF-PFV-do INSTR
 [**nagöre ma a'a**] tanno dhiidhi no aaga kakalinggo
nak-ore ma aʔa ta-nɔ tɪ:tɪ nɔ a:ka k-ak-almɔkɔ
 PL-brother of 1SG NON.CORE-DEM.P small DEM.P 2PL PL-PFV-do
ana a'a
ana aʔa
 INSTR 1SG
 ‘whatever you did not do for one of the least of these, you did not do for me.’ (MAT 25.45)

The data in (6.53) and (6.54) suggest that the choice between *ma* and *ja/ma/nɔ* is not be completely determined by the nature of the relationship. One possibility is simply that the choice is optional, but it should be noted that in the case of *öre*, ‘brother’,

the demonstrative is used *significantly* more often than *ma*, so the association of the demonstrative construction with the closer relationships is at the very least a strong tendency.

Another point to note is that both (6.53) and (6.54) involve obvious contrast. The pairs of propositions they express are parallel and opposite. The stylistics of written Katcha prose are outwith the scope of this research but it appears that the translators have chosen contrasting grammatical constructions to express these contrasts. This is not just true of the type of possessive used, but there are also contrasts in tense, number and vocabulary. So one possibility is that in these cases, the translators have deliberately used the ‘wrong’ possessive construction for stylistic effect.

Use with personal pronouns

When possessive *ma* is followed by a personal pronoun, the pronouns used are the mixed set which occurs with dative etc., i.e. 1st and 2nd person pronouns are taken from the core set of pronouns, while 3rd person pronouns are taken from the oblique set. This means that in the written sources, there is an ambiguity between possessive *ma* and the feminine demonstrative pronoun *mɔ́* when used with 3rd person pronouns; both require oblique pronouns. (This ambiguity does not arise in the 1st and 2nd persons where *ma* takes core pronouns and *mɔ́* takes oblique pronouns.) However, there is a tonal difference in the ‘possessive’ markers, *mɔ́* carrying high tone while *ma* appears to carry low tone, so it is likely that this difference will be visible in the pronominal forms. My data for possessive *ma* comes mainly from written sources, so the tones on these pronouns cannot be confirmed. If they match those on the dative pronouns, the paradigm will be as in (6.55). The paradigm for the feminine demonstrative pronoun is also given in (6.56) for comparison.

(6.55) Possessive *ma* + personal pronouns (tone marking provisional)

1SG	<i>maʔá</i>	1PL.EXCL	<i>muŋŋɔ́</i>
		1PL.INCL	<i>maŋŋá</i>
2SG	<i>mɔʔɔ́</i>	2PL	<i>má:ká</i>
3M	<i>mi:ní</i>	3P	<i>me:né</i>
3F	<i>mɔ:nó</i>		

(6.56) Feminine demonstrative pronoun (*mó*) + personal pronouns

1SG	mé:té	1PL.EXCL	mí:ti
		1PL.INCL	já:ca
2SG	mú:tú	2PL	má:tá
3M	mí:ní	3P	mé:né
3F	mó:nó		

6.4 Modification of locative phrases

6.4.1 Locative adverbs

It was mentioned in section 6.2.2 that specific locative relations are expressed by adverbs used in conjunction with the locative preposition *ká*. Stevenson (1941) refers to these words as postpositions, which is also the view taken by Reh (1983) for Krongo. However, in his review of Reh's later monograph Dimmendaal (1987) makes a convincing case for considering them to be adverbs:

The main function of these locative elements is to provide additional information on the location, in particular when an other than the "normal" location or emphasis is involved. Therefore, these location markers are modifiers themselves, rather than heads of adpositional phrases [...] and should thus be treated as adverbials rather than postpositions (Dimmendaal 1987:173).

The Katcha facts are similar to those of Krongo so Dimmendaal's arguments also hold for Katcha. These locative words should be considered adverbs rather than postpositions. They regularly occur in constructions where they clearly modify verbs rather than nouns. In such constructions they occur after both the verb they modify (6.57) and after any objects (6.58).

(6.57) A kadu no ungeene kidha no
 a katu nɔ ŋjke:ne kɪʔa nɔ
 SUBJ people REL.P walk in.front REL.P
 'Those who led the way' (LUK 18.39)

(6.58) Muurugu naguugaara keere ka tauugaara tanno eene
 m-u:roku nak-u:ka:ra ke:re ka tau:ka:ra ta-nɔ ene
 3F-send PL-king back LOC kingdom OBL-POSS 3P
 'He has brought down rulers from their thrones' (LUK 1.52)

The most common function of locative adverbs is to modify prepositional phrases, particularly phrases with the general locative preposition *ká*. In this way they serve to further specify the location referred to by the locative phrase. As a modifier, the adverb follows the locative phrase (6.59-6.65).

- (6.59) **ke:re** ‘behind’
 katu ná tt-óǒǒ [k-íti ke:re] nǒ
 people DEM.P PROSP-come LOC-1PL.EXCL behind DEM.P
 ‘People who come after us’ (TEACH:1.62)
- (6.60) **kítá** ‘in front’
 ak-oǒo ak-atáǒá [k-été kítá]
 IMP.PL-come IMP.PL-stand.in.line LOC-1SG in.front
 ‘come, line up in front of me’ (THIEF:1.10)
- (6.61) **kǒǒ** ‘above/on top’
 ya mǐsǐ ka’dǐngǒ [kini ko’do] ya
 ja misi ka-aǒǐko k-mǐ on.top ja
 DEM.M stone DCM-fall LOC-3M on.top DEM.M
 ‘he on whom the stone falls’ (MAT 21.44)
- (6.62) **katumbu** ‘under’
 A Ömǒ’dǐ taalo ara tatta ïssǐ ka lamba anangnga
 a omodǐ ta:lǒ ara t-atta issi ka lamba ananǵa
 SUBJ man NEG CERT INF-light fire LOC lamp 3M.put
 [ka dhafala katüm’bü]
 ka ǵafala katumbu
 LOC pottery under
 ‘No one lights a lamp and puts it under a bowl’ (MAT 5.15)
- (6.63) **kétté** ‘near’
 ikkírǐ ka t-uǵké:ne o-oǒo [k-ónǒ kétté]
 3M.then DCM INF-go.out 3M.PFV-come LOC-3F near
 ‘Then he came near her’ (THIEF:1.18)

(6.64) *katé:né* ‘within’

a. ‘among’

m-odo t-ossu t-áɲð:rɔ [k-áca katé:né]
 3F-come INF-know SG-thief LOC-1PL.INCL within

‘she will know the thief from among us’

(THIEF:1.3)

b. ‘inside’

eege taalo kinynyo iini [ka eedi kateene]
e:ke ta:lɔ k-iɲɲɔ ɪ-mɪ ka e:ti kate:ne
 3P NEG 3P-go DAT-3M LOC stomach within

‘it does not sink deep into him’

(MAT 13.21)

(6.65) *kɔ:na* ‘all over’ (also ‘together’)

a *türü na Sogo ta'dara* [kene koonna]

a *туру na sɔkɔ t-adara k-ene kɔna*

SUBJ power DEM.M God INF-be.light LOC-3P all.over

‘the glory of the Lord shone around them’

(LUK 2.9)

The construction exemplified in (6.59-6.65), a locative adverb following a locative noun phrase, is the most common way of specifying location. An alternative construction is also available, where the locative adverb precedes a noun phrase marked by possessive *ma*. There does not seem to be any obvious semantic difference between the two constructions, and in fact both may be found in the same sentence. In (6.66) we find both *ka kadu kiɲa*, ‘before men’, and *kiɲa ma puppa tjete*, ‘before my Father’.

(6.66) *Ömö'di ya amma kede* [ka kadu kidha] ya,

omodí ja amma k-ete ka kadu kiɲa ja

man DEM.M accept LOC-1SG LOC people in.front DEM.M

ara a'a tamma kini [kidha ma Puppa tiya eede]

ara a?a t-amma k-mi kiɲa ma puppa tɪ-ja ete

CERT 1SG INF-accept LOC-3M in.front of Father NON.CORE-DEM.M 1SG

‘Whoever acknowledges me before men, I will also acknowledge him before my Father.’

(MAT 10.32)

An exception to these generalisations is *kuro*, ‘outside’. According to Stevenson (1941:82), *kuro* only occurs preceding a *ma*-marked noun phrase and not following a *ka*-marked noun phrase. A search through the draft Katcha New Testament affirms this assertion, in that there are no attested examples of *ka* *kuro*, while *kuro ma* does indeed occur (6.67).

- (6.67) ne'bi taalo ara teyi [kürö ma Örsaliim]
 neβi ta:lɔ ara t-eji kuro ma orsalɪm
 prophet NEG CERT INF-die outside of Jerusalem
 'no prophet can die outside Jerusalem' (LUK 13.33)

One possible explanation for the fact that *kuro* does not occur with locative noun phrases might be that this would create a semantic contradiction. The preposition *ká* introduces a general location for an event (eg. 'at' the denotation of some noun phrase), which is then further specified by the locative adverb. But in the case of 'outside', the location of the event is explicitly *not* 'at' the denotation of the noun phrase. In other words perhaps the reason that *ka*___*kuro* does not occur is that it is impossible to be both 'at' something and 'outside' it.

Moreover, Katcha locative adverbs generally appear to be derived from the locative preposition followed by a noun of location (often a body part). Thus *keere* 'behind' is derived from *ka* + *eere* ('back'), while *kɔ:na* 'all over/together' comes from *ka* + *ɔ:na* ('body'). However, this is not true of *kuro*, despite its having an initial /k/. In (6.68) *kuro* occurs as the complement of dative *a* suggesting that it is in fact a noun (at least in this context). In contrast, the complement of *a* in the corresponding phrase referring to 'inside' is the noun *te:ne* and not the locative adverb *katene* (6.69). This fact is borne out by Stevenson who gives a probable derivation for all locative adverbs *except kuro*.

- (6.68) a kadu tadhifi co a kürö
 a katu t-aʒifi cɔ a kuro
 SUBJ people INF-drop go DAT outside
 'it is thrown out' (MAT 5.13)

- (6.69) Kaco a teene miini
 k-acɔ a te:ne ma-mɪ
 PL-go DAT inside of.3M
 'They went in.' (LUK 24.3)

The fact that *kuro* is not analysable into locative plus noun (and that there is therefore no locative adverb meaning 'outside') may be considered additional evidence for the suggestion that there is a semantic incongruity between *ká* and 'outside'. This in turn provides a semantic explanation for the absence of *ka*___*kuro* in Katcha.

Although most commonly used with *ká*-marked nouns, locative adverbs do sometimes follow other prepositional phrases, primarily in directional contexts. The semantics of such constructions seems to be the same as that of constructions with *ká*: the

preposition gives a general direction ('to' or 'from') which is then further specified by the adverb (6.70-6.71).

- (6.70) Nööh co [a murkabu kateene]
 noo acɔ a murkabu kate:ne
 Noah 3M.go DAT boat within
 'Noah went into the boat' (LUK 17.27)

- (6.71) mö'dö [ndama iini keere]
 m-odo ntama ni ke:re
 3F-COME from 3M behind
 'she came up behind him' (MAT 9.20)

One non-directional example is found in (6.72), where the interpretation is existential rather than locative.⁸

- (6.72) A Farisiin öccö ungnö [a kadu kateene]
 a faris:in occo ungnɔ a katu kate:ne
 SUBJ Pharisee some 3M.be DAT people within
 'Some Pharisees were among the people' (LUK 19.39)

6.4.2 Additional prepositional phrases

When referring to body parts, Katcha uses a construction that looks very similar to that used with locative adverbs (6.73-6.74). Indeed, because most locative adverbs are derived from words for body parts, in some cases the lexical items are the same. In (6.73), for example, the interpretation is 'ants are crawling on my body'. As with locative adverbs, the prepositional phrase gives a general location ('on me') which is specified further by the subsequent prepositional phrase.

- (6.73) a:fú úrúné:né k-ete k-ɔ:na
 ants 3M.crawl LOC-1SG LOC-body
 'ants are crawling on me'
- (6.74) marooro ka tabunaana kini ka üüdü
 m-arɔ:rɔ ka t-apuna:na k-mi ka u:tu
 3F.immediately DCM INF-oil LOC-3M LOC head
 'she poured oil on his head' (MAT 26.7)

⁸Note that it is perfectly possible for *ká* to co-occur with *ungnɔ* when the context is locative: *kungnɔ ka murkabu* 'they were in a boat' (MAT 4.21).

An interesting question would be whether (6.73) is ambiguous between ‘ants are crawling on my body’ (*kɔ:na* meaning ‘on body’) and ‘ants are crawling all over me’ (*kɔ:na* meaning ‘all over’). A possible answer to this question may come from looking at the tone melody of the locative pronoun. Before locative adverbs the pronoun carries the usual tone melody, as given in the paradigm in (6.23, repeated below). But in the context of (6.73), the tone melody of the locative pronoun appears to be different (6.75). It is not certain why this is, but it is certainly possible that it serves to differentiate sentences like (6.73) where the general locative is further specified by an additional prepositional phrase from those where it is further specified by an adverb.

(6.75) locative preposition *ká* + personal pronouns, before *kɔ:na*, ‘LOC-body’

1SG	kete	1PL.EXCL	kiti
		1PL.INCL	kaca
2SG	kutu	2PL	kata
3M	kní	3P	kené
3F	kónó		

(6.23) Locative preposition (*ká*) + personal pronouns

1SG	kété	1PL.EXCL	kíti
		1PL.INCL	káca
2SG	kútú	2PL	kátá
3M	kíní	3P	kéné
3F	kónó		

Having now looked at the locative preposition *ká* in some detail, it can be seen that it is a very general locative. It can be thought of as an essentially underspecified locative relation. Where the precise relation can be established from context through general pragmatic principles, *ka* on its own is sufficient. Elsewhere it requires to be further specified, and this may be done through the use of locative adverbs or (at least in the case of body parts) an additional locative phrase. This underspecification means that the locative preposition may be used in a wide range of contexts and is one of the reasons *ká* is so ubiquitous in Katcha.

6.5 Lexical specification of prepositions

In section 6.2 it was noted that the line between case markers and adpositions is very fine, and that one way of distinguishing between them is to consider the question of whether or not the form used is ‘imposed by the structure within which the noun phrase occurs’ (Payne 1997:100). If we adopt this as a rule of thumb, the question of optionality becomes key. In the majority of examples cited in this chapter there is no obligation for a noun phrase to be marked with a particular morpheme, thus the characterisation of them as prepositions rather than case markers. The use of these prepositions seems to be primarily down to communicative intent.

There are nonetheless a few verbs which require their complements to be headed by particular prepositions. An obvious example is the ditransitive verb *anáŋá*, ‘give’ whose indirect object is marked by dative *a*. It was also argued in section 6.3.1 that *cɔ*, ‘go’, requires an object marked by dative *a*. In addition to these, a few verbs require their object to be marked with locative *ká*, even though there does not seem to be any locative interpretation (6.76-6.78).

(6.76) *anu* ‘refuse’

a *ömö'di* *ya* [*anu kada*] *ya*,
a *omodí* *ja* *anu* *k-ata* *ja*
 SUBJ man DEM.M 3M.refuse LOC-2PL DEM.M
i'i [*anu kede*]
rʔi *anu* *k-ete*
 3M 3M.refuse LOC-1SG

‘he who rejects you rejects me’ (LUK 10.16)

(6.77) *fa* ‘keep’

á *másala* [*t-afa k-átá*]
 SUBJ God INF-keep LOC-2PL

‘May God keep you’ (TEACH:1.58)

(6.78) *e:ma* ‘speak’

ara *aaga* [*teema ka tumma no*] *kede* *ko'do*
ara *a:ka* *t-e:ma* *ka* *tumma nɔ* *k-ede* *kɔdɔ*
 CERT 2PL INF-speak LOC words DEM.M LOC-1SG up

‘you will quote this proverb to me’ (LUK 4.23)

Stevenson (1941:75) gives a more substantial list of *ka*-taking verbs than this, but on closer inspection the majority of these appear to be constructions where the complement

of the verb is a verb or a clause. The verb is often in a non-finite form, which makes it ‘not always easy to distinguish whether a noun or a verb has been used.’ (Stevenson 1941:104) But a number of the verbs Stevenson lists, which take *ka* before an infinitive, seem *not* to take *ka* when the object is unambiguously a noun. In such cases, the *ka* is better thought of not as a preposition, but as a dependent clause marker.

Overall, it seems that there are very few verbs which lexically determine the form their complements must take. As such, there does not seem to be sufficient evidence to describe these morphemes as case markers.

6.6 Pronominal case

It has been argued throughout this chapter that the morphemes which specify oblique argument roles in Katcha are better described as prepositions than as case markers. This is on the basis that these oblique arguments do not generally have their form assigned obligatorily by the verb. This is not the same for pronouns, the form of which clearly is determined by some governing element, either the verb or a preposition. There is therefore a strong argument for describing the forms of the pronouns as cases. This is particularly true for the core pronouns where tone seems to play a role.

As noted in section 6.1.1, it may be that the case of the core pronouns is marked by their tone melody. The use of tone to mark case is extremely rare in a global perspective and arguably does not exist at all outwith Africa, but is common in eastern Africa: ‘tone as a marker for case is the most salient feature of case behaviour in Africa’ (König 2008:224). There are a couple of comments to be made regarding the fact that Katcha may exhibit tonal case. One is a typological implication: the case alignment is likely to be ‘marked-nominative’. Marked-nominative systems display the same alignment as accusative case systems; that is, the subjects of both transitive and intransitive clauses (the S and A arguments) are marked in the same way, while the object of a transitive clause (the P argument) is treated differently. However, in a prototypical marked-nominative language, the accusative form is functionally and morphologically unmarked, acting as the default form, whilst the nominative form is morphologically marked with its use restricted to the realisation of S and A arguments. In that sense, marked-nominative systems are slightly reminiscent of ergative systems. Like tonal case, marked-nominative systems are rare from a global perspective, but ‘constitute the most widespread type of case systems in Africa’ (König 2008:138). More significantly,

‘there is a connection between case expressed by tone and the existence of a marked-nominative system... If case is expressed by tone then there is a marked-nominative system.’ (König 2008:198,224)

Therefore it is to be expected that if Katcha has tonal case it will have a marked-

nominative alignment.⁹

A further interesting observation is that within tonal case systems it is particularly common for low tone to be the marker of Nominative case, which appears to be the case in Katcha. This tendency appears to be a universal feature of both the Cushitic (Afro-Asiatic) and Nilotic (Nilo-Saharan) families. There are other language families with tonal case which use other tone patterns to mark Nominative, but in Cushitic and Nilotic, ‘the nominative is always expressed by loss of a high tone, triggering a low tone’ (König (2008:223), citing Tosco (1994)). In the context of the ongoing debate about the genetic affiliation of the Kadu family, this is notable because Katcha nominals share characteristics with both of these families. The tripartite number marking system described in chapter 4 as being common in Nilo-Saharan is particularly prevalent in Nilotic, and this is also one of the few branches of Nilo-Saharan with a masculine-feminine gender system. Also in chapter 4, it was demonstrated that Katcha’s highly unusual gender system is found in several Cushitic languages. So whether it is a genetic or areal trait or a typological correlation, it seems that Katcha nominals do not only share features of number and gender with Nilotic and Cushitic languages, but also case.

It is important at this point to state the caveat that there remains a great deal that is unclear about the tonal system of Katcha, and a good percentage of my textual data originally comes from written sources which do not mark tone at all. As such, conclusions about tonal behaviour should be treated as tentative. It is plausible that the differences in tone melody on pronouns which have been ascribed to case may in fact be conditioned by other factors, such as intonation or position in the sentence. Nonetheless, given its geographical location, it would not be surprising to find case marked by tone in Katcha.

If the tone variation on core pronouns is indeed a marker of the Nominative and Accusative cases, it may be that the oblique form of the pronouns described in section 6.1.2 should also be thought of as a case, presumably ‘Oblique’ case. It is different from the tonal case exhibited in core pronouns, however, in that it is not assigned by verbs but by prepositions.

Pronominal case can be summarised as follows. The verb assigns tonal case, which I tentatively take to be Nominative and Accusative, to the core arguments. Peripheral arguments are not generally marked by case, but by prepositions (though see section 9.6 for discussion of the status of dative *a*). These prepositions also assign case, either Accusative (section 6.2.1), Oblique (section 6.2.2) or a mixture of both (section 6.2.3).

⁹König (2008:198) suggests that this correlation is an absolute universal in the case of nouns, but that with pronouns tonal marking may also be found in a few languages with accusative case alignment. The question of whether Katcha nouns exhibit tonal case alternations remains open, pending a fuller investigation of tone. It could be that case is only relevant to pronouns, in which case the possibility exists that Katcha is one of the small number of exceptions with an accusative system realised by tone.

6.7 Conclusion

This chapter set out to describe the various forms of pronoun found in Katcha and to explain the differences between them. Given the fact that the choice of pronominal form is heavily dependent on the role it plays in the sentence and (in oblique cases) which preposition it follows, an extended discussion of prepositions and similar morphemes was necessary before it was tentatively concluded that these different forms are realisations of case. Core cases (Nominative and Accusative) are assigned by verbs, while prepositions assign Accusative or Oblique case to their pronominal complements.

The pronominal system once again reflects the importance in Katcha of the contrast between the notions of ‘core’ and ‘peripheral’.¹⁰ There are two sets of pronouns, one of which is used for the core arguments of subject and object while the other is used for oblique arguments. For this reason, I have proposed referring to these sets of pronouns as the core pronouns and the oblique pronouns respectively. Even if it is correct that there is a distinction between the nominative and accusative cases, this still amounts to a secondary differentiation within the category of core pronoun.

When we look at the interaction between the pronouns and prepositions it becomes clear that these contrasting notions of core and non-core apply in other areas of the language, and not just to argument structure. There are three types of prepositions: those which take core pronouns as complements, those which take oblique pronouns as complements and those which take a combination. The third group, which includes the great majority of prepositions, is perhaps the most interesting because of the nature of the combination of pronouns. The relevant factor in this case is whether or not the preposition’s complement is a speech act participant. In 1st and 2nd person, i.e. the core speech act participants, these prepositions take core pronouns as their complements. In the 3rd person, i.e. non-speech act participants, the oblique pronouns are used. In this way, there is a morphologically realised connection between the notion of core arguments with regard to sentential predicate-argument structure and the notion of core participants with regard to speech act participation. The fact that the pronouns used for subject and object (*vis a vis* oblique arguments) are also used for speaker and hearer (*vis a vis* non-participants) gives further support to the idea that the main difference between the two sets of pronouns is that of ‘core’ *vs* ‘peripheral’.

¹⁰For example, this is also seen in the area of nominal modification where the demonstrative pronoun is morphologically marked with the *t*-prefix when the modified noun is a peripheral argument.

Chapter 7

Verb Extensions

Introduction

This chapter provides a description of derivational verbal suffixes in Katcha. Following a common Africanist tradition, they are referred to as ‘verb extensions’ (VEs). Although they attach to verbs, a full description and analysis of these suffixes falls within the scope of this study because their function is to increase or decrease semantic valency. In other words, they directly impact on nominals by licensing or prohibiting their presence as arguments within the proposition. Section 7.1 briefly introduces the concept of verb extensions and lists the various morphemes in Katcha which may potentially be analysed as VEs.

The vast majority of VEs in Katcha are detransitivising. These are discussed in section 7.2 and a descriptive analysis is given showing how they can be classified according to the number and type of argument roles they license.

In addition to the valency reducing VEs discussed in section 7.2, Katcha has one morpheme which appears to be valency increasing, namely applicative. This morpheme is discussed in section 7.3, where it is noted that in several ways the Katcha ‘applicative’ is rather atypical.

Finally, Katcha has reciprocal and reflexive forms. These are functionally similar to the valency decreasing verb extensions of section 7.2, but it is questionable whether or not they should be classed as verb extensions. They are discussed in section 7.4.

7.1 Possible Verb Extensions in Katcha

The suffixes generally referred to in Africanist literature as ‘verb extensions’ (VEs) may have a wide variety of functions, examples of which are given in (7.1). Most of these would be classed as derivational.

(7.1) Verb suffixes may:

- a. *increase valence*
causative, benefactive, dative, instrumental, locative, etc.
- b. *decrease valence*
passive, reciprocal, stative, middle, etc.
- c. *(re-)orient action*
reversive, directionals (goal/source, towards/from speaker), etc.
- d. *mark aspect*
pluractional, inchoative, resultative, perfective/imperfective, etc.

(Hyman 2007:149)

VEs are best known from studies of Bantu, but are by no means limited to it:

‘verb extensions are found through the Niger-Congo family [...] similar derivational suffixes appear throughout Africa, perhaps as an areal feature [...] Verb extensions are amply attested in languages from the three other African language phyla’ (Hyman 2007:150)

A number of VEs are found in Katcha. There is no mention of them in any of the more recent studies of Katcha, but Stevenson (1941:110-115) comments on these suffixes, describing them as ‘derived species of verbs’ and my data is largely consistent with his. Katcha VEs all attach to transitive verb roots: where the semantics of a Katcha verb allow it to be transitive, this is always the simple form.¹ Verb extensions in Katcha all serve to alter propositional argument structure by either increasing or decreasing valency — in terms of the possible functions of VEs listed in (7.1), all Katcha VEs belong to either group (a) or group (b). The vast majority of Katcha VEs (7.2-7.5) reduce semantic and/or syntactic valency, though there is also an Applicative suffix which may be argued to increase valency (7.6). The Reciprocal marker (7.7) may arguably also be analysed as a verb extension.

(7.2) Antipassive

- a. **akká m-ówó míkile**
woman 3F-grind millet
‘the woman is grinding millet’

¹Of course there are also verbs which are inherently intransitive: *í:só* ‘run’ is one Katcha example.

- b. **akká m-úwó-ǎno**
 woman 3F-grind-ANTIP
 ‘the woman is grinding’

(7.3) Passive

- a. **akká m-uni kúri**
 woman 3F-cook food
 ‘a woman is cooking food’
- b. **kuri uni-tené**
 food 3M-cook-PASS
 ‘the food is being cooked’

(7.4) Unaccusative

- a. **kuri uni-tené**
 food 3M.cook-PASS
 ‘the food is being cooked’
- b. **kuri uni-nca kúbú**
 food 3M.cook-UNACC down
 ‘the food is cooked’

(7.5) Middle Voice

- a **tumma no tanyalanjaana ku'bu ka 'buugu kooná nye'd'de**
 a **tum:a nɔ t-ɔnala-ncana kɔbu ka bu:ku kɔ:na jeɖe**
 SUBJ words DEM.3P INF-spread-MID down LOC place across all
kungngo
kɔŋ:ɔ
 thus

‘News of this spread through all that region.’

(MATT 9.26)

(7.6) Applicative

- a. **akká m-uni kúri**
 woman 3F-cook food
 ‘the woman is cooking food’
- b. **akká m-uni-tá kúri a kúkku**
 woman 3F-cook-APPL food BEN Kuku
 ‘the woman is cooking food for Kuku’

(7.7) Reciprocal

- a. kókkú ɪcí ɓí:ɓálá
 Kuku 3M.wake boy
 ‘Kuku wakes the boy’
- b. la:lá ɪci-**ce:né**
 boys 3M.wake-RECIP
 ‘the children wake each other’

7.2 Valency reducing suffixes

7.2.1 Antipassive

A verb suffixed with an Antipassive marker corresponds to Stevenson’s “Intransitive Stem” (Stevenson 1941:110). There are two main Antipassive suffixes, the choice of which appears to be lexically determined by the verb. Probably the more common is *-VnV* (7.8b-7.11b), while *-VkV* (7.12b-7.13b) is also attested. In both cases the quality of the vowel in the suffix varies according to the vowel(s) in the verb root. The tone on the suffix also varies but there does not seem to be any clear pattern to this variation.

- (7.8) a. akká m-úwú míkile
 woman 3F-grind millet
 ‘the woman is grinding millet’

- b. akká m-úwó-**ɓno**
 woman 3F-grind-ANTIP
 ‘the woman is grinding’

- (7.9) a. ómúdí abó ámbâ
 man 3M.beat drum
 ‘the man is hitting the drum’

- b. ómúdí abá-**ánâ**
 man 3M.beat-ANTIP
 ‘the man is hitting’

- (7.10) a. kókkú ɪcí ɓí:ɓálá
 Kuku 3M.wake boy
 ‘Kuku wakes the boy’

- b. **kókkú ice-éné**
 Kuku 3M.wake-ANTIP
 ‘Kuku wakes up’
- (7.11) a. **kókkú íkící kákkâ**
 Kuku 3M.laugh.at Kaka
 ‘Kuku is laughing at Kaka’
- b. **kókkú íkíce-éné**
 Kuku 3M.laugh.at-ANTIP
 ‘Kuku is laughing’
- (7.12) a. **kókkú ocó fi:ɔ**
 Kuku 3M.see cow
 ‘Kuku sees a cow’
- b. **kókkú ocó-óko**
 Kuku 3M.see-ANTIP
 ‘Kuku sees’
- (7.13) a. **kókkú itíní míkile**
 Kuku 3M.sow millet
 ‘Kuku is sowing millet’
- b. **kókkú itíní-iki**
 Kuku 3M.sow-ANTIP
 ‘Kuku is sowing’

A possible further example of an antipassive suffix is **-ri** as found in **akúrí** ‘eat (intrans)’ (7.14b). This appears to be a unique suffix: no other examples of an antipassive **-ri** are attested in my data, and Stevenson also states that it is ‘an unusual form’ (Stevenson 1941:110). In addition, there is no sign of the vowel harmony between suffix and root which appears to exist for **-VnV** and **-VkV**. It may therefore be better to think of **akúrí** as a separate intransitive verb (though one clearly related to the transitive **akú**).

- (7.14) a. **kókkú akú míteene**
 Kuku 3M.eat asida
 ‘Kuku is eating asida’
- b. **kókkú akú-rí**
 Kuku 3M.eat-ANTIP
 ‘Kuku is eating’

As stated in section 7.1, the simple form of the Katcha verb is always the transitive. This is rather striking in examples such as ‘wake’ (7.10a) and ‘laugh’ (7.11a). It is not hard to conceive that a language might treat the intransitive ‘wake’ as the less complex form, rendering the transitive with a causative or similar device. Similarly, it seems intuitive that in English, intransitive ‘laugh’ is semantically more basic than transitive ‘laugh at’, a fact which is reflected in the morphosyntax. This is not the case in Katcha. Morphologically at least, the transitive is always the simpler form, with the intransitive being formed by the use of the Antipassive suffix.

Semantically, the Antipassive is used where the identity of the semantic theme or patient is unknown or unimportant to the point of non-existence. As a (relatively) fully pro-drop language, a clause in which the patient is known or implied may be expressed using an ordinary transitive verb. (7.15a) gives an example of a verb whose object, being implied, is simply ‘dropped’. (For comparison, (7.15b) shows the same verb with a full complement of overt object arguments.)

- (7.15) a. **n-adáŋŋá ê:ne**
 1S-give 3P
 ‘I give (it) to them’ (THIEF:1.19)
- b. **m-adáŋŋá nuk-urú:nú óŋŋó k-áţábbú**
 3F-give PL-year 1PL.EXCL 3P-be.many
 ‘she gives many years to us’ (TEACH:1.60)

Both the transitive and the antipassive forms of the verb, then, may occur with no overt syntactic object. The key distinction between them is semantic: a transitive verb with an implied semantic object is expressed using an unmarked transitive form; a transitive verb with no object (implied or otherwise) is expressed using a verb with an Antipassive suffix.

Stevenson (1956-57:58) states that the Antipassive suffix (which he calls ‘Qualitative’) may in fact be used with ‘indefinite objects’, in which case it has a general or habitual interpretation. He gives one example:

- (7.16) **bibala iyana éfɔ**
brɔbala ija-ana e:fɔ
 boy 3M.milk-ANTIP cows
 ‘The boy milks cows, (i.e. he cow-milks in general).’ (Stevenson 1956-57:58)

Although (7.16) has a syntactic object, it seems clear that the sentence does not refer to an event in which any individual actually undergoes milking, i.e. the semantic theme/patient has no denotation. To that extent, this construction is still in keeping

with the function of these suffixes. It is probably still appropriate to think of the suffix as marking antipassive.²

7.2.2 Passive ('Personal Passive')

The suffix *-tené* marks a verb as passive. The subject agreement marker on the verb agrees with the syntactic subject, which carries the thematic role of theme/patient:

- (7.17) a. **akká m-uni kúri**
 woman 3F-cook food
 'a woman is cooking food'
- b. **kuri uni-tené**
 food 3M.PFV-cook-PASS
 'the food is being cooked'
- (7.18) a. **ómúdí abú ámbá**
 man 3M.hit drum
 'the man is hitting a drum'
- b. **ambá m-abu-tené ká tábe:ne**
 drum 3F-hit-PASS LOC wrestling
 'the drum is being hit for wrestling'

The *-tené* suffix is used where there is an implied agent and as such is described by Stevenson as a "true passive" (Stevenson 1941:113). He states that 'it often implies that someone is implicated in the action, and may have a noun complement' (Stevenson 1941:113), giving (7.19) as an example which includes an explicit agent introduced by the dative preposition *a* or locative preposition *ka*:

- (7.19) **bibala abadhene a pupa thi yeni**
 (or ki)
- bíbala abu-tene a puppa ti-ja i:ni**
 (ka)
- boy 3M.hit-PASS PREP father NON.CORE-3M.POSS 3M
 'The boy is beaten by his father' (Stevenson 1941:113)

However, the presence of a noun phrase taking the role of agent, as in (7.19), does not agree with my fieldwork findings. In controlled elicitation sessions, I was unable to elicit a passive sentence with an explicit agent, nor have I found any clearcut

²This construction could perhaps be thought of as some kind of object incorporation, but I have no examples of it in my own data, nor have I investigated compounding more generally.

examples in the Katcha texts. In the Gospel of Luke for example, there are something over a hundred occurrences of verbs with passive morphology³, but only two examples have noun complements which might be considered to be the agent. Neither are unambiguous. To give an example, the noun phrase *kadu nye'd'de...* in (7.20) appears to be a potential candidate for the agent of *kussudene*. The sentence would then mean ‘God’s wisdom is known by all who accept God’s words’. However, we cannot discount the possibility that this noun phrase plays a more oblique semantic role, such as cause. That is, ‘God’s wisdom is known *because of* those who accept his words’, with the knower(s) being an implied third party. Indeed, if the English translation and the Katcha translation accurately paraphrase the same proposition, the latter is the favoured reading.

- (7.20) *ata'dara ma Sogo kussudene* [ka kadu nye'd'de kungngo
ata'dara ma sɔkɔ k-ussu-tene ka katu ɲedde k-ɔŋɔ
 wisdom of God 3P-know-PASS LOC people all 3P-be.present
tanno amma ka tumma tanno a Sogo
ta-nɔ am:a ka tum:a ta-nɔ a sɔkɔ
 NON.CORE-3P.REL accept LOC words NON.CORE-3P.REL INSTR God
 no]
 no
 3P.REL

‘God’s wisdom is shown to be true by all who accept it.’ (LUKE 7:35)

It seems then that the agent of a passive construction is made explicit very rarely, if at all. If the agent of an event is important enough to the discourse to be made explicit, the passive suffix is unlikely to be used. An analysis of discourse structure lies outwith the scope of this study, but given that syntactic subjects can occur after the verb as well as before, it is perhaps a plausible speculation that word order, rather than verbal morphology, is the device used to signal the relative prominence of verbal arguments.

³There are in fact 202 instances of words carrying the *-tene* passive suffix, but a number of these are derived nominal forms, such as *katalaadene*, ‘disciples’ (from *laala*, ‘teach’, thus ‘people who are taught’)

7.2.3 Unaccusative ('Impersonal Passive')

Although the agent of a verb marked with Passive *-tené* is seldom stated explicitly, it appears that its existence is nevertheless always implied. This contrasts with the other passive-like suffix *-nca*, which is described by Stevenson as 'Stative or Neuter-Passive' (Stevenson 1956-57:57). It has no obvious agent and in this sense can be thought of as an 'impersonal' type of passive. Perhaps the most useful term to use to describe this form is 'Unaccusative'.

Unaccusatives are defined by Perlmutter, within the framework of Relational Grammar, as containing 'a 2-arc but no 1-arc' (Perlmutter 1978:160). That is to say, they have an underlying direct object (usually the semantic Patient) which is 'advanced' to the position of subject but, unlike passives, have no Agent argument to be 'demoted' to an oblique position. Expressing this in more theory-neutral terms, an Unaccusative verb can be defined as one whose syntactic subject is its Patient/Theme argument and which has no Agent argument. This is exactly the situation which occurs with the Katcha *-nca* suffix and so 'Unaccusative' would seem to be an appropriate name for this suffix.

The contrast in meaning between Passive and Unaccusative forms can be seen in (7.21-7.23). Stevenson (1941:113-114) suggests that 'the general implication' of a verb marked with *-nca* 'is finality, or state.' Clearly, this does not mean that a verb marked with *-nca* must carry a stative/generic meaning: whilst this does appear to be the case for (7.23), examples (7.21-7.22) both refer to single events. Rather, it is a question of how the event is viewed. In the passive (7.21a/b, 7.22a) the focus is on the event itself, which is seen as an *action* and therefore has an implied agent. In the unaccusative (7.21c, 7.22b) the focus is on the result of the event, which is seen as a *process* and therefore has no implied agent. In both the passive and the unaccusative, the syntactic subject is the semantic undergoer (i.e. the patient) of the event described by the verb.

- (7.21) a. **kuri uni-tené**
 food 3M.cook-PASS
 'the food is being cooked'
- b. **kuri uk-uni-tene⁴**
 food 3M.PFV-cook-PASS
 'the food has been cooked'
- c. **kuri uni-nca kúbú**
 food 3M.cook-UNACC down
 'the food is cooked' (= 'has become cooked')

- (7.22) a. ɔ:jɔ arɔmɔ-tene^4
 grass 3M.cut-PASS
 ‘the grass is being cut’
- b. $\text{ɔ:jɔ arɔmɔ-na-nca kúɓú}$
 grass 3M.cut-ANTIP-UNACC down
 ‘the grass is cut’ (=‘has become cut’)
- (7.23) a. $\text{ambá m-abu-tené kâ tabe:né}$
 drum 3F-hit-PASS LOC wrestling
 ‘the drum is being hit for wrestling’ (currently)
- b. $\text{ambá m-abu-nca kâ tabe:né}$
 drum 3F-hit-UNACC LOC wrestling
 ‘the drum is hit for wrestling’ (habitually)

The Unaccusative is frequently followed by a locative adverb⁵, such as *kúɓú*, ‘down’ in (7.21c) and (7.22b). This does not appear to be obligatory, and never appears when there is some other complement of the verb (as in (7.23b)). However, where there is no complement, it seems to be strongly preferred.

There is a connection between the Unaccusative and the Antipassive, which manifests in two ways. The first is morphological. Stevenson states that the Unaccusative suffix is ‘by preference attached to intransitive verbs’ (Stevenson 1941:114). An example of this is shown in (7.22b). According to my data, the preference is not quite as strong as Stevenson’s statement suggests; indeed, his own data includes as many verbs with *-nca* attached to a transitive stem as to an intransitive one. Stevenson’s examples of verbs where *-nca* attaches to an Antipassive suffix largely concur with mine, suggesting that this is perhaps a lexical preference. Nonetheless, there appear to be a reasonable number of these, so it seems fair to say that there is at least some correlation between these two forms of the verb.

The second way in which Unaccusative and Antipassive are connected is a semantic one, seen in (7.23b). Like the Antipassive (see example 7.16), the Unaccusative can be used to describe events with a general scope or of a habitual nature. Thus while (7.23a) describes a present event, (7.23b) describes a habitual situation.

⁴Tones and vowel length are uncertain for this verb form.

⁵See chapter 6 for a discussion of these words.

7.2.4 Middle Voice

The suffix *-nca:na* denotes a type of Middle Voice. Unfortunately, the term ‘middle’ has been used in very different ways by different authors. To compare three different dictionaries of linguistics, for example: Crystal (2008) mentions only that the Greek middle ‘included verbs with a reflexive meaning’ (eg. *She cut herself*); Brown and Miller (2013) define middles as verbs whose subject ‘denotes a participant that is neither agent nor patient but controls the situation’ (eg. *One bomb didn’t guide and crashed*); finally, Matthews (2014) suggests that middles may include both ‘intransitive constructions that are understood reflexively’ (eg. *I shaved*) and intransitives with ‘a passive-like relation to [the] subject’ (eg. *This stone cuts easily*). The typology of voice alternations in WALs (Siewierska 2013) equates middles with anticausatives, describing them in similar terms as the unaccusatives discussed in the previous section. In summary, ‘there is no generally accepted definition or characterization of middle voice, let alone a satisfactory account of the relations among the various phenomena that have been given that name’ (Kemmer 1993:1).

Kemmer (1993:16-20) lists no fewer than thirteen phenomena which languages may mark morphologically as ‘middles’, including both lexically determined semantic classes of verbs (eg. ‘grooming’ verbs) and syntactic processes (eg. impersonal middles such as *the book is selling well*). She claims that there are two properties common to all of these, namely ‘1) Initiator as affected entity (Endpoint) and 2) low degree of elaboration of events’ (Kemmer 1993:238). According to Kemmer then, middles share some similarity with reflexives and reciprocals but differ in their ‘elaboration of events’. Middles express events using fewer fine-grained distinctions than reflexives or reciprocals do. A reflexive construction such as *John washes himself* expresses a relation between two participants, *John* as agent and *himself* as patient, and indicates that both participants happen to denote the same individual. On the other hand, a construction which presents the event more as the action of a single participant (*John washes*) is likely to be marked as a middle. Similarly, Kemmer argues that reciprocal marking presents an event as being made up of two or more relations: *John and Mary kissed each other* entails *John kissed Mary* and *Mary kissed John*, i.e. a kissing relation holds between John and Mary and a separate (but possibly concurrent) kissing relation holds between Mary and John. On the other hand, middle marking presents an event as involving a single, though two-way, relation between the two participants: *John and Mary kissed* implies a single act of kissing. Thus for Kemmer, the key characteristic of middles is that they describe an event with relatively little elaboration.

Finally, Payne describes middles as encoding ‘a process undergone by the PATIENT, rather than [...] an action carried out by an AGENT’ (Payne 1997:216). That is, the key characteristics of middles for Payne are that they present a situation as a largely non-agentive process, with the focus therefore on the affected participant.

Kemmer's and Payne's definitions of middle voice are not exactly the same as one another but taken together they seem to describe the Katcha data. In Katcha, verbs marked with *-nca:na* express the notion that the subject is both 'initiator' and 'end-point' to the extent that, in the draft Katcha New Testament, <njaana> is sometimes written as a separate word and glossed as 'one another'. However, the verb appears to express a single event with a single participant, with the subject an affected participant rather than an agent. Examples are given in (7.24-7.26).⁶

- (7.24) a tumma no tanyalanjaana ku'bu ka 'buugu koonā nye'd'de
 a tum:a nɔ t-aɲala-nca:na kuɓu ka ɓu:ku kɔ:na ɲe:ɛ
 SUBJ words DEM.3P INF-spread-MID down LOC place across all
 kungngo
 kuŋɔ
 thus
 'News of this spread through all that region.' (MATT 9.26)

- (7.25) a ten'di ma La ma Sogo tadhösönjaana ku'bu ka söödö
 a t-endi ma la ma sɔkɔ t-aɲoso-nca:ana kuɓu ka so:to
 SUBJ SG-clothes of room of God INF-break-MID down LOC middle
 'the curtain of the temple tore in two' (LUKE 23.45)

- (7.26) a neekiši tüürütü kasannanjaana ku'bu
 a nek-isi t-u:ritu k-asan:a-nca:na kuɓu
 SUBJ PL-stone INF-collapse 3P-disperse-MID down
 'the rocks split apart' (MATT 27.51)

Middle Voice is syntactically detransitivising; it takes no syntactic object and the syntactic subject (whilst arguably also the the agent-like argument) has a clear patient-like status. Thus the verb *asan:a*, glossed as 'disperse' in (7.26), is elsewhere used transitively to mean 'spray' (eg. *m-asan:a kɔntɔ* '3F-spray perfume'). Likewise in (7.27), which is the active equivalent of (7.24), it can be seen that the morphologically simple verb *ɲala* is transitive, taking an overt object *tum:a* 'words/news'. In (7.24), where *ɲalanca:na* carries the Middle Voice suffix, there is no syntactic object and *tum:a* has become the syntactic subject.

⁶I have no examples of Middle in my fieldwork data; it was almost two years after returning from fieldwork that I noticed its existence in the draft Katcha New Testament! All data in this section is taken from the text of the draft Katcha New Testament and tones are not marked.

- (7.27) *kaco nöö'di nja nasigeene kanyala tumma ku'bu 'do*
k-acɔ no:-di nca na-sike-ene k-apala tɔm:a kuɓu ɗɔ
 3P-go PL-house ACCOMP PL-field-PL 3P-spread words down very

‘they ran off and spread the news in the town and among the farms’

(LUKE 8:34)

The Middle suffix is highly reminiscent of the Unaccusative in several ways. Phonologically, the forms of the two suffixes appear to be related (/nca:na/ and /nca/ respectively). Syntactically, the Middle, like the Unaccusative, is generally followed by a locative adverb; most commonly this is *kuɓu* ‘down’, as in (7.24-7.26) but there are examples where a Middle verb is followed by *kɔɗɔ* ‘up’. Semantically, both the Unaccusative and the Middle downplay the role of the agent, to the extent that there is arguably either no agent at all or the agent is subsumed under the patient.

My data on middle voice in particular is quite limited, but perhaps the difference between the unaccusative and the middle is that middle voice focuses more on the process described by the verb, while the unaccusative generally describes an achievement with more of a focus on the state resulting from an action.

7.2.5 Summary of Valency-Reducing Verb Extensions

It is worth considering at this point how the various valency-reducing VEs might be related. One obvious possibility which raises itself is that the Middle Voice *-nca:na* might in fact be Unaccusative *-nca* followed by Antipassive *-VnV*. This certainly looks plausible from the form of the suffixes. However, it is perhaps somewhat counterintuitive to think that for a verb expressing a dynamic event, such as ‘break’, the focus might be placed on the resulting state by the addition of a suffix (*-nca*) and then put back onto the event itself by the addition of a further suffix (*-VnV*).

Stevenson does not make any mention of a middle suffix. He *does* make a claim that the antipassive suffixes ‘sometimes intensify the meaning of the parent verb’ (Stevenson 1941:112) so it seems likely that he would analyse (7.24-26) as an unaccusative verb with an intensity marker. However, I am not convinced by this. There are examples in the draft Katcha New Testament where it seems unlikely that the interpretation would be intensive. And Stevenson’s presentation of the data on this matter is somewhat opaque. He does not make clear whether an ‘intensifying’ morpheme suffixed to a transitive verb also causes it to become intransitive, for example. So I remain of the opinion that *-nca:na*, whether one morpheme or two, marks middle voice.⁷

Evidence that *-nca:na* should *not* be treated as a sequence of Unaccusative *-nca* followed by Antipassive *-VnV* comes from the fact that the Antipassive appears to be

⁷But see section 8.5 for a surprising but fascinating possible correlation between middle voice and intensity.

Verb Form	Suffix	Subject argument	Non-Subject argument	
Active	<i>unmarked</i>	A	P	
Antipassive	-VnV,-VkV	A	—	
Passive	-tené	P	A	
Unaccusative	-nca	P	—	(Achievement)
Middle Voice	-nca:na	P	—	(Process)

Table 7.1: Valency-reducing verb extensions and their argument roles

more closely linked to the root of the verb than the other suffixes. The quality of the vowel in the Antipassive suffix varies according to the vowels in the verb root but the other VE suffixes show no such vowel harmony. The Antipassive has two forms, the choice of which is lexically determined, whereas the other valency-reducing VEs each have only one form (which is generally quite productive). Finally, it was noted in section 7.2.3 that in some cases the Unaccusative suffix appears to attach to an Antipassive stem (as in example 7.22b). It may be then, that the Antipassive is more lexicalised than the other suffixes.

Nonetheless, the Antipassive does fit into the system of Katcha valency-reducing VEs, which may be organised according to two features, as summarised in table 7.1.

Firstly, there is the thematic role played by the syntactic subject. When the verb has the Active (unmarked) form or the Antipassive form, the most agent-like participant is the syntactic subject. When the verb has the Passive, Unaccusative or Middle Voice forms, the most patient-like participant is the syntactic subject.

The second feature denoted by these verb extensions is the number of arguments expressed. Katcha is pro-drop, so any semantic argument may be phonologically unrealised. However, the Active (unmarked) form and the Passive form of the verb each take two semantic arguments. Note that while the Passive reduces the verb's *syntactic* valency by demoting the Agent to the status of a (usually implied) oblique argument, the *semantic* valency is unchanged: there exists both an Agent and a Patient, even if the Agent is only there by implication. This contrasts with the other forms, the Antipassive, Unaccusative and Middle Voice, each of which take only one semantic argument.

In section 7.2.3 it was noted that there are morphological and semantic connections between the Antipassive and the Unaccusative, while in section 7.2.4 it was noted that there are phonological, syntactic and semantic connections between the Unaccusative and the Middle Voice. Looking at table 7.1, these correlations are not at all surprising: there is a clear functional similarity between these three suffixes. All of them mark the verb as having not only reduced syntactic valency, but also reduced semantic valency

due to a ‘missing’ non-subject argument.

7.3 Applicative

The applicative suffixes correspond to Stevenson’s ‘dative action’ (Stevenson 1941:112). Stevenson gives only one suffix under this heading, *-tV*, and my data concurs with his insofar as the most common applicative suffix in my data is *-tá* (7.28b-7.29b). However, some verbs take the suffix *-nV̂*, which appears to perform the same function (7.30b-7.31b). The distinction between *-tá* and *-nV̂* would appear to be a lexical property of the verb rather than any semantic property of the affix.

- (7.28) a. **akká m-ɔni kúri**
 woman 3F-cook food
 ‘the woman is cooking food’
- b. **akká m-ɔni-tá kúri a kókku**
 woman 3F-cook-APPL food DAT Kuku
 ‘the woman is cooking food for Kuku’
- (7.29) a. **kókkó itíní míkile**
 Kuku 3M.sow millet
 ‘Kuku is sowing millet’
- b. **itina-tá a kókku**
 3M.sow-APPL DAT Kuku
 ‘he is sowing millet for Kuku’
- (7.30) a. **akká m-ówó míkile**
 woman 3F-grind millet
 ‘the woman is grinding millet’
- b. **akká m-ówó-nô míkile a kókku**
 woman 3F-grind-APPL millet DAT Kuku
 ‘the woman is grinding millet for Kuku’
- (7.31) a. **omuđi urúbú đí**
 man 3M.build house
 ‘the man is building the house’
- b. **omuđi urubú-nú đí a kókku**
 Kuku 3M.build-APPL house DAT Kuku
 ‘the man is building the house for Kuku’

The additional argument introduced by the applicative-marked verb follows the direct object (where there is one). It is preceded by the dative preposition *a*, which marks it as an oblique argument rather than a core argument of the verb. Assuming that ‘applicative’ is defined as ‘a valence increasing operation that brings a peripheral participant onto center stage by making it into a *direct object*’ (Payne 1997:186, emphasis mine), this means that the *-tá/-nV̂* suffix does not strictly speaking mark applicative, but dative. Its function is still to license the presence of an extra argument beyond those required by the semantics of the verb (in contrast to ditransitive verbs such as *anáŋ:á* ‘give’ which require no such suffix). But rather than licensing the presence of a direct object, the suffix licenses the presence of a dative object. A further typical feature of applicatives which is lacking in Katcha is an alternation between applicative and non-applicative (eg adpositional) constructions. In Katcha there is no preposition that can be used with non-applicative verbs to mark benefactive. The only way to express a benefactive meaning is with the applicative construction. Languages do exist where the use of applicative constructions are obligatory, but it is more prototypical for applicatives to be optional (Peterson 2006:45-51). So this is another way in which Katcha does not exhibit prototypical applicatives. Nonetheless, I retain the use of the term ‘applicative’ for now since this is a widely used term for a morpheme on a verb which licenses the presence of an extra argument. The difference in the Katcha case is that the morpheme licenses an oblique, rather than core, argument.

The applicative form of a transitive verb does not appear to be affected by the presence or absence of an object. There is no difference between the morphology of the verb in (7.31b), where the direct object is present and that in (7.32), where there is no direct object.

- (7.32) *omudī urubú-nû a kókku*
 man 3M.build-APPL DAT Kuku
 ‘the man is building for Kuku’

One explanation of this is simply to note that as a ‘pro-drop’ language transitive verbs in Katcha do not require an overt object. Thus it may be the form in (7.32) is transitive, with an implied object; it would perhaps be better glossed as ‘the man is building it/something for Kuku’. The existence of examples such as (7.32) does not therefore preclude the existence of verbs which are both antipassive and applicative. The fact there are no clearly attested examples may simply be a matter of frequency and plausibility: the antipassive and the applicative are to some extent mutually exclusive. The antipassive is used to express situations in which there is no theme or patient and which are therefore quite general; the applicative is used to express situations in which there is a goal or a beneficiary and which are therefore much more likely to involve actions that are quite specific. It is not surprising that the two forms are seldom, if

ever, found together.

An alternative explanation is to note that there are two lexically-conditioned applicative suffixes, one of which displays vowel harmony with the root. As was speculated for the antipassive, this may be an indication that applicative verbs are lexicalised. If so, we would not expect to see an antipassive ‘suffix’ and an applicative ‘suffix’ on the same verb: both form part of the stem and are in the same ‘slot’.

The idea that the applicative may be lexicalised is supported by the existence of a couple of apparently irregular suffixes. The suffix *-nVkV* occurs with the verb *umu* ‘hold’ (7.33).⁸ It is unclear whether this is an irregular applicative morpheme; it may be a combination of Applicative *-nV̂* with some additional morpheme. No other examples of this suffix have been found.

- (7.33) a. **omudī umu kanʃa**
 man 3M.hold k.o.spear
 ‘the man is carrying a spear’
- b. **omudī umu-noku kanʃa a kukku**
 man 3M.hold-APPL k.o.spear BEN Kuku
 ‘the man is carrying a spear for Kuku’

Another apparently unique suffix is the *-nɔta* Applicative suffix which occurs only with the verb *ijɔ* ‘wash’ (Tuna dialect) (7.34). In this case there is a plausible diachronic explanation. In the larger ‘Katcha proper’ dialect, a different verb is used: *ɔkɔnɔ*, which takes the regular *-ta* applicative suffix (7.35). It seems probable that the irregular suffix in (7.34b) is a borrowing and reanalysis of the final two syllables of the verb in (7.35b), i.e. the final syllable of the root used in the Katcha dialect area has been taken along with the regular *-tá* suffix and reanalysed to create an irregular suffix.⁹

- (7.34) a. **akka m-ijɔ enddī** [Tuna dialect]
 woman 3F-wash clothes
 ‘a woman is washing clothes’
- b. **m-ijɔ-nɔta enddī a kukku**
 3F-wash-APPL clothes DAT Kuku
 ‘she is washing clothes for Kuku’

- (7.35) a. **akka m-ɔkɔnɔ enddī** [Katcha dialect]
 woman 3F-wash clothes
 ‘a woman is washing clothes’

⁸Tones unknown.

⁹Tones unknown for these two verbs.

- b. **m-ɔkɔnɔ-ta** **enddi** **a** **kukku**
 3F-wash-APPL clothes DAT Kuku
 ‘she is washing clothes for Kuku’

The existence of these various lexically-specified applicative suffixes, some of which exhibit vowel harmony with the root, may be evidence that applicative verb forms in Katcha have been (or at least are in the process of being) lexicalised, rather than being formed through a productive process of suffixation.

7.4 Reciprocal and Reflexive

In (7.7), repeated here as (7.36), **-ce:né** is given as a possible Reciprocal suffix.

- (7.36) a. **kúkkú** **ici** **ɔ́:ɔ́alá**
 Kuku 3M.wake boy
 ‘Kuku wakes the boy’
- b. **la:lá** **ici-ce:né**
 boys 3M.wake-RECIP
 ‘the children wake each other’

Given the pattern that exists in Katcha of verb extensions marking information about the arguments of the verb, it is natural to suppose that the Reciprocal marker should be considered to belong to this group of suffixes. However, there is also evidence that casts doubt on this analysis, suggesting that the Reciprocal marker should not be considered a suffix which changes the verb’s argument structure, but a pronominal element which is the object of the verb.¹⁰ There are two pieces of evidence which might support the latter view.

The first comes from the form of the morpheme: it seems clear that the Reciprocal marker is derived from either the Accompaniment preposition **nca** or the verb **ɔ** ‘go’ (which may be used to indicate directionality; see section 6.3.1), plus the 3rd person plural pronoun **ené**. Thus it is literally ‘with/to them’. Of course the fact that the Reciprocal marker looks like a pronoun does not prove that it is synchronically a pronoun, rather than historically derived from one, but it may be.

The second piece of evidence comes from the fact that Katcha reflexives (which are, of course, conceptually very similar to reciprocals) are *not* expressed using a verbal suffix, but using an idiomatic possessed noun phrase, sometimes using **ɔ:na**, ‘body’, as

¹⁰It is not one of the goals of this study to develop a theory of wordhood in Katcha. I have no strong opinions on whether **-ce:né** should be considered a suffix, clitic or word. However, if it could be shown that **-ce:né** should be analysed as a separate word, that would rule out the possibility of it being a verb extension.

in (7.37), but more commonly using *ejr*¹¹ ‘neck’ as in (7.38):

- (7.37) kudumma ömö'di tiya 'dinigi [oona niini] coo'do
 kutumma omodi tı-ja adınıkı ɔ:na nı-mı cɔ-ɔɔɔ
 because man NON.CORE-REL.M put body POSS.3P-3M DIR-up
 ya ara ta'diniginja ku'bu
 ja ara t-adınıkı-nca kuɓu
 REL.M CERT INF-put-UNACC down
 ‘For all those who make themselves great will be humbled.’
 (lit. ‘for the man who puts his body high will be put low’) (LUKE 14:11)

- (7.38) ömö'di ya ümmü [eyi yiini] ka tidhilli ya ara
 omodi ja ummu ejr yı-mı ka t-iɽıllı ja ara
 man REL.M make neck POSS.M-3M DCM INF-be.small REL.M CERT
 ta'diniginca coo'do
 t-a'dınıkı-nca cɔ-ɔɔɔ
 INF-put-UNACC DIR.up
 ‘Those who humble themselves will be made great.’
 (lit. ‘the man who makes his neck to be small will be put high’) (LUKE 14:11)

Since reflexives are expressed using a nominal construction, it is plausible that reciprocals would also be expressed using a (pro)nominal construction. However, the evidence is fairly inconclusive so it is possible that the Reciprocal marker may in fact be a verb extension after all.

7.5 Conclusion

In section 7.1 it was noted following Hyman (2007) that verb extensions in African languages may have one of four basic functions, listed in (7.39).

- (7.39) a. increase valence
 b. decrease valence
 c. (re-)orient action
 d. mark aspect

Of these four functions, the first two primarily affect the arguments of a proposition while the latter two primarily affect the predicate. That is, (a-b) primarily affect

¹¹Tones unknown.

nominals while (c-d) primarily affect verbs. Katcha verb extensions are all of the former type, licensing the presence or absence of arguments.

There are various morphemes related to argument structure which are potential candidates for being classed as verb extensions. Of these, reflexives and reciprocals are not encoded using verb extensions; Katcha uses a more analytic construction with a noun or pronoun expressing the reflexive or reciprocal object.

The applicative is the only one of the Katcha verb extensions to increase valency. This makes it something of a special case. However, it is also something of a special case in that it is not typical of applicative constructions typologically. There is no alternative non-applicative construction with the same truth-conditional meaning. Also, the additional argument it licenses is marked with the dative preposition *a* rather than being a direct object, so in one sense this morpheme does not increase valency. Rather, it introduces an oblique argument and so acts somewhat like a preposition. A Dynamic Syntax theoretical analysis modelling applicatives from this point of view is given in chapter 9.

If the ‘applicative’ does not in fact increase valency, then we can revise the statement at the beginning of this section to say that all Katcha verb extensions decrease valency; the function of all of them is to license the absence of a syntactic argument. This is not surprising given that it was noted in section 7.2 that Katcha verbs are inherently transitive. If it is semantically plausible for a verb to be transitive, this is always the basic form. Most of these VEs decrease semantic valency in addition to syntactic valency, presenting the event described by the verb as having only one participant (though this is not the case for the passive). As shown in table 7.1, Katcha has a complete paradigm of valency decreasing verb extensions. A theoretical analysis within the framework of Dynamic Syntax is given for these verb extensions in chapter 8. This range of VEs allows Katcha to use inherently transitive verbs to present an event as involving either one or two participants, and to take either the semantic agent or the semantic patient as subject, thereby providing alternative perspectives on the situation expressed.

PART III
Theoretical Analyses

Chapter 8

Verb Extensions

Introduction

In chapter 7, it was noted that the majority of verb extensions in Katcha are detransitivising and that these valency-reducing VEs can be classified according to two features, namely the thematic role played by the syntactic subject and the number of arguments expressed. This classification is summarised in table 7.1, repeated here as table 8.1.

Verb Form	Suffix	Subject argument	Non-Subject argument
Active	<i>unmarked</i>	A	P
Antipassive	-VnV,-VkV	A	—
Passive	-tené	P	A
Unaccusative	-nca	P	— (Achievement)
Middle Voice	-nca:na	P	— (Process)

Table 8.1: Valency-reducing verb extensions and their argument roles

The distinction between active and antipassive, and between passive and unaccusative/middle voice, is an important one. Katcha is pro-drop, so any semantic argument may be phonologically unrealised. However, the active (unmarked) form and the passive form of the verb each take two semantic arguments. Note that while passive may be defined as reducing the verb's *syntactic* valency by demoting the agent to the status of a (usually implied) oblique argument, the semantic valency is unchanged: there exists both an agent and a patient, even if the agent is only there by implication. This contrasts with the other forms, the antipassive, unaccusative and middle voice, each of which take only one *semantic* argument.

Valency reduction is something of a challenge for standard formal semantics.¹ A

¹Proponents of 'radical dissociation' do not have this problem, but Dynamic Syntax takes a classical

transitive verb expresses a relation, which by definition requires two arguments, raising the question of how a proposition with a ‘missing’ argument should be modelled. One approach is to allow the ‘missing’ argument role to be taken by some object of minimal semantic content, an object whose reference is both arbitrary and entirely context-dependent. Thus the agent of some unaccusative verb V in a given situation s is simply ‘the Ver in s ’. An unaccusative sentence like ‘Drums are beaten’ can be thought of informally as meaning ‘Drums are beaten (by the agent of drum-beating)’ or ‘Drums are beaten (by whatever it is that beats drums)’. This contrasts with passive verbs, which have two semantic arguments, even if the agent happens to be phonologically unrealised. A passive sentence like ‘Drums are being beaten’ can be thought of informally as ‘Drums are being beaten (by him/her/it)’ or ‘Drums are being beaten (by someone/something)’.

This chapter presents a Dynamic Syntax analysis of such constructions. Section 8.1 introduces the DS formalism and illustrates its use in a straightforward Katcha sentence with an active, transitive verb. Section 8.2 introduces the concept of epsilon terms. Dynamic Syntax construes all terms as terms of the epsilon calculus, and this provides a straightforward way to model the kind of term described in the previous paragraph. An epsilon term picks out an arbitrary witness of some predicate and this predicate can be easily defined as being dependent on the immediate context. Thus the epsilon calculus allows us to define, with relative ease, structures such as ‘Kuku is laughing (at some arbitrary object of Kuku’s laughter)’ or ‘Drums are beaten (by some arbitrary agent of drum beating)’ and section 8.2 presents an analysis of antipassive verbs in Katcha in these terms. It is argued that the lexical actions associated with the antipassive suffix build a context-dependent epsilon structure at the logical object node. Section 8.3 discusses passives, the implementation of which is very straightforward: it is simply a case of moving the pointer to ensure that the sentential subject decorates the logical object node. This analysis highlights the fact that the passive has a more referential interpretation for the agent, in contrast with the arbitrary interpretations of the ‘missing’ arguments of the antipassive, unaccusative and middle voice. Section 8.4 discusses unaccusative, the analysis of which is straightforward, following directly from the discussion in the previous two sections. Section 8.5 is slightly more speculative, considering what the analysis of middle voice might look like if it were to be treated as a sequence of unaccusative, followed by antipassive. Somewhat remarkably, under such an analysis, middle voice turns out to be truth conditionally equivalent to unaccusative but to carry extra information which might be interpreted as adding intensity, as suggested by Stevenson (cf section 7.2.5).

view of predicate-argument relations.

8.1 Transitive verbs

Dynamic Syntax (DS) (Kempson *et al.* 2001; Cann *et al.* 2005) is a representationalist, monostratal, parsing-based theory of syntax. It is representationalist in that it purports to represent the semantic content of natural language as structured formulae of a logical language. It is monostratal in that there is no level of syntactic representation; there are no syntactic ‘objects’. Rather, syntax is construed as the set of procedures which determine how such semantic representations are built up. And it is parsing-based in that these procedures are carried out incrementally as a string is parsed in real time. This is the sense in which DS is dynamic. As each word or morpheme is parsed it provides instructions for a transition from one partial semantic structure to another until a complete logical form is reached.

A completed semantic structure of Dynamic Syntax is a binary tree with nodes which are decorated with terms of the epsilon calculus and which may be combined according to the principles of the lambda calculus. Such a tree is built up step-by-step using a limited number of general principles (computational actions), and instructions provided by lexical material (lexical actions).

The parse of a simple transitive sentence such as (8.1) begins, like all parses, with the goal of establishing a proposition. This is represented in (8.2) by the expression $?Ty(t)$ which decorates the root node of a partial semantic tree, the question mark expressing a requirement for that node to be decorated by something of semantic type t . Ty is a label for the category *Type*, whose values may be t (proposition), e (individual), $e \rightarrow t$ (predicate), etc. A pointer, represented by \diamond , marks the node of the partial semantic structure currently under development. At this stage this is the only node in the tree.

- (8.1) **kókkó abu ambá**
 Kuku 3M.beat drum
 ‘Kuku is beating the drum’

- (8.2) Initial parse state

$?Ty(t), \diamond$

Computational actions in Dynamic Syntax are both conditional, in the sense that they require certain structural conditions to be met before they may apply, and optional. One rule which may apply at this point is *ADJUNCTION. This rule allows for the construction of an argument node (i.e. requiring type e) whose final position in the tree is unknown at the time of construction. That is, it is not known which argument of the proposition this node will ultimately represent. The underspecified relation between the root node and the unfixed argument is represented by the dotted line in (8.3). The

node is also decorated with a requirement that a position be found for it in the tree, $?\exists \mathbf{x}.Tn(\mathbf{x})$ (where Tn is a label for the category *Tree Node address*).

(8.3) Application of *ADJUNCTION

$$\begin{array}{c} ?Ty(t) \\ | \\ \vdots \\ | \\ ?Ty(e), ?\exists \mathbf{x}.Tn(\mathbf{x}), \diamond \end{array}$$

The next stage in the process is to parse the first item in the linguistic string, the proper name *kókkó*. As with computational actions, the syntactic contribution of a lexical item is to provide a set of instructions as to how to further develop the partial semantic structure. However in the case of a lexical item, this may also include providing semantic content to one or more nodes in the tree. This set of procedural instructions is the item's lexical entry, and is generally represented as a conditional package (or 'macro') of actions, as in (8.4).

(8.4) Lexical actions associated with *kókkó*:

<i>kókkó</i>	IF	$?Ty(e)$
	THEN	$put(For(Kuku'), Ty(e))$
	ELSE	abort

The lexical entry in (8.4) is very straightforward. When the string /*kókkó*/ is encountered, the parser checks whether the current node requires to be decorated with a semantic individual, i.e. whether there is a $?Ty(e)$ requirement on the node. If there is, then it decorates the node with the semantic content *Kuku'*, which is of type e . (*For* is a label for the category *Formula*, whose value may be any term of the epsilon and lambda calculi.) If there is not, the parsing process is aborted and the parse fails.

After carrying out the actions prescribed in (8.4), the unfixed node is type complete which means the pointer may return to the node above giving the partial tree in (8.5).

(8.5) Parsing *kókkó*

$$\begin{array}{c} ?Ty(t), \diamond \\ | \\ \vdots \\ | \\ For(Kuku'), Ty(e), ?\exists \mathbf{x}.Tn(\mathbf{x}) \end{array}$$

The tree in (8.5) represents the mental state of the hearer after the first item of the string has been parsed. It is known that the proposition involves the individual represented by *Kuku'*, but not what role this individual will play.

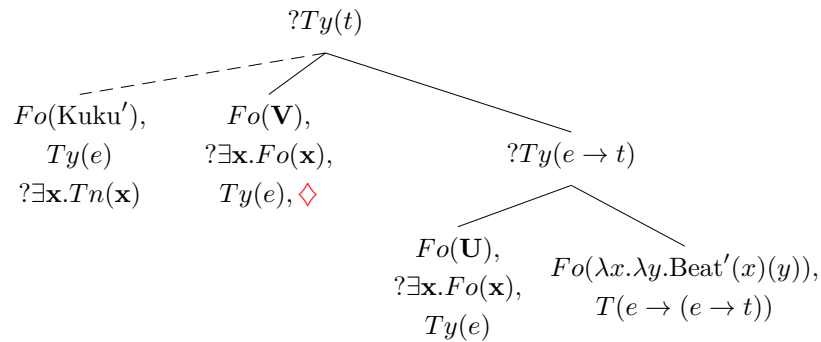
The next item to be parsed is the verb *abu*. The lexical entries of verbs are generally more complicated than those of proper nouns, providing both the semantic content of the predicate and a template of the proposition's argument structure. A lexical entry for *abu* is given in (8.6).² When the string /*abu*/ is encountered, the parser checks whether the node currently under development is a propositional node, i.e. whether there is a $?Ty(t)$ requirement on the node. If so, it constructs and decorates a partial tree according to the steps listed in (8.6) where $\langle \downarrow_1 \rangle$ indicates a functor daughter and $\langle \downarrow_0 \rangle$ indicates an argument daughter. For example, the first line of this set of actions constructs a functor daughter below the node where the pointer is currently located, then moves the pointer to that node and decorates it with a requirement for a formula of type $e \rightarrow t$ (i.e. a one-place predicate). The second and third lines then build a further functor daughter node and decorate it with the semantic content $\lambda x.\lambda y.\text{Beat}'(x)(y)$, (a type $e \rightarrow (e \rightarrow t)$ predicate), and so on.

(8.6) Lexical actions associated with *abu* (8.8):

abu	IF	$?Ty(t)$
	THEN	$\text{make}(\langle \downarrow_1 \rangle), \text{go}(\langle \downarrow_1 \rangle), \text{put}(?Ty(e \rightarrow t)),$ $\text{make}(\langle \downarrow_1 \rangle), \text{go}(\langle \downarrow_1 \rangle),$ $\text{put}(Fo(\lambda x.\lambda y.\text{Beat}'(x)(y)), Ty(e \rightarrow (e \rightarrow t))),$ $\text{go}(\langle \uparrow_1 \rangle), \text{make}(\langle \downarrow_0 \rangle), \text{go}(\langle \downarrow_0 \rangle), \text{put}(Fo(\mathbf{U}), ?\exists \mathbf{x}.Fo(\mathbf{x}), Ty(e)),$ $\text{go}(\langle \uparrow_0 \rangle), \text{go}(\langle \uparrow_1 \rangle), \text{make}(\langle \downarrow_0 \rangle), \text{go}(\langle \downarrow_0 \rangle),$ $\text{put}(Fo(\mathbf{V}), ?\exists \mathbf{x}.Fo(\mathbf{x}), Ty(e))$
	ELSE	abort

Applying these actions results to the partial tree in (8.5) results in a new partial tree (8.7). By convention arguments are represented as branching to the left and functors as branching to the right.

(8.7) Parsing *kúkkú abu*



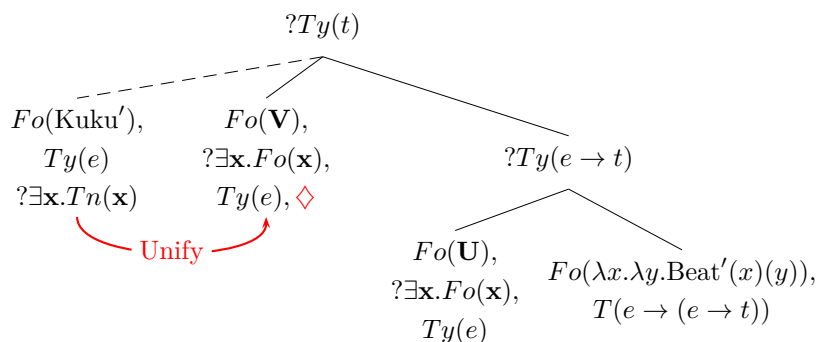
²I ignore subject agreement and tense for the sake of simplicity.

Like most contemporary syntactic theories, Dynamic Syntax is lexicalist – language variation resides in the lexicon – and (8.7) shows an example of this. The lexical actions in (8.6) reflect the fact that Katcha is a full pro-drop language by decorating the argument nodes with metavariables, represented as \mathbf{U} and \mathbf{V} . Metavariables are objects which act as placeholders for contentful Formula values. They do not constitute expressions in the epsilon/lambda calculi and so must be replaced by such an expression, this is marked formally by the requirement $?\exists\mathbf{x}.Fo(\mathbf{x})$. In this way, they satisfy a type requirement but replace it with a formula requirement. The formula requirement does not have to be fulfilled through a linguistic source. One way it may be done is through SUBSTITUTION, a pragmatic process in which a suitable referent is chosen from context. Thus (8.8) is a grammatical sentence. (In non-pro-drop languages the argument nodes are decorated merely with a type requirement ($?Ty(e)$), meaning that SUBSTITUTION is not a possibility and some lexical item is needed to provide the node with a value.)

(8.8) **abu**
 3M.beat
 ‘he hits him/her/it’

After constructing and decorating the propositional template, the lexical actions of the verb leave the pointer on the external argument node as in (8.7).³ The metavariable on this node can be resolved by indentifying the unfixed node and the external argument node. This is done by the computational action of UNIFICATION, which allows two type-identical nodes with compatible addresses and content to be brought together. The unfixed node has a defined formula value but an underspecified tree node address, while the external argument node has a defined position in the tree but an underspecified formula value. Both are type e , so they may be UNIFIED (8.9).

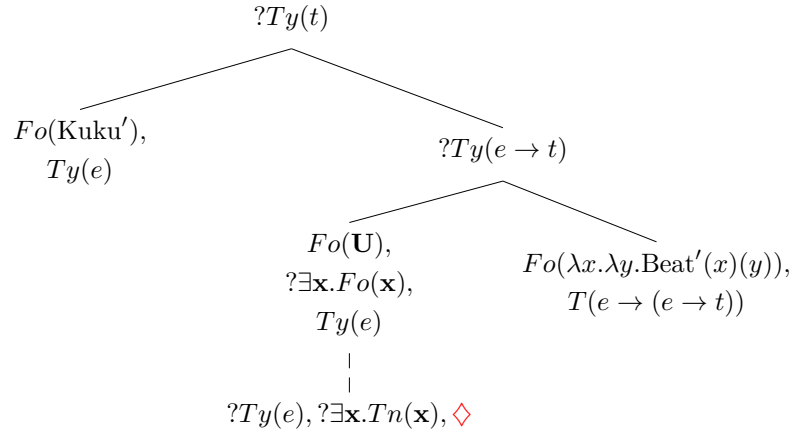
(8.9) Unification of unfixed node



³Where the pointer is left by the lexical actions of the verb is another point of language variation. That it is left on the external argument node reflects the fact that Katcha basic word order is either SVO or VSO.

With the external argument now fully specified and all requirements satisfied, the pointer may move to the node above. It may then move down the tree to a node with outstanding requirements, in this case the internal argument node, which is also decorated with a metavariable and requires a formula value. A computational action that may apply in this context is LATE *ADJUNCTION which builds an unfixed node below a fixed one provided they share type annotations. This rule therefore builds an unfixed node requiring type e from the internal argument node (8.10).

(8.10) Application of LATE *ADJUNCTION



The object *ambá* can now be parsed. The lexical actions of common nouns are taken to decorate the tree with epsilon terms which are discussed more fully in the following sections. These are terms made up of an operator, ϵ , which binds a variable within a proposition. An ϵ -term $\epsilon_x, F(x)$ represents ‘some x of which F holds’ and is related to predicate logic by the equivalence in (8.11). Epsilon terms are therefore objects of type e but with internal structure.

(8.11) $F(\epsilon_x, F(x)) \equiv \exists x.F(x)$

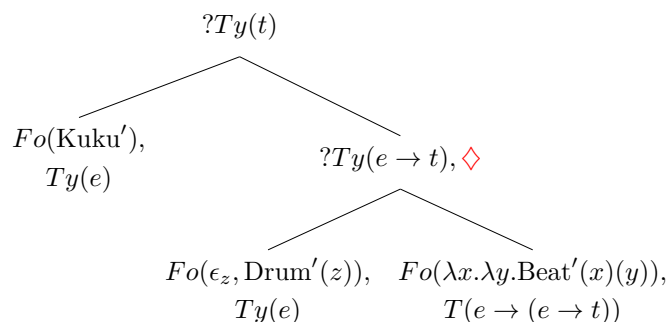
The internal structure of epsilon terms is important to the discussion in the following sections. For now though, it suffices to treat the epsilon term that represents the semantic content of *ambá* as a primitive, meaning that the lexical entry will be as defined in (8.12) and will simply decorate the type e requiring node with the type e term $\epsilon_z, Drum'(z)$.

(8.12) Lexical actions associated with *ambá*:

kókkó	IF	$?Ty(e)$
	THEN	$put(Fo(\epsilon_z, Drum'(z)), Ty(e))$
	ELSE	abort

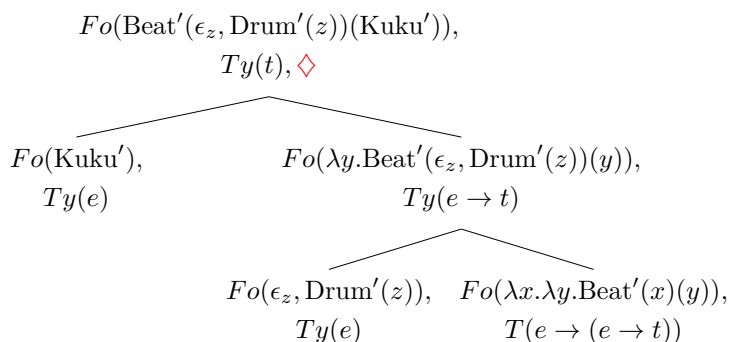
The lexical actions in (8.12) make the unfixed node type complete and the pointer may return to the node above. The node above is decorated with a metavariable and the unfixed node may UNIFY with it providing the internal argument node with its value (8.13).

(8.13) After parsing *kókkú abu ambá* and UNIFICATION of internal argument node



All the lexical items in the string have now been parsed and there are no outstanding requirements on the terminal nodes of the semantic tree, so it can now be evaluated. The pointer moves up the spine of the tree at each node combining the *Type* values of its daughters by Modus Ponens and the *Formula* values of its daughters by functional application. This leads to the completed final tree in (8.14).

(8.14) After parsing *kókkú abu ambá* and UNIFICATION of internal argument node



Tree (8.14) contains no outstanding requirements and is decorated at the root node with a propositional formula. It may be described as a logical form, and the parse has been successful. The propositional formula at the root node of the tree expresses the proposition (8.15a) which can be shown to be equivalent to (8.15b).⁴

⁴The equivalence is achieved through a process of scope evaluation (Kempson *et al.* 2001:241-243)

- (8.15) a. $\text{Beat}'(\epsilon_z, \text{Drum}'(z))(\text{Kuku}')$
 b. $\exists z. [\text{Drum}'(z) \wedge \text{Beat}'(z)(\text{Kuku}')]]$

Having now seen in detail the process of parsing an ordinary transitive verb, it is possible to go on to look at verb extensions in Katcha and see how these may be modelled within Dynamic Syntax.

8.2 Antipassive

- (8.16) kókkó íkícé-éné
 Kuku laugh.at-ANTIP
 ‘Kuku is laughing’

As noted in section 7.2.1, the antipassive indicates that the identity of the semantic theme/patient is unknown or unimportant to the point of non-existence. However, as also noted there, the basic form of Katcha verbs is transitive; to analyse a verb like *íkícé-éné* as a simple one-place predicate would seem to go against the general pattern of Katcha verbs.

The central insight in the analysis of a sentence like (8.16) therefore is that the antipassive provides the semantic object for the verb and that this object is indefinite, arbitrary and completely dependent on the immediate context of the predicate and its co-arguments in the given situation. In other words, the interpretation of (8.16) is something like ‘Kuku is laughing (at whatever it is that Kuku is laughing at in this instance)’. Such an analysis is proposed within CCG by Steedman (2011) for detransitivised verbs in English (such as ‘John is reading’), using dependent Skolem terms to represent the indefinite object. The Dynamic Syntax formalism, with its use of the epsilon calculus to represent noun phrases, is well-suited to this type of analysis. Furthermore, it is common within Dynamic Syntax to assume that propositions include an additional argument which stands for the situation of evaluation (Gregoromichelaki 2006, 2011; Cann 2011). This situation argument is assumed to be of type e_s , that is a subtype of type e . Cann (2011) argues that the semantic content of the situation argument, like all other arguments of a proposition, should be modelled as an epsilon term.⁵ For ease of exposition I ignore the internal content of the situation argument, simply representing its formula value as an indexed variable, s_i . Where appropriate I add informal restrictions, such as $s_{i, \text{EVENT}(i)}$ or $s_{i, \text{STATE}(i)}$. Incorporating this situation argument into our account allows us to express the context-dependent nature of the ‘missing’ object quite naturally.

⁵This allows features such as tense to be construed as a restrictor on the temporal relation between the event and the time of utterance or other reference point.

Taking these assumptions into account, the antipassive suffix can be construed as decorating the internal argument node with some contextually dependent epsilon term. In the case of sentence (8.16), this will be the term given in (8.17), leading to the logical form shown in (8.18):⁶

$$(8.17) \quad \epsilon_x, \text{Laugh.at}'(x)(\text{Kuku}')(s_i)$$

$$(8.18) \quad \begin{array}{c} \text{Fo}(\text{Laugh.at}'(a)(\text{Kuku}')(s_i)), \text{Ty}(t), \diamond \\ \swarrow \quad \searrow \\ \text{Fo}(s_i), \text{Ty}(e_s) \quad \text{Fo}(\text{Laugh.at}'(a)(\text{Kuku}')), \\ \quad \quad \quad \text{Ty}(e_s \rightarrow t) \\ \swarrow \quad \searrow \\ \text{Fo}(\text{Kuku}'), \text{Ty}(e) \quad \text{Fo}(\text{Laugh.at}'(a)), \\ \quad \quad \quad \text{Ty}(e \rightarrow (e_s \rightarrow t)) \\ \swarrow \quad \searrow \\ \text{Fo}(a), \quad \text{Fo}(\text{Laugh.at}'), \\ \text{Ty}(e) \quad \text{Ty}(e \rightarrow (e \rightarrow (e_s \rightarrow t))) \end{array}$$

$$\text{where } a = \epsilon_x, \text{Laugh.at}'(x)(\text{Kuku}')(s_i)$$

As noted in section 8.1, an epsilon term $\epsilon_x, F(x)$ represents some arbitrary individual, x , of which the property F holds. The epsilon term in (8.17), which forms the internal argument of the proposition at the root node of (8.18) represents the object of Kuku's laughing: some arbitrary x such that, in situation s_i , Kuku' laughs at x , in other words 'whatever it is Kuku is laughing at in this instance'. Importantly (given the semantics of the antipassive discussed in section 7.2.1), this term is completely dependent on the immediate context of the tree in which it occurs, drawing its content from the formula values of the other terminal nodes in the tree.

The lexical actions associated with the antipassive suffix (8.19) achieve this context dependence by copying formula values from elsewhere in the partial tree. This lexical entry states that the pointer must be at the logical subject node (that is, a type e node whose mother is of type $e_s \rightarrow t$) and that there must be some formula σ of type e_s decorating the situation argument node and some formula ϕ of type $e \rightarrow (e \rightarrow (e_s \rightarrow t))$ decorating the predicate node. If these conditions are met, the pointer moves to the logical object node and decorates it with an epsilon term which incorporates the formula value of the predicate (ϕ) as its restrictor and the values of the situation argument (σ) and logical subject (α) as arguments:

⁶In order to declutter the tree diagrams, I suppress the λ -operators and their bound variables when representing predicate formulae. Thus in (8.18) the formula $\text{Laugh.at}'$ should be taken as an abbreviation for $\lambda x. \lambda y. \text{Laugh.at}'(x)(y)$. Functors always appear to the right of their arguments in the tree, and semantic types are stated explicitly on each node, so this should not lead to any ambiguity.

(8.19)	Lexical entry for antipassive -VnV	
	-VnV	IF $Ty(e), Fo(\alpha), \langle \uparrow_0 \rangle ? Ty(e_s \rightarrow t)$ $\wedge \langle \uparrow_0 \rangle \langle \uparrow_1 \rangle \langle \downarrow_0 \rangle Fo(\sigma), Ty(e_s)$ $\wedge \langle \uparrow_0 \rangle \langle \downarrow_1 \rangle \langle \downarrow_1 \rangle Fo(\phi), Ty(e \rightarrow (e \rightarrow (e_s \rightarrow t)))$ THEN $go(\langle \uparrow_0 \rangle \langle \downarrow_1 \rangle \langle \downarrow_0 \rangle),$ $put(Fo(\epsilon_x, \phi(x)(\alpha)(\sigma)), Ty(e))$ ELSE abort

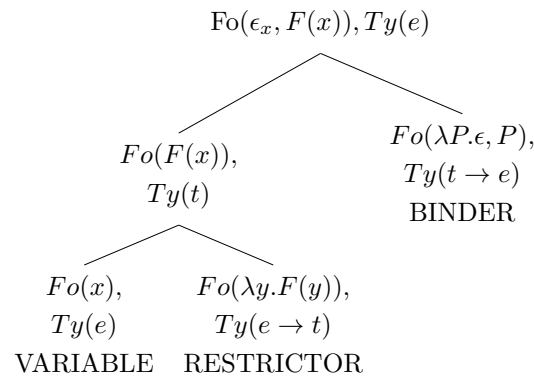
As a verbal suffix, the antipassive marker is parsed after the verb root. It is straightforward to specify the value of ϕ because the predicate node will have been decorated with a formula value when the verb root was parsed. The lexical actions in (8.19) can then easily refer to this value and incorporate it into the epsilon term with which it decorates the logical object node. Likewise, I assume that the situation argument has some fixed content, and copying this value (σ) into the epsilon term is equally straightforward.

Specifying the value of the agent (α) is more problematic. At the point when the antipassive morpheme is parsed, this value may well be merely a metavariable. The lexical actions in (8.19) would then incorporate this metavariable into the epsilon term to give a formula such as (8.20).

$$(8.20) \quad \epsilon_x, \text{Laugh.at}'(x)(\mathbf{U})(s_i).$$

(8.20) represents ‘the object of \mathbf{U} ’s laughter in s_i .’ The problem with this is that a metavariable has no semantic content; it is merely a placeholder for some formula. Moreover, as an argument within the epsilon term, the metavariable \mathbf{U} in (8.20) is not available for substitution and hence the entire epsilon term is uninterpretable. It is therefore not enough for the lexical actions in (8.19) to decorate the logical object node with an unexpanded epsilon term. Instead, they must make reference to the fact that epsilon terms have internal structure.

In an ϵ -term $\epsilon_x, F(x)$, F is a restrictor function over the free variable x . ϵ is an operator which binds x and turns the proposition $F(x)$ into a term. It is possible to represent all of this schematically using a DS-style tree notation (8.21). As is standard, functors are on the right and arguments on the left.

(8.21) Structure of an epsilon term⁷

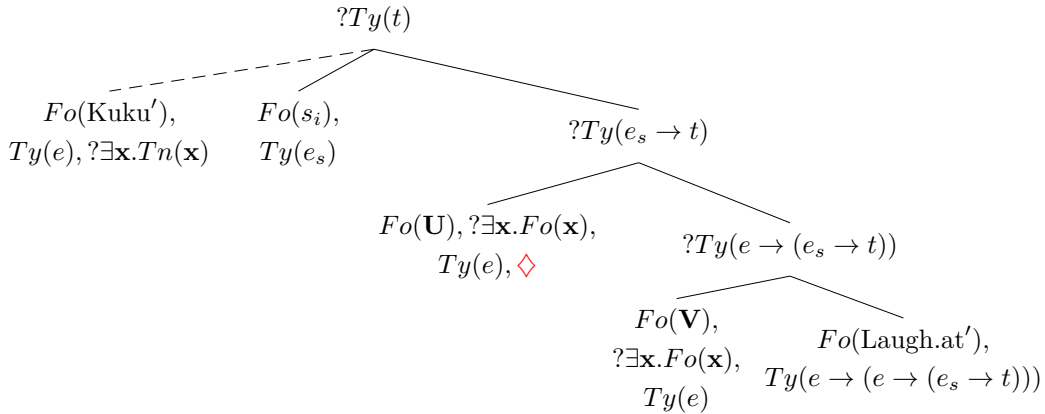
The lexical entry for the antipassive morpheme can be adjusted so that rather than just decorating the logical object node with a formula value, it constructs a full epsilon structure of the kind represented in (8.21). The revised lexical entry is given in (8.22). At first, the structure built by these actions looks rather different from the standard epsilon structure in (8.21). However, the difference is only apparent. The epsilon binder is of type $t \rightarrow e$, predicating over an open proposition. For the majority of epsilon structures, such as those projected by quantified noun phrases, the open proposition describes a property of the unbound variable, because the common noun projects a one-place predicate. But there is nothing in principle to limit this proposition to describing a property. In the current case, the predicate within the epsilon term is a copy of the three-place predicate projected by the verb and so the open proposition describes a three-place relation in which the unbound variable participates.

⁷The version of epsilon structure in Kempson *et al.* (2001); Cann *et al.* (2005) has slightly different formula and type values to the version I give here.

(8.22) Lexical entry for antipassive **-VnV** (revised)

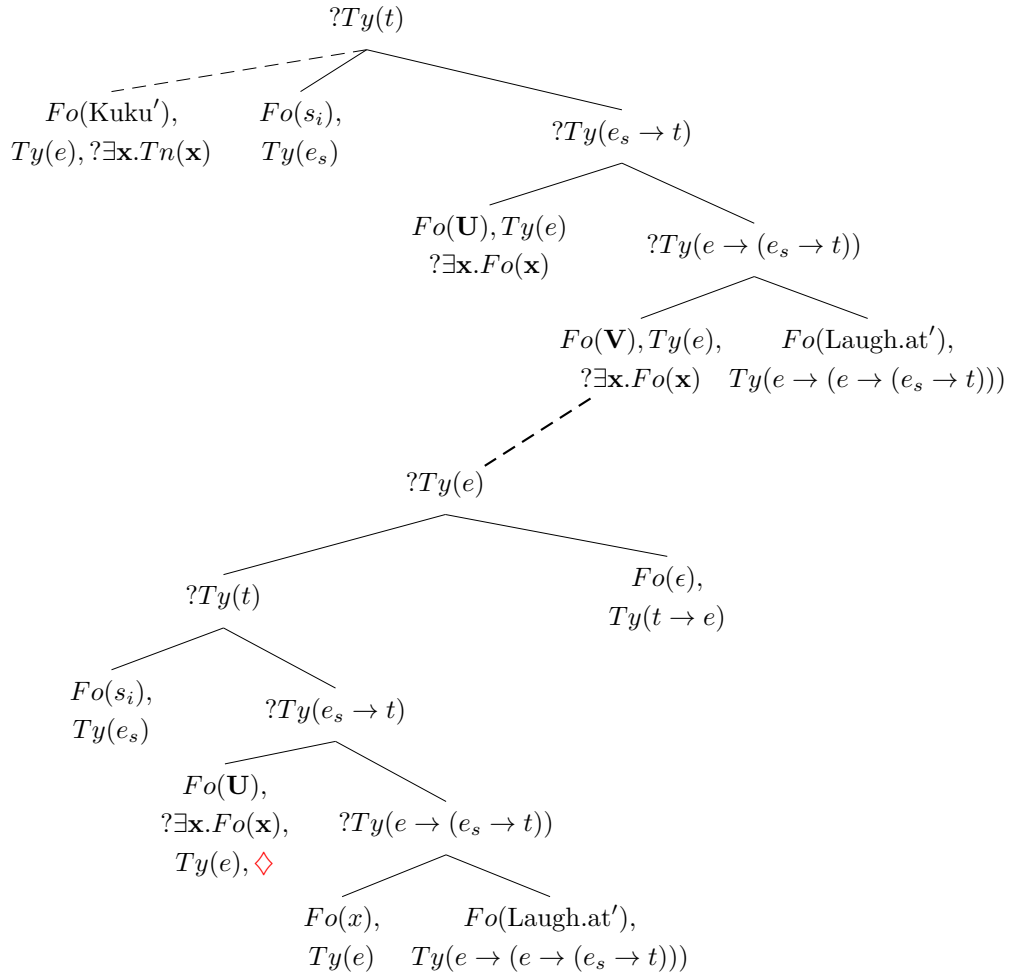
IF	$Ty(e), Fo(\alpha), \langle \uparrow_0 \rangle ?Ty(e_s \rightarrow t)$ $\wedge \langle \uparrow_0 \rangle \langle \uparrow_1 \rangle \langle \downarrow_0 \rangle Fo(\sigma), Ty(e_s)$ $\wedge \langle \uparrow_0 \rangle \langle \downarrow_1 \rangle \langle \downarrow_1 \rangle Fo(\phi), Ty(e \rightarrow (e \rightarrow (e_s \rightarrow t)))$
THEN	$go(\langle \uparrow_0 \rangle \langle \downarrow_1 \rangle \langle \downarrow_0 \rangle),$ $make(\langle \downarrow_* \rangle), go(\langle \downarrow_* \rangle), put(?Ty(e)),$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(Fo(\epsilon), Ty(t \rightarrow e)), go(\langle \uparrow_1 \rangle),$ $make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(?Ty(t)),$ $make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(Fo(\sigma), Ty(e_s)), go(\langle \uparrow_0 \rangle),$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(?Ty(e_s \rightarrow t)),$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(?Ty(e \rightarrow (e \rightarrow (e_s \rightarrow t)))),$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(Fo(\phi), Ty(e \rightarrow (e \rightarrow (e_s \rightarrow t))))),$ $go(\langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), freshput(Fo(x), Ty(e)),$ $go(\langle \uparrow_0 \rangle), go(\langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle),$ $go(\langle \downarrow_0 \rangle), put(Fo(\alpha), Ty(e), ?\exists x.Fo(x))$
-VnV	
ELSE	abort

To exemplify this, it is worth considering how the parse of (8.16) proceeds incrementally. After parsing the subject and verb, the partial tree in (8.23) has been constructed, with the pointer on the subject node where it is left by the lexical actions of the verb.

(8.23) Parsing *kúkkú íkící*

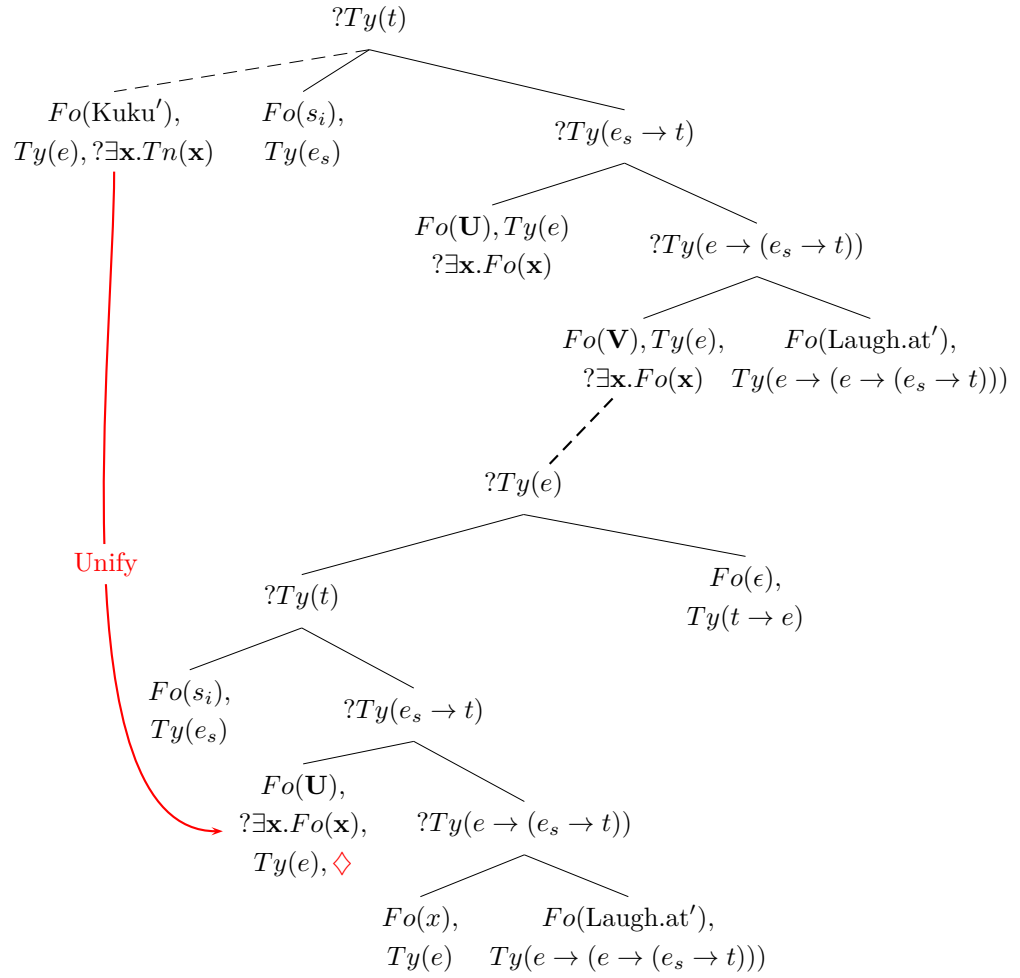
(8.23) provides the context in which the antipassive suffix is parsed, and the lexical actions of (8.22) are carried out. The actions move the pointer to the logical object node from where an unfixed node requiring a term is constructed. The skeleton of the epsilon structure is built and decorated with copies of the formulae as specified by the lexical actions. Applying these actions in the context of (8.23) generates the tree in (8.24).

(8.24) Parsing kúkkú íkícééné

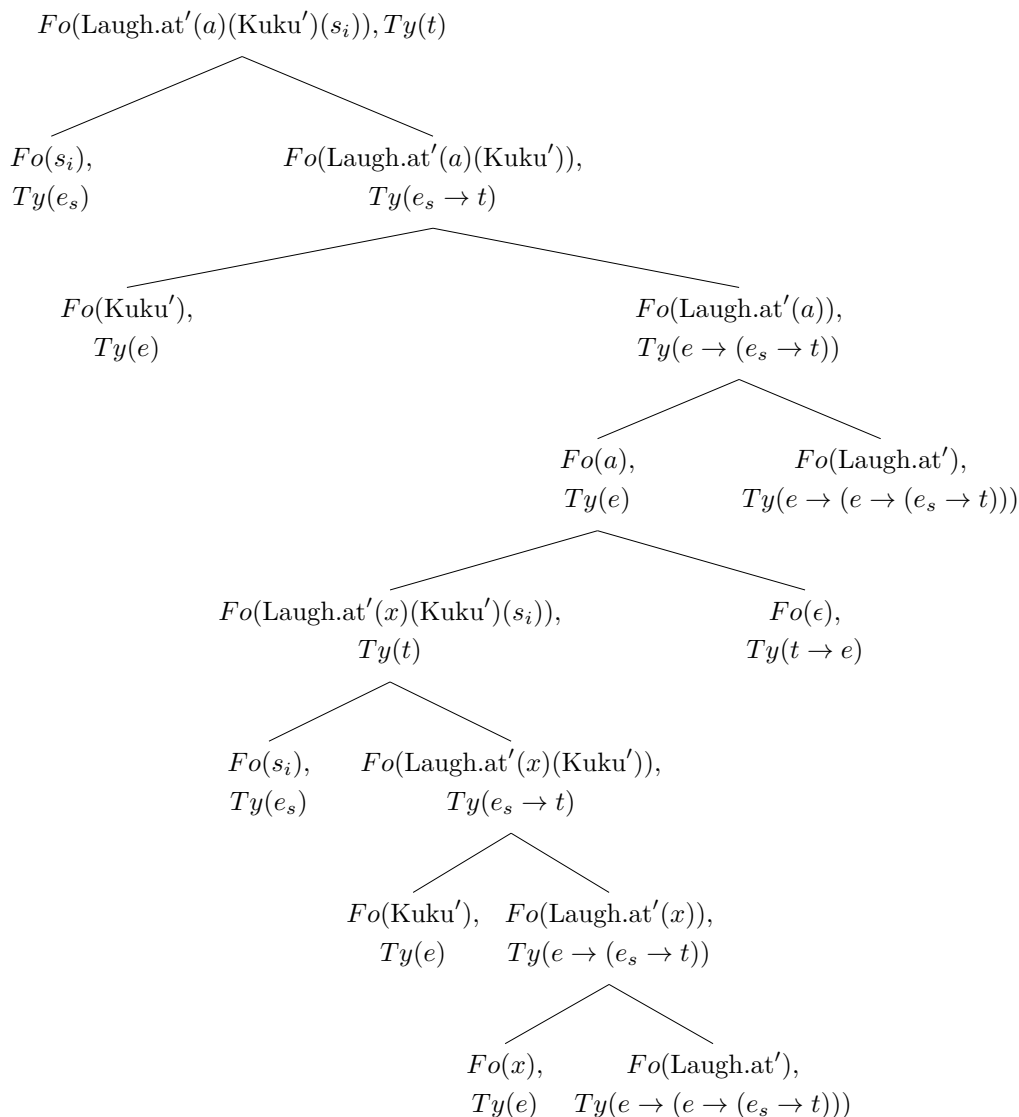


All the lexical material in (8.16) has now been parsed and the main task remaining is to resolve the outstanding requirements, including instantiating the metavariables. With the pointer sitting on the epsilon-internal logical subject node, this can be immediately instantiated by unification with the unfixed node decorated with $Fo(Kuku')$. This is a slightly surprising turn of events, in that ‘Kuku’ is the sentential subject and would therefore be expected to decorate the matrix subject node, but here it is unified with the ‘subject’ node which is internal to the matrix object. However, this is not a problem since the two nodes are linked by the copy mechanism, so must end up being decorated with the same Formula value. It just happens to be that the incremental nature of Dynamic Syntax entails the lower node be instantiated first (8.25).

(8.25) Applying UNIFY



The tree can now be duly compiled, with the root of the epsilon tree being decorated with the formula $\epsilon_x, Laugh.at'(x)(Kuku')(s_i)$, some arbitrary x that Kuku laughs at in situation s_i . This UNIFIES with the logical object node, providing the object with its Formula value. The rest of the tree compiles as normal, with the metavariable on the logical subject node being updated with the value that was established during the interpretation of the epsilon term.

(8.26) Final tree for **kúkkú íkícíéné**

where $a = \epsilon_x, \text{Laugh.at}'(x)(\text{Kuku}')(\mathit{s}_i)$

The tree in (8.26) has a distinctly recursive look to it. As is standard, the completed tree is a type t proposition and its arguments are type e epsilon terms. However, epsilon terms contain propositions within them, and in (8.26) the proposition within the logical object is virtually identical to the matrix proposition because its value is built up entirely from the immediate context. The semantic contribution of the object is simply the fact that it is the object of the proposition. Thus the formula decorating the root node of the propositional tree is (8.27) which expresses the proposition that Kuku laughs at a , where a is some arbitrary thing that Kuku laughs at. This proposition is truth conditionally equivalent to $\exists x[\text{Laugh.at}'(x)(\text{Kuku}')(\mathit{s}_i)]$.

$$(8.27) \text{ Laugh.at}'(a)(\text{Kuku}')(s_i),$$

where $a = \epsilon_x, \text{ Laugh.at}'(x)(\text{Kuku}')(s_i)$

The Dynamic Syntax formalism, and its use of epsilon calculus in particular, thus enables us to model the intuition that a detransitivised verb (marked in Katcha by an antipassive suffix) expresses the action of an agent on some object, but that the identity of this object is both irrelevant to the proposition expressed and entirely dependent on the context. In essence, the object's only semantic content is the fact that it is the object of the predicate.

In section 7.2.1 it was noted that, according to Stevenson (1941:58), it *is* possible for antipassive verbs to appear with 'indefinite objects', leading to a generic or object-incorporating interpretation (7.16). This data does not necessarily conflict with the analysis given here, since the apparent object does not take its canonical thematic role: it is not the patient of the action described by the verb. One possibility might be that the lexical object is LINKed to the main propositional tree, providing some additional semantic content.⁸ So (7.16) 'the boy cow-milks' might in fact be structured as something like (8.28): 'the boy milks some arbitrary object of his milking, and the arbitrary object of the boy's milking are cows'.

$$(8.28) \text{ Milk}'(a)(\text{Boy}') \wedge \text{Cow}'(a)$$

$a = \epsilon_x, \text{ Milk}'(x)(\text{Boy}')$

This possibility seems plausible, but it is based on only one piece of written data from the Stevenson archive and is therefore largely speculative.

8.3 Passive

The subject of a Passive sentence is the patient/theme. So in (8.29), the passive morphology indicates that **kuri** will be interpreted as the logical object.

$$(8.29) \text{ kuri uni-tené}$$

food cook-PASS

'some food is being cooked'

The lexical actions projected by the passive morphology therefore serve to ensure that the pointer is left on the logical object node. The subject can then be processed in the usual way, which means it will decorate the internal argument node.

There are two strategies that could be used to encode this.

The first is to treat passive verbs as lexical items and parse the verb and suffix together as a unit (8.30). This would treat passive verbs as having a different set of

⁸See chapter 9 for discussion of the LINK relation.

lexical actions from their active counterparts (and therefore necessitate an additional lexical entry for each verb):

(8.30) Lexical entry for passive verb *unitené*

<i>unitené</i>	IF	$?Ty(t)$
	THEN	$\text{make}(\langle \downarrow_0 \rangle), \text{go}(\langle \downarrow_0 \rangle), \text{put}(Fo(\mathbf{V}), ?\exists \mathbf{x}. Fo(\mathbf{x}), Ty(e))$ $\text{go}(\langle \uparrow_0 \rangle), \text{make}(\langle \downarrow_1 \rangle), \text{go}(\langle \downarrow_1 \rangle), \text{put}(?Ty(e \rightarrow t)),$ $\text{make}(\langle \downarrow_1 \rangle), \text{go}(\langle \downarrow_1 \rangle), \text{put}(Fo(\text{Cook}'), Ty(e \rightarrow (e \rightarrow t))),$ $\text{go}(\langle \uparrow_1 \rangle), \text{make}(\langle \downarrow_0 \rangle),$ $\text{go}(\langle \downarrow_0 \rangle), \text{put}(Fo(\mathbf{U}), ?\exists \mathbf{x}. Fo(\mathbf{x}), Ty(e)),$
	ELSE	abort

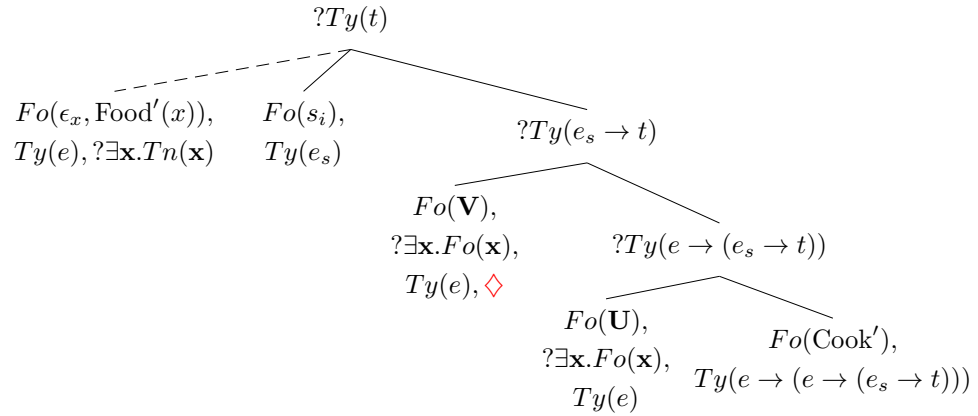
The second approach is to assume that the verb is parsed as normal and then the passive suffix is parsed separately. The suffix then simply has the effect of moving the pointer from the external argument node to the internal argument node (8.31):

(8.31) Lexical entry for passive suffix *-tené*

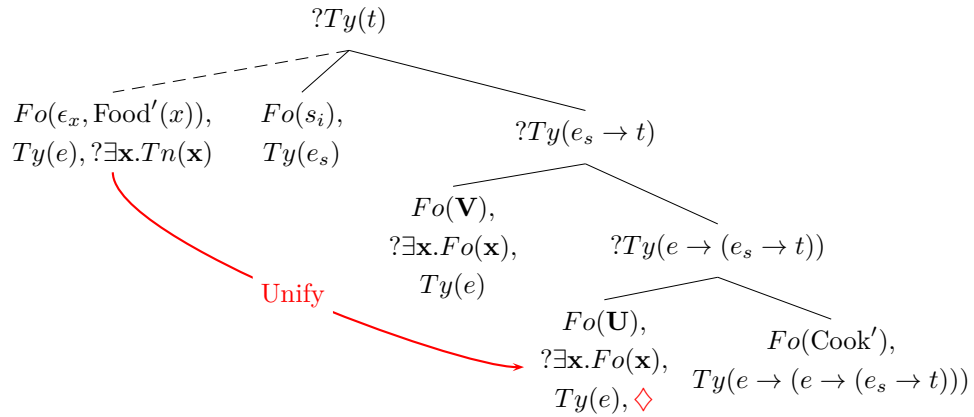
<i>-tené</i>	IF	$Ty(e), ?\exists \mathbf{x}. Fo(\mathbf{x}), \langle \uparrow_0 \rangle ?Ty(e_s \rightarrow t)$
	THEN	$\text{go}(\langle \uparrow_0 \rangle \langle \downarrow_1 \rangle \langle \downarrow_0 \rangle)$
	ELSE	abort

At this stage there is no clear reason not to assume the latter, compositional approach. In this case the lexical actions associated with the passive suffix (8.31) check that the pointer is on the logical subject node ($\langle \uparrow_0 \rangle ?Ty(e_s \rightarrow t)$) and that it still requires a formula value ($?\exists \mathbf{x}. Fo(\mathbf{x})$). The latter condition prevents a successful parse of the passive suffix where the logical subject node has already been decorated by the preverbal syntactic subject. In other words, a verb marked with a passive suffix is incompatible with the syntactic subject being interpreted as agent. If these conditions are met, the lexical actions simply move the pointer on to the logical object node, and then the parse proceeds as for transitive verbs. Thus in parsing (8.29), the subject and verb are parsed, giving the tree in (8.32).⁹ The passive suffix is then parsed and its actions move the pointer to the logical object node, where the metavariable may be resolved by unification with the unfixed node, as in (8.33).

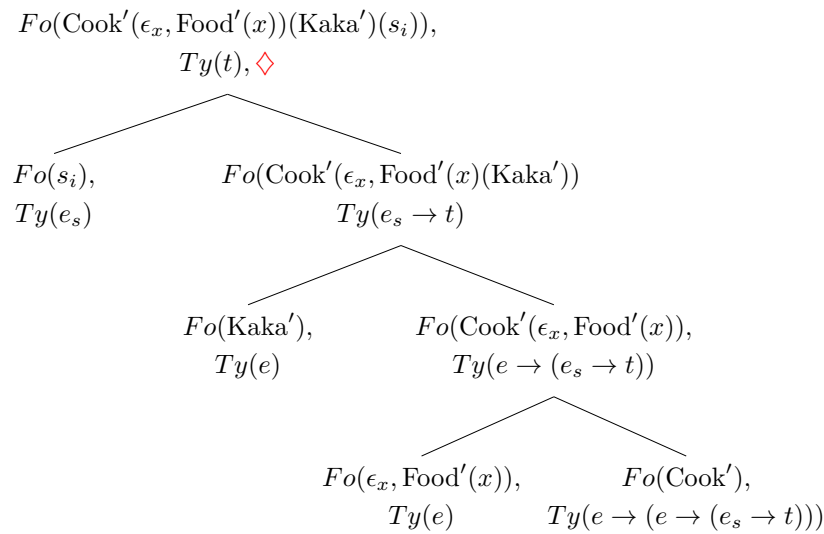
⁹The internal structure of the term projected by the syntactic subject, $\epsilon_x, \text{Food}'(x)$, is not relevant, so it is suppressed for clarity. As usual lambda operators and their variables are also suppressed.

(8.32) Parsing subject and verb (**kuri uni**)

(8.33) Parsing passive suffix, then application of UNIFY



Having fulfilled all requirements on the internal argument node the tree can be compiled in the usual manner. The external argument node is unaffected by the passive: it remains decorated by a metavariable and a formula requirement. An appropriate referent for the agent therefore has to be found, substituted from context if there is no suitable linguistic referent. This characterisation of the passive therefore ensures that there is always a referential argument reading for the agent, i.e. that there is always a semantic agent, even if this is only implied. Once the agent node is decorated with an appropriate agent the final logical form is as in (8.34), which is of course truth-conditionally equivalent to its active counterpart.

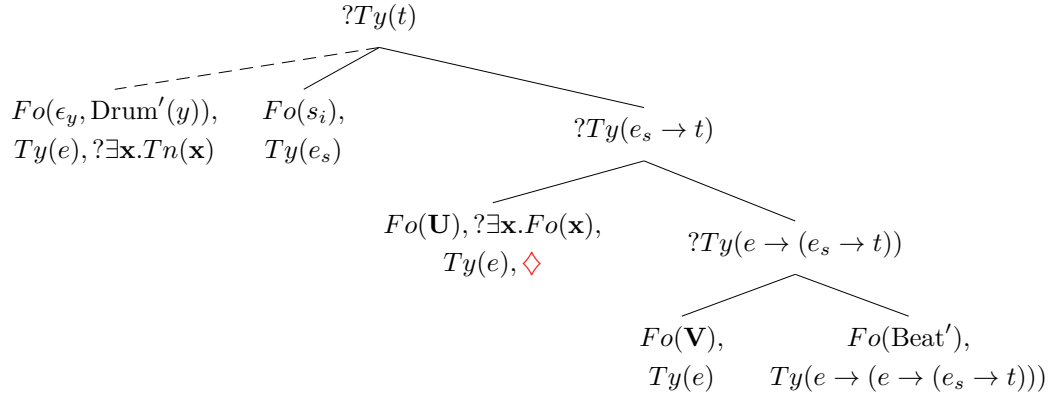
(8.34) Final tree for *kuri uni-tené*

8.4 Unaccusative

(8.35) *ambá m-abu-nca kâ tabe:né*
 drum 3F-beat-UNACC LOC wrestling
 ‘drums are hit for wrestling (habitually)’

The lexical actions associated with the unaccusative directly correlate with those of the antipassive. The difference of course, is that unaccusative constructions are ‘agentless’ rather than ‘patientless’, that is, the unaccusative decorates the logical subject node rather than the logical object node with a value indicating an individual which is indefinite, arbitrary and context-dependent.

In processing a sentence such as (8.35), after parsing the subject and verb, we have the partial tree in (8.36), with a type *e* term projected by the subject decorating an unfixed node, and the pointer sitting on the logical subject node:

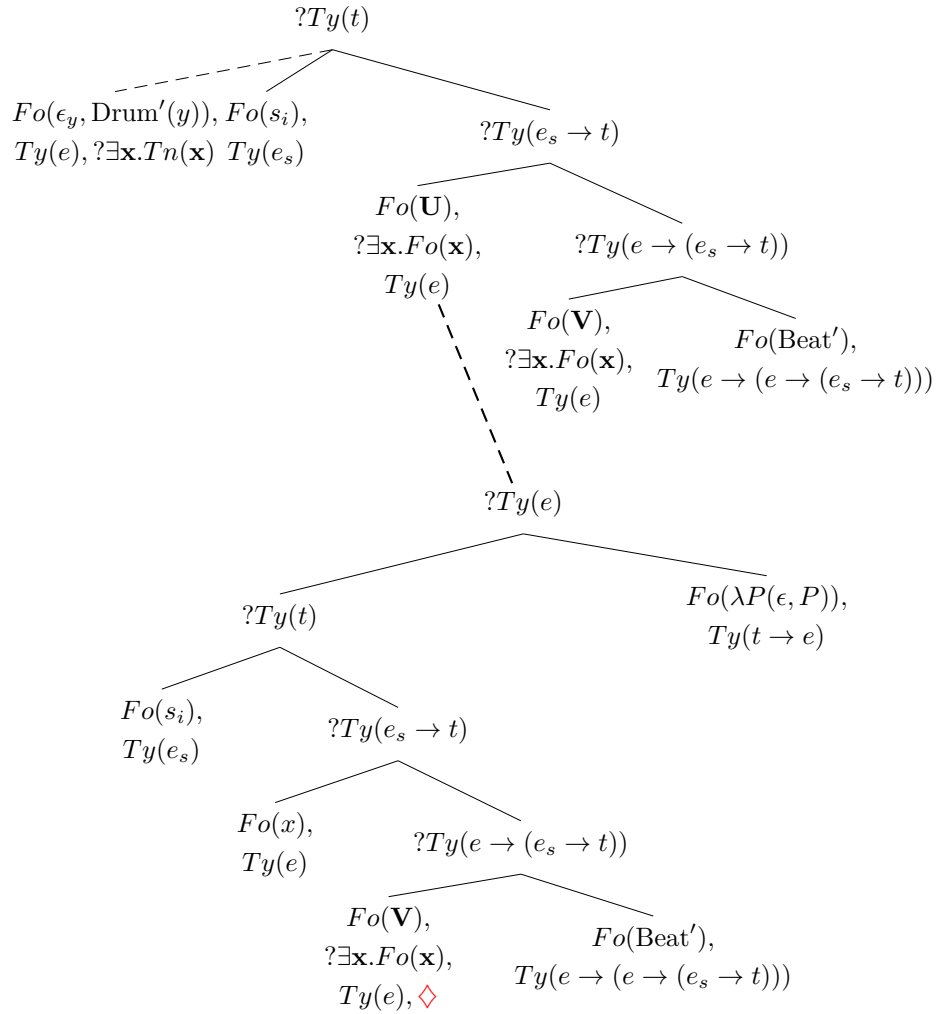
(8.36) Parsing *ambá mabu*

The unaccusative suffix is then parsed. In the same way that the antipassive does for the logical object, the lexical actions associated with the unaccusative morpheme build an epsilon structure from the logical subject node. This epsilon structure has propositional content whose sub-components are copied from the predicate, logical object and situation argument nodes of the tree. These lexical actions are given in (8.37):

(8.37) Lexical entry for unaccusative suffix *-nca*

-nca	IF $Ty(e), ?\exists \mathbf{x}. Fo(\mathbf{x}), \langle \uparrow_0 \rangle ?Ty(e_s \rightarrow t)$ $\wedge \langle \uparrow_0 \rangle \langle \downarrow_1 \rangle \langle \downarrow_1 \rangle Fo(\phi), Ty(e \rightarrow (e \rightarrow (e_s \rightarrow t)))$ $\wedge \langle \uparrow_0 \rangle \langle \downarrow_1 \rangle \langle \downarrow_0 \rangle Fo(\alpha), Ty(e)$ $\wedge \langle \uparrow_0 \rangle \langle \uparrow_1 \rangle \langle \downarrow_0 \rangle Fo(\sigma), Ty(e_s)$ THEN $make(\langle \downarrow_* \rangle), go(\langle \downarrow_* \rangle), put(?Ty(e)),$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(\lambda P(\epsilon, P)), go(\langle \uparrow_1 \rangle),$ $make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(?Ty(t)),$ $make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(Fo(\sigma), Ty(e_s)), go(uz),$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(?Ty(e_s \rightarrow t)),$ $make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(Fo(\alpha), Ty(e), ?\exists \mathbf{x}. Fo(\mathbf{x})), go(uz),$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(?Ty(e \rightarrow (e_s \rightarrow t))),$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(Fo(\phi), Ty(e \rightarrow (e \rightarrow (e_s \rightarrow t))))),$ $go(\langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), freshput(Fo(x), Ty(e)), go(\langle \uparrow_0 \rangle)$ ELSE abort
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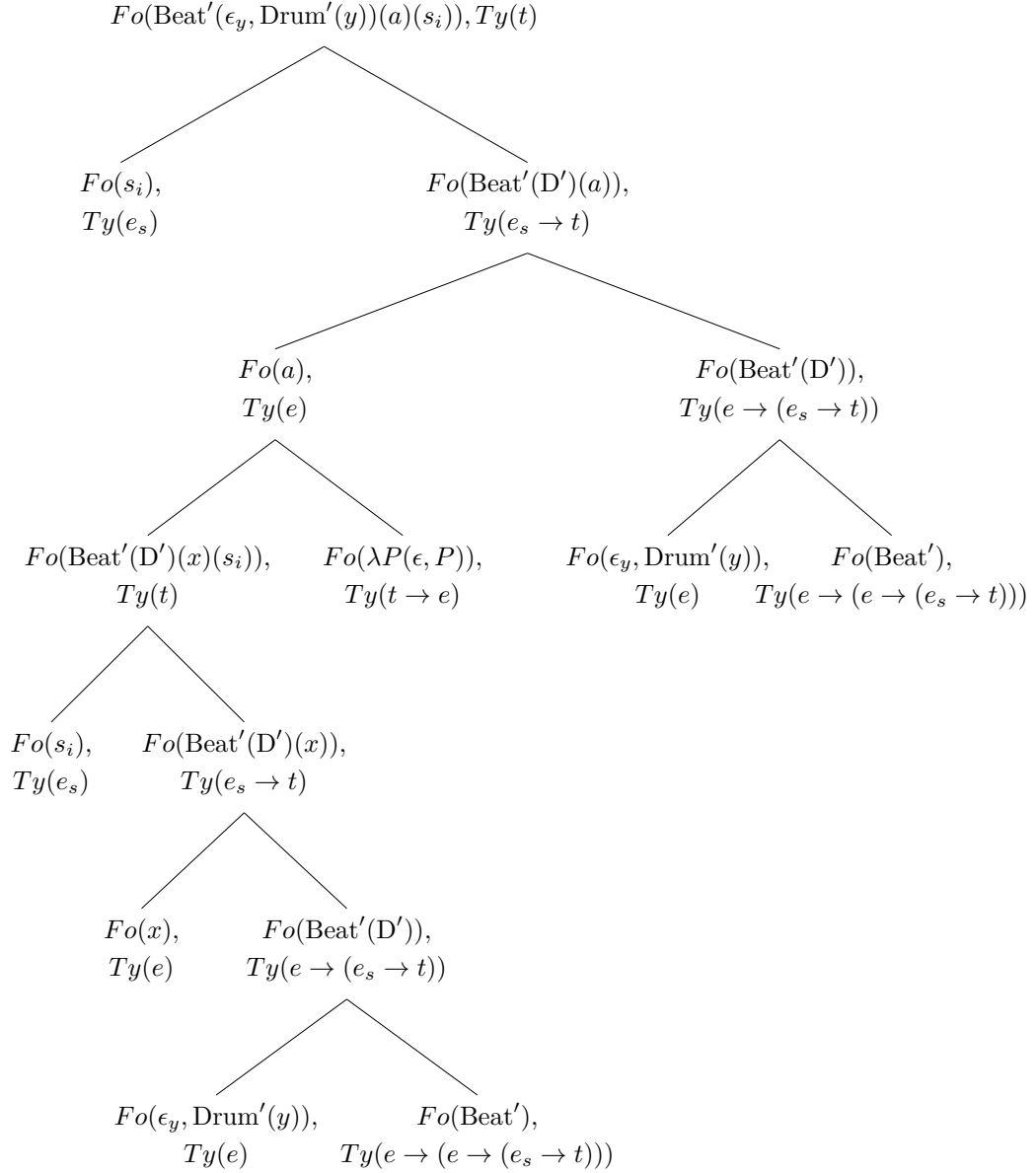
Applying the lexical actions in (8.37) in the context of (8.36) produces the tree in (8.38).

(8.38) Parsing *ambá mabunca*

With the pointer on a node requiring a formula value, the unfixed node projected by the syntactic subject can instantiate the metavariable. As was the case with the antipassive, the node it unifies with happens to be the logical object node of the epsilon term rather than of the matrix proposition, but this is of no consequence because the two nodes are linked by the copy mechanism, so will end up being decorated with the same Formula value. It just happens to be that the incremental nature of Dynamic Syntax entails the lower node be instantiated first. The tree can now be compiled as normal, the pointer working its way up the tree compiling the epsilon term to decorate the logical subject node of the propositional tree. The requirement for a formula value on the propositional object node means that the pointer has to move down to that node to update the metavariable there, which it will do using the value that has been established for \mathbf{V} during the process of constructing the epsilon term. The final tree for (8.35) is then as shown in (8.39) (with $\epsilon_y, \text{Drum}'(y)$ abbreviated to D'), the root

node decorated with a formula expressing the proposition that drums are beaten by a in situation s_i , where a is some arbitrary beater of drums in s_i .

(8.39) Final tree for **ambá mabunca**



where $a = \epsilon_x, \text{Beat}'(\epsilon_y, \text{Drum}'(y))(x)(s_i)$

8.5 Middle Voice

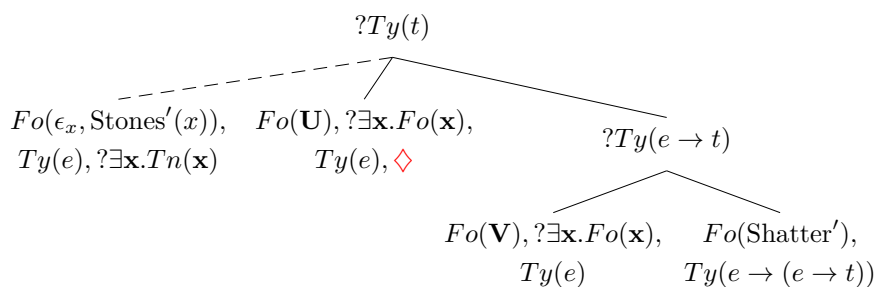
- (8.40) a neekisī tüürütü kasannanjaana ku'bu
 a nek-isi t-urutu k-asan:a-nca:na kuʁu
 SUBJ PL-stone INF-collapse 3P-shatter-MID down
 ‘the rocks split apart’ (MATT 27.51)

In section 7.2.4 it was suggested that although middles express the notion that the subject is both ‘initiator’ and ‘endpoint’, they express a single event with a single participant, in which the subject is primarily the patient. In this way, they are semantically similar to unaccusatives, a fact brought out in table 8.1. If table 8.1 represents an accurate characterisation of the semantics of middles *vis-a-vis* unaccusatives, it seems likely that the basic argument structure of the two forms will be the same. If the primary difference between them is one of *achievement* vs *process*, this is a verbal property that falls outwith the scope of the current study but will in all likelihood be reflected in the properties of the situation argument.

In section 7.2.5, it was noted that the form of the middle suffix *-nca:na* looks like a concatenation of unaccusative *-nca* followed by antipassive *-VnV*, and it was also noted that Stevenson (1941:112) claimed the *-VnV* suffix could mark intensification. Both of these possibilities were deemed less likely than an analysis of *-nca:na* as a single morpheme marking middle voice. Nonetheless, pursuing a compositional analysis of the middle morpheme in which it is construed as being made up of unaccusative *-nca* followed by antipassive *-VnV* provides some surprising results and turns out to be worthwhile.

Ignoring for simplicity both the situation argument and the internal complexity of the verb phrase in (8.40), the parse of a subject followed by a middle-marked verb would begin by parsing the subject and verb stem in the normal manner (8.41).

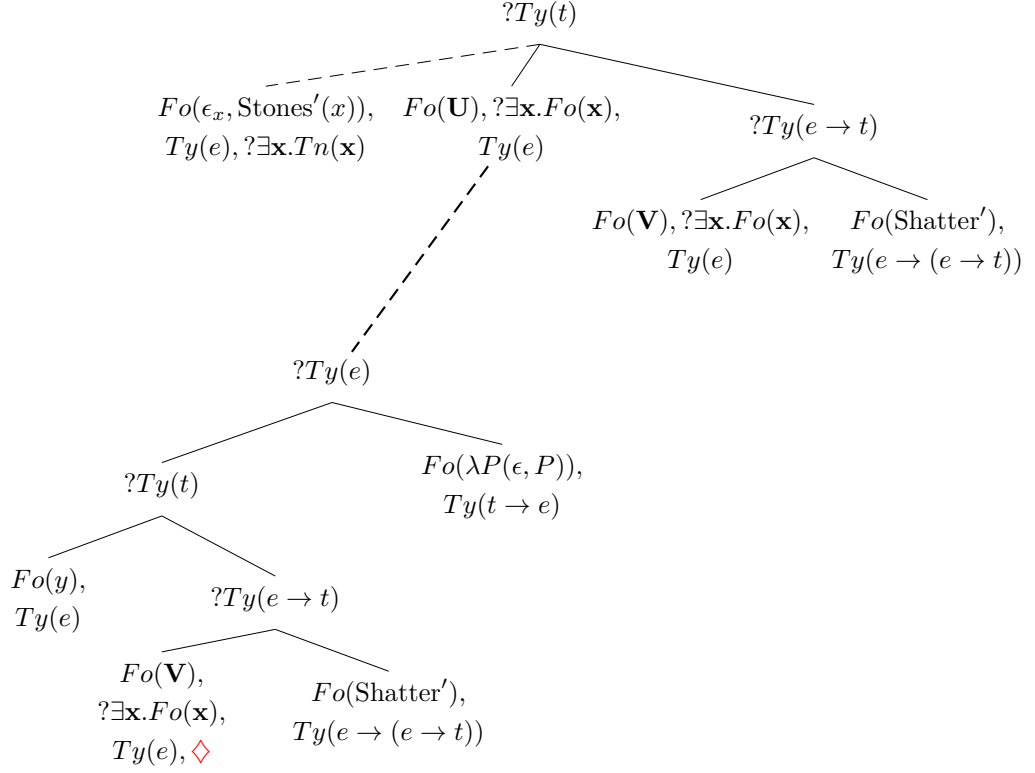
- (8.41) Parsing nekisi kasan:a



The unaccusative suffix *-nca* is then parsed using the lexical entry in (8.37). The lexical actions associated with this morpheme build an epsilon structure from the logical

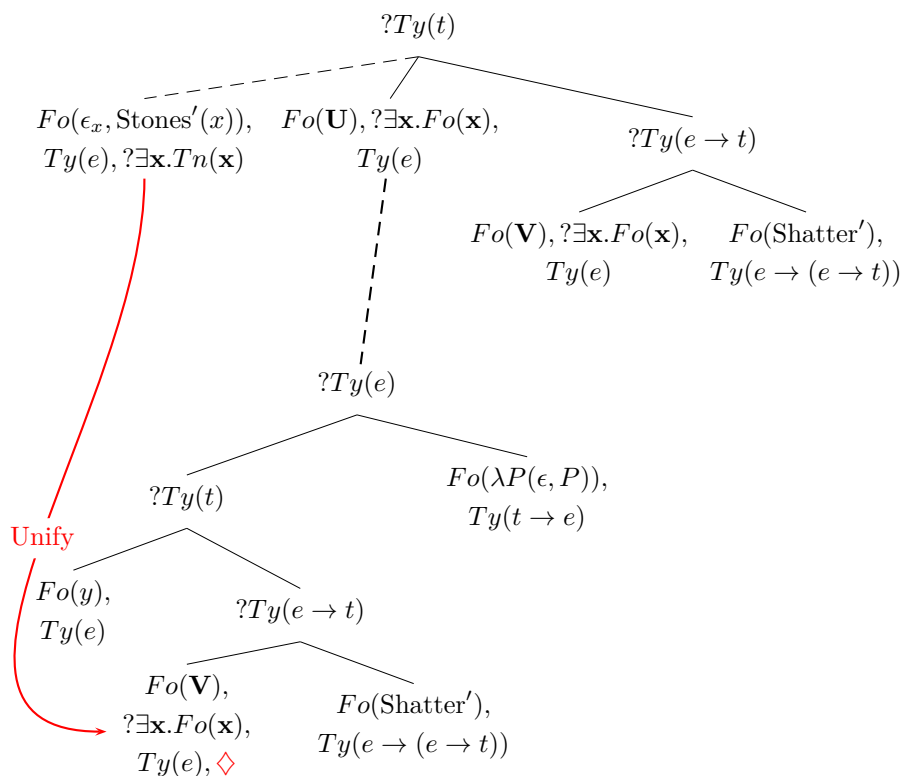
subject node. This epsilon structure has propositional content whose sub-components are copied from the predicate and logical object nodes of the tree (8.42).

(8.42) Parsing *ne:kisi kasan:a-nca*



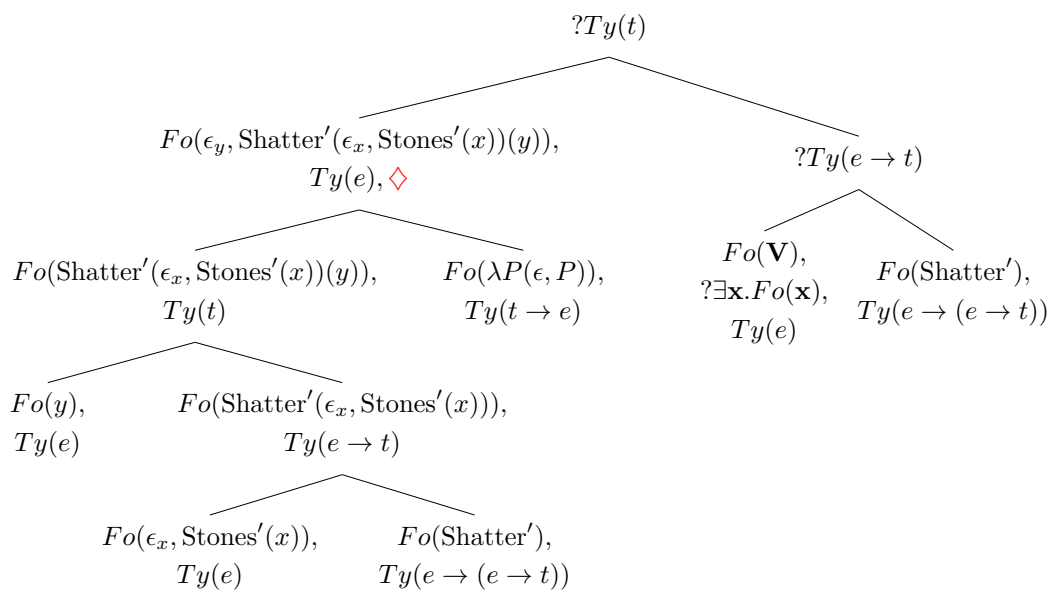
With the pointer on a node requiring a formula value, the unfixed node projected by the syntactic subject can instantiate the metavariable (8.43).

(8.43) Unification of unfixed node



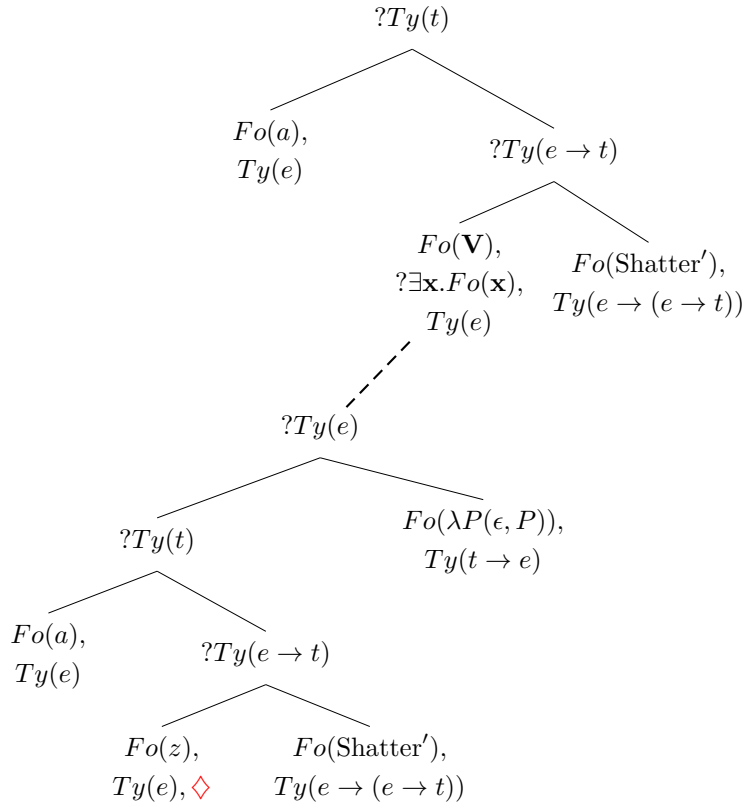
The epsilon term can now be compiled as normal, providing a Formula value for the logical subject node of the propositional tree (8.44). This value is what would be expected from an unaccusative: $\epsilon_y, \text{Shatter}'(\epsilon_x, \text{Stones}'(x))(y)$, some arbitrary stone-shatterer.

(8.44) Compiling logical subject



At this point in the parse, the pointer is sitting on a decorated logical subject node. That is, the node is of type e , has a Formula value and is the argument daughter of a propositional node. It therefore meets all the conditions required to carry out the actions associated with the antipassive morpheme $-VnV$. As noted in section 8.2, these actions move the pointer to the logical object node from where an unfixed node requiring a term is constructed. The skeleton of the epsilon structure is built and decorated with copies of the formulae from the logical subject node and the predicate node as well as a fresh variable on the epsilon tree's logical object node. Applying these actions in the context of (8.44) generates the tree in (8.45).¹⁰

(8.45) Parsing *ne:kisi kasan:anca-ana*

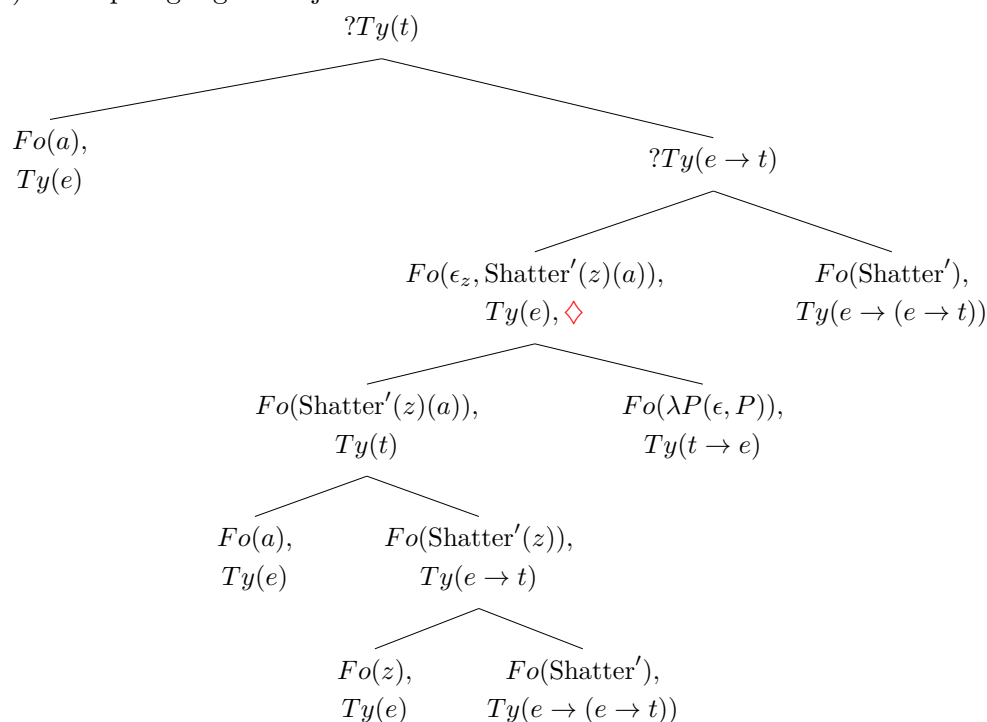


where $a = \epsilon_y, \text{Shatter}'(\epsilon_x, \text{Stones}'(x))(y)$

The epsilon term can now be compiled as normal, providing a Formula value for the logical object node of the propositional tree (8.46). This value is what would be expected from an antipassive: $\epsilon_z, \text{Shatter}'(z)(a)$, some arbitrary individual that is shattered by a , a being some arbitrary stone-shatterer.

¹⁰The details of the epsilon structure of the logical subject are suppressed for clarity of presentation.

(8.46) Compiling logical object



where $a = \epsilon_y, Shatter'(\epsilon_x, Stones'(x))(y)$

The propositional tree can now be evaluated, leading to the root node being decorated with the propositional formula in (8.47). This represents a proposition that *a* shattered *b* where *a* is some arbitrary shatterer of stones and *b* is some arbitrary thing shattered by *a*.

$$\begin{array}{l}
 (8.47) \quad Shatter'(b)(a) \\
 \text{where } a = \epsilon_y, Shatter'(\epsilon_x, Stones'(x))(y) \\
 \quad \quad b = \epsilon_z, Shatter'(z)(a)
 \end{array}$$

(8.47) represents a proposition that *a* shattered *b* where *a* is any arbitrary stone shatterer and *b* is any arbitrary shatteree. In other words, this represents an event of shattering where neither the agent nor the patient are specified. This is exactly what might be expected from a verb carrying both antipassive and unaccusative morphology, but it does not appear to capture the fact that it was stones which shattered in the situation being described. In fact, this is only an apparent problem. Epsilon terms carry inherent existential force, meaning that the situation described in (8.47) involves not only a shatterer and a shatteree, but also stones. This is most clearly seen when the formula in (8.47) is translated into a formula of standard predicate logic. Algorithmic

rules for this conversion ('Q-Evaluation Rules') are defined in Kempson *et al.* (2001:241-243). Applying them to (8.47) results in (8.48).

$$(8.48) \quad \exists x \exists y \exists z [Stones'(x) \wedge Shatter'(x)(y) \wedge Shatter'(z)(y) \wedge Shatter'(z)(y)]$$

The proposition in (8.48) is true just in case there are stones which shattered, while the agent of the shattering is unspecified. From a truth conditional point of view, this interpretation is exactly the same as the interpretation of the unaccusative. Given the similarities between the middle voice and the unaccusative noted in table 8.1 and in section 7.2.4, this is a welcome result. It is notable that the treating the verb as having both an unaccusative and an antipassive morpheme still results in an unaccusative interpretation. As may be clear from the derivation just outlined, this is because the unaccusative suffix precedes the antipassive and is processed first. It is therefore the unaccusative which determines the tree position of the term projected by the sentential subject (step (8.43) above). The incremental nature of the parsing process is therefore crucial in providing the correct interpretation.¹¹

The Dynamic Syntax construal of terms as having internal complexity is also key to this explanation. The unaccusative suffix expresses the external argument of the predicate (*some arbitrary shatterer*), while the antipassive suffix expresses the internal argument of the predicate (*some arbitrary shatteree*). If the terms projected by these morphemes did not have internal structure, there would be no room for a lexical argument in addition (i.e. the syntactic subject *stones*). But because terms are construed as epsilon terms, it is possible for the term $\epsilon_x, Stones'(x)$ to be incorporated into the term projected by the unaccusative morpheme, and ultimately to surface in the final propositional formula as $\exists x [Stones'(x)]$. The internal structure of arguments essentially allows the three argument-projecting morphemes to instantiate two argument roles, and to do so quite naturally.

The truth conditional interpretation of (8.48) is entirely expressed by the first two conjuncts. The third and fourth conjuncts are superfluous from a semantic point of view. But as noted above, Stevenson (1941:112) claims that the antipassive suffixes 'sometimes intensify the meaning of the parent verb.' Stevenson's presentation of the data on this matter is somewhat opaque and not entirely convincing. Nevertheless, it is notable that adding the antipassive suffix to an unaccusative verb causes the final

¹¹In section 7.2.5 it was noted that for some verbs, the unaccusative suffix appears to attach to the antipassive, rather than to the transitive verb stem (7.22b). This causes a problem for the current analysis. Parsing the two morphemes in order would result in the inverse of the analysis just described for middle voice; such verbs would be expected to have an antipassive interpretation. In fact, their interpretation is unaccusative with the apparent antipassive morpheme seeming to make no semantic contribution. It is not clear how these data might be integrated into the analysis as it currently stands, other than it was noted in section 7.2.5 that there is some evidence that verbs with the antipassive are (or may be becoming) more lexicalised than other VE forms. It may be that some of these 'antipassive' verbs are better treated as genuinely intransitive verbs.

formula to contain ‘extra’ expressions of the predicate. Perhaps it is possible that the repetition of the action in (8.48) expresses intensivity: *There are stones and the stones are shattered and there is shattering and there is shattering*. This is largely speculation, but if it were correct it would constitute a remarkable explanation of the correlation between the valency changing function of the middle voice and Stevenson’s claims that *-VnV* may encode intensive action, an explanation that falls out naturally from the interaction between the two detransitivizing suffixes.

8.6 Conclusion

This chapter has outlined an analysis of valency-reducing verb extensions in Katcha, making use of the Dynamic Syntax construal of terms as expressions of the epsilon calculus. The inherent internal structure of epsilon terms allows a straightforward way to incorporate context dependence into the account. An epsilon term represents an arbitrary witness of some predicate and we can straightforwardly define this predicate as being dependent on the immediate context. Thus it is straightforward to define structures such as ‘Kuku is laughing (at whatever it is that Kuku is laughing at in this instance)’ or ‘Drums are beaten (by whatever it is that beats drums)’.

In terms of the Katcha data, the approach outlined here allows us to neatly capture the difference between (for example) an antipassive verb and a transitive verb with no overt object. A transitive verb decorates its logical object node with a metavariable: a term whose content is underspecified and requires subsequent update. In the case of a transitive verb without an overt object, this update will come from context. In the case of the antipassive, the update comes from the suffix, which supplies a contextually defined epsilon term. The same is true for the other suffixes which reduce semantic valency, unaccusative and middle voice. Although the denotational content of the epsilon term is minimal, it decorates the object node and so prevents it from being instantiated from context by something with more substantive content. Thus ‘Kuku is laughing’ is semantically different to ‘Kuku is laughing at something’, despite the same inherently transitive verb and an equally indeterminate ‘object’ being used in both cases.¹²

The semantic difference between a transitive verb with an unspecified object and a verb of reduced valency is not restricted to Katcha, nor to languages with morphological antipassives. Fodor and Fodor (1980) note in regard to scope effects that the same is

¹²The analysis as it currently stands has antipassives denoting some arbitrary patient, while the pro-dropped object of a transitive verb must have a referential interpretation. It may be that this is too strong. Intuitively, one might expect a transitive verb with no object to have the interpretation I have ascribed to antipassives (there is some patient but we do not know or care what it is), and for antipassives to be genuinely intransitive. Determining whether this is the case will require further empirical study on the referentiality of pro-dropped arguments.

true for detransitivized verbs in English; there are important semantic distinctions to be made between between ‘Everyone was reading’ and ‘Everyone was reading something’. Steedman (2011, 2015) provides an analysis of such detransitivized English sentences in which he construes the implied objects as Skolem terms. There are clear parallels between Steedman’s analysis and the one given here insofar as both construe a ‘missing’ argument as being represented by an arbitrary semantic object with properties dependent on context. The Dynamic Syntax use of epsilon terms though is arguably more transparent in that an epsilon term specifies its properties within the proposition that forms its restrictor. As shown above, it is quite straightforward to define lexical actions which specify the properties of the restrictor and thereby use this formalism to model highly context-dependent semantic objects.

Chapter 9

Adjuncts, Prepositions and Case

Introduction

The purpose of this chapter is to outline a Dynamic Syntax approach to prepositional phrases. To date, the only serious attempt at analysing prepositional phrases within Dynamic Syntax is that of Marten (2002), who treats them as optional arguments of the main predicate. This chapter proposes an alternative which construes prepositional phrases as adjuncts, an approach which more closely reflects the observations of Lakoff and Ross (1976) that most prepositional phrases are adverbial and situated outside the verb phrase. A prepositional phrase constructs semantic structure which is separate from the main propositional tree but connected to the node it modifies by means of a LINK relation. The analysis is developed by applying it not only to prepositional phrases, but also to other relevant constructions in the Katcha data.

Section 9.1 demonstrates how this approach applies to prepositional phrases which have an intersective, or adjectival, interpretation. These are prepositional phrases which modify a term. This term may be an individual but is more commonly an event (again, this is in line with the observations of Lakoff and Ross (1976)). The prepositional phrases are construed as building a LINKed propositional tree that provides extra information about some argument in the matrix proposition. As such they are similar to relative clauses, and use the same technical apparatus as standard DS treatments of relatives. The formal details of the process are refined slightly in section 9.2 in order to handle the recursive locative prepositional phrases described in section 6.4. This refinement makes use only of DS tools that have been proposed independently for other constructions in other languages.

Given that the approach adopted here is to treat prepositional phrases as adjuncts, it should apply equally as well to adverbs. This is taken up in section 9.3, with a discussion of prepositional phrases which modify predicates and which therefore have a subsective, or adverbial, interpretation. They are construed as building a LINKed tree providing

extra information about some predicate in the matrix proposition. Section 9.4 then extends this to locative adverbs. These words have been described by some authors as postpositions, but it was argued in section 6.4 that they are in fact adverbs. Locative adverbs are easily dealt with under an analysis that construes them as modifying a predicate projected by the locative preposition, thus bringing together the analyses of the two types of modification.

The final two sections of the chapter apply the analysis to two constructions related to prepositional phrases. Section 9.5 discusses applicatives, arguing that these may be treated much like prepositions, the only real difference being that the applicative morpheme does not form a syntactic constituent with its complement. Section 9.6 then goes on to look at case. The DS construal of case as a filter on well-formed structure is discussed with respect to the analysis of prepositional phrases developed here and it is suggested that this may shed light on indirect and applied objects, topicalised subjects and the form of personal pronouns in Katcha.

9.1 Event-modifying prepositional phrases

- (9.1) a:fú úróné:né k-ete k-ɔ:na
 ants 3M.crawl LOC-1SG LOC-body
 ‘ants are crawling on my body’

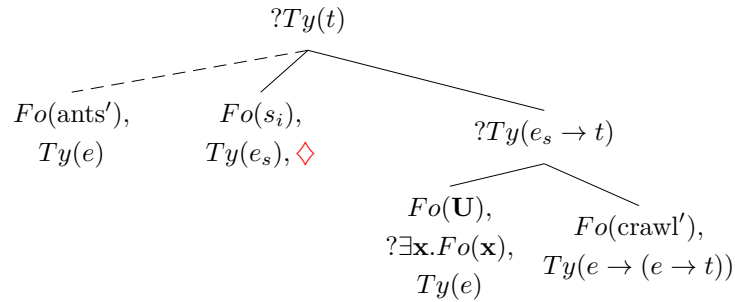
In a sentence like (9.1), it is not necessarily obvious whether the locative phrase *kete kɔ:na* describes the location of the ants or the location of the event of their crawling. In other words, this phrase might be thought of as modifying an individual or it might be thought of as modifying an event. From a formal point of view, this distinction does not matter a great deal since both individuals and events project type *e* terms. A phrase such as *on my body* can be thought of as supplying an additional proposition which is ‘intersective’ in that it shares an argument with the matrix proposition. Whether the shared argument is an event term or an individual term does not make much difference to the process of building the propositional tree.

In Dynamic Syntax, the formal tool used for modelling the connection between propositions is the LINK relation. A LINK is the relation that holds between two semantic trees which share some content. It is generally interpreted as a conjunction of the values of the LINKed nodes. In the case of event-modifying prepositional phrases, the LINK will hold between the situation argument of the matrix tree and the root node of a LINKed tree that expresses an additional proposition about that situation. This formal apparatus, a proposition LINKed to a term, is standardly used in DS to model relative clauses. This is hardly surprising, given that a relative clause also represents an additional proposition about some argument of the matrix proposition. A PP adjunct modifying an argument is essentially a ‘small’ relative clause. To see how

this might work, we can consider the process of parsing the sentence in (9.1), assuming an interpretation where the prepositional phrase modifies the event (though as noted above, the implementation works in much the same way for an analysis in which the PP modifies the subject argument).

The processing of (9.1) begins with the parsing of the sentential subject and verb, the lexical actions of the verb leaving the pointer on the situation argument node as in (9.2).^{1,2}

(9.2) Parsing *a:fu urune:ne*

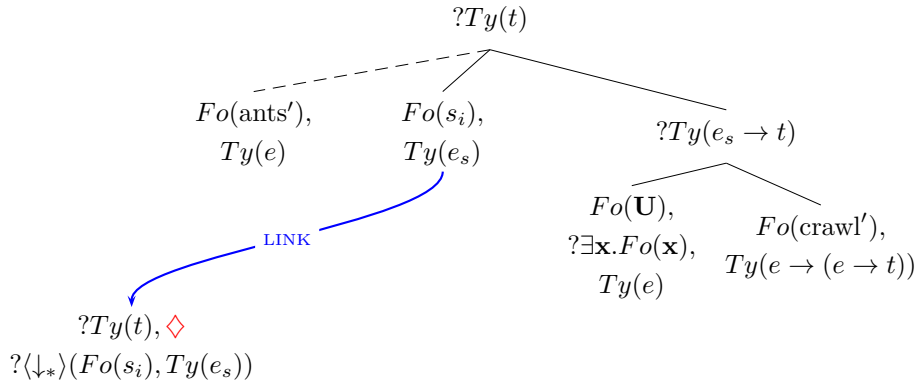


The string *a:fu urune:ne* forms a fully grammatical sentence; if there were no additional lexical material, the pointer would move to the logical subject node to resolve the metavariable by UNIFICATION with the unfixed node and the tree could compile to give a fully specified proposition. But with the pointer at the event argument node, there is nothing to stop this node being developed further. This can be done using the computational action of LINK INTRODUCTION (Kempson *et al.* 2001:113; Cann *et al.* 2005:88). This rule constructs a LINK relation from a type e node to an open propositional node (a node with a requirement for type t). It also adds a modal requirement $?(\downarrow_*)(Fo(s_i), Ty(e_s))$, which requires that somewhere below (i.e. in the LINKed tree) should be a copy of the node at the head of the LINK (9.3).

¹The assumption that the lexical actions of the verb leave the pointer on the situation argument node is an adjustment to the account given in chapter 8 where it was assumed that the lexical actions of the verb left the pointer on the logical subject node. This does not affect the analyses given there, merely adding an additional step of pointer movement from the situation argument node to the logical subject node.

²Cann (In prep.) argues that, like other type e terms, event arguments should be construed as epsilon terms. In the formulae given in this section the internal structure of terms, including event variables, is suppressed for notational clarity. The interpretation of PP adjuncts given here is a non-restrictive one and so does not need to make reference to the internal structure of the epsilon-term.

(9.3) Applying LINK INTRODUCTION

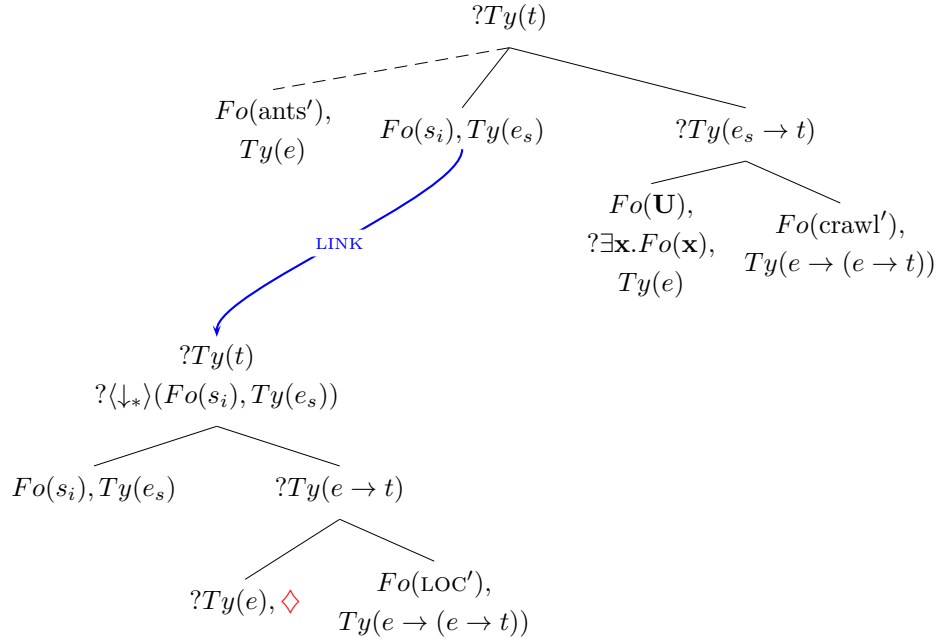


The preposition can be construed as providing the predicate for the LINKed proposition, that is, the preposition defines a relationship (in this case locative) between its complement and the event it modifies. The lexical entry for locative *ka* is given in (9.4). It checks that the pointer is at an open LINKed propositional node, that is, a node which requires type t and is connected by a LINK to a completed type e node. The actions then construct a predicate-argument structure, decorating the predicate node with a two place locative relation (LOC'), decorating the external argument node with a copy of the node at the head of the LINK (in this case, the situation variable s_i), and leaving the pointer on the open internal argument node. Executing these actions leads to the partial tree in (9.5).

(9.4) Lexical entry for locative *ka*

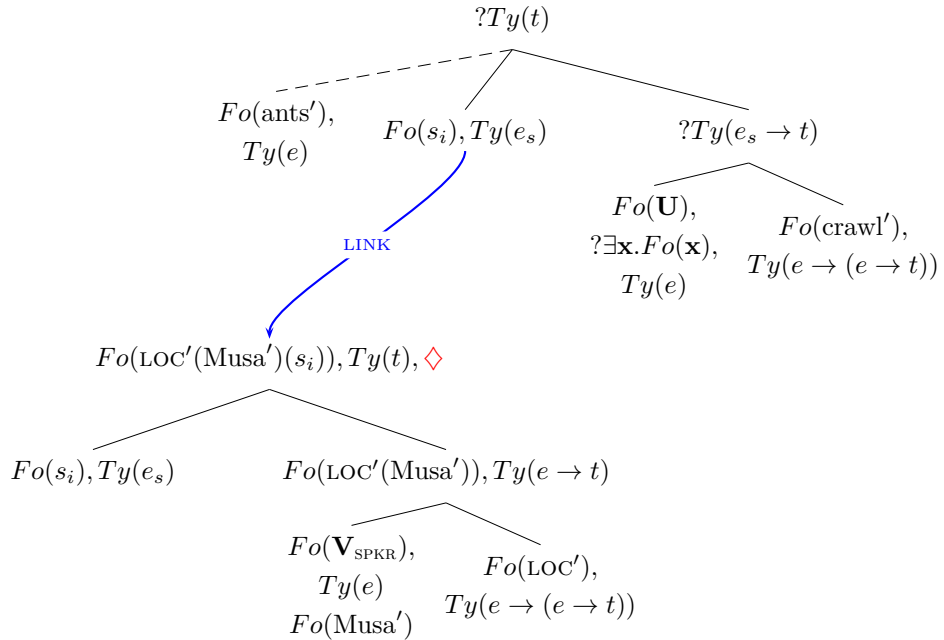
IF	$?Ty(t), \langle L^{-1} \rangle(Fo(\alpha), Ty(e))$
THEN	$make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(Fo(\alpha), Ty(e))$ $go(\langle \uparrow_0 \rangle), make(\langle \downarrow_1 \rangle), put(?Ty(e \rightarrow t))$
ka	$make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle),$ $put(Fo(LOC'), Ty(e \rightarrow (e \rightarrow t)))$ $go(\langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(?Ty(e))$
ELSE	Abort

(9.5) Parsing *a:fu urone:ne ka*



The complement of the preposition can then be parsed. In the case of (9.1), the complement is a first person pronoun. This projects a metavariable which is restricted to refer to the speaker of the utterance. Once the referent is identified from context (*Musa'*), the argument is resolved and the LINKed sub-tree can be compiled as in (9.6).

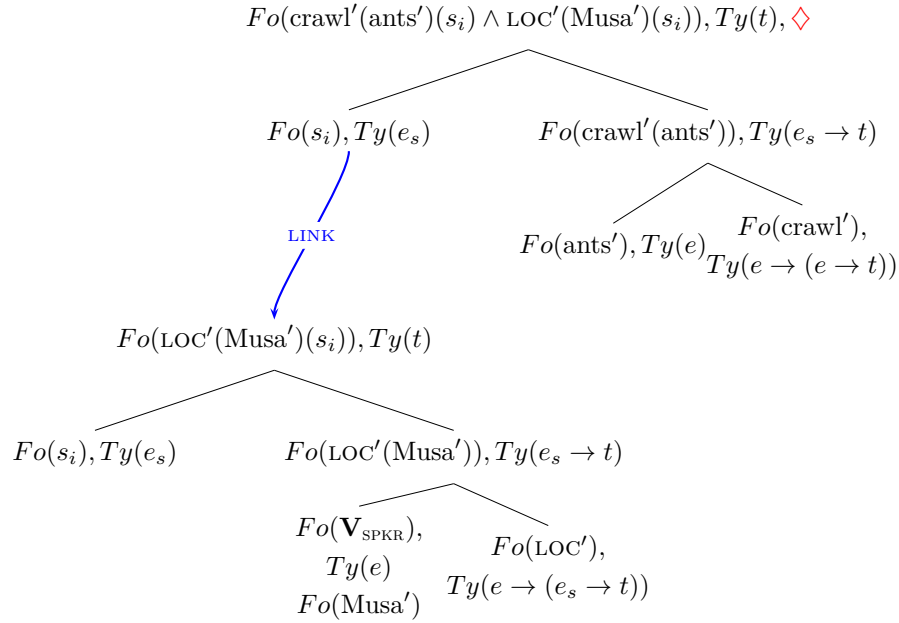
(9.6) Compiling LINKed sub-tree (prepositional phrase)



It is worth making a couple of points about the subordinate tree which is associated with the prepositional phrase in (9.4). Firstly, prepositional phrases are phrases and not clauses; they are not tensed and do not have truth values and so cannot constitute well-formed propositions on their own. This is reflected in the fact that the lexical actions associated with the prepositional phrase can only be processed in the context of a LINK transition from a superordinate semantic tree. Nonetheless, the LINKed tree is an expression of type t , a proposition, in that it expresses a relation between two terms, and in the case of (9.4) one of them is an event argument. A prepositional phrase thus constitutes a kind of dependent proposition. Secondly, the lexical actions associated with the preposition do not supply an event argument. Instead, they *ka* copy the formula value from the head of the LINK transition to the logical subject node of the subordinate tree. In (9.4), this shared term happens to be an event.³

Up to this point, the parser has processed *a:fu urune:ne kete*. This is a grammatical sentence, ‘ants are crawling on me’, which is reflected in the fact that the semantic structure so far constructed is made up of two well formed propositional structures (one a LINKed sub-tree of the other). If there were no more lexical material to be parsed in (9.1), the pointer would return to the matrix tree, the metavariable **U** on the matrix logical subject node would be unified with the unfixed node and a step of LINK-EVALUATION would apply leading to the final tree in (9.7) which represents the conjoined proposition that ants crawl in event s_i and that the location of this event is Musa.

³As it stands, there is nothing in the lexical entry (9.4) to prevent the locative phrase modifying an individual, should the interpretation be that the *ants are on me*, rather than the *ants’ crawling is on me*. In this case the shared term would be an individual and not an event. This would have the effect of making the LINKed proposition non-finite, but given that a preposition cannot project a matrix clause, this should cause no problem.

(9.7) Final tree for *a:fu urune:ne kete*

9.2 Recursive locative prepositional phrases

The tree given in (9.7) represents the logical form of the sentence *a:fu urune:ne kete*, ‘ants are crawling on me’. But the sentence in (9.1) specifies the location of the event further, ‘ants are crawling on my body’. Katcha expresses this by means of a second locative phrase following the first. A parallel construction is found in English (*the assailant punched me on the nose*) though in English this only occurs following direct objects and not with prepositional phrases (**the assailant landed a punch on me on the nose*).

Modelling the recursive construction found in Katcha is in principle quite straightforward; it is simply a case of moving the pointer to the event argument of the LINKed tree and applying LINK INTRODUCTION again to construct another sub-tree. The act of moving the pointer, though, requires some motivation. As the analysis currently stands, the lexical actions of locative *ka* construct a fully decorated external argument node and there is therefore no reason for the pointer to return to this node once it has been built, which prevents its further development. There are two alternative approaches to overcoming this apparent problem. The first is a lexical approach. In section 6.4.2 it was noted that when the pronoun occurs before a body-part locative phrase its tone melody appears to differ from the usual pronominal tone pattern. Further research would need to be conducted on the tone system of Katcha before making categorical assertions, but if this tone change proves to be consistent, it is certainly possible that it signals the fact that the locative relation is to be further specified. Thus a first person pronoun with the usual tone melody (H-H after locative

ka) would have the lexical entry shown in (9.8a), which decorates a term-requiring node with a metavariable in the normal way. A first person pronoun with the alternative tone pattern (L-L) would have the lexical entry shown in (9.8b). As well as decorating the internal argument node with a metavariable, these actions move the pointer to the external argument node (which is an event variable) and decorate it with a requirement for a LINK relation to a further proposition.

- (9.8) a. Lexical entry for *été*
- | | | |
|------------|------|--|
| <i>été</i> | IF | $?Ty(e)$ |
| | THEN | $put(Fo(\mathbf{U}_{SPKR}), Ty(e), ?\exists \mathbf{x}. Fo(\mathbf{x}))$ |
| | ELSE | Abort |
- b. Lexical entry for *ete*
- | | | |
|------------|------|---|
| <i>ete</i> | IF | $?Ty(e)$ |
| | THEN | $put(Fo(\mathbf{U}_{SPKR}), Ty(e), ?\exists \mathbf{x}. Fo(\mathbf{x}))$
$go(\langle \uparrow_0 \rangle \langle \uparrow_1 \rangle \langle \downarrow_0 \rangle), put(? \langle L \rangle ?Ty(t))$ |
| | ELSE | Abort |

Another step of LINK INTRODUCTION can now apply in the usual way and the parse of the next locative phrase can continue as in the same way as the first. The function of the extra requirement on the event node is to force this otherwise optional action to take place. The alternative tone pattern signals that the proposition is not complete after the pronoun has been parsed and that it requires further specification.

The second approach to overcoming the apparent problem of pointer movement within the LINKed locative proposition, one that does not rely on tonal information, is a computational one. This involves making an adjustment to the lexical entry for the preposition such that it decorates its external argument node with a requirement rather than formula value (9.10) and a concomitant adjustment to the LINK INTRODUCTION rule such that it copies the formula from the head of the LINK to the new sub-tree as an annotation on an unfixed node, rather than as a requirement (9.9). This version of LINK INTRODUCTION, referred to as LINK-COPY INTRODUCTION in Kempson *et al.* (2001:117), is exactly what is used for bare relative clauses in English (eg *the man Sue likes*). In making this move we are altering the roles of the lexical entry and the computational action slightly. Rather than the computational rule introducing a requirement and the lexical entry introducing a decorated node, the lexical entry introduces a requirement and the computational rule introduces an (unfixed) decorated node.

(9.9) LINK-COPY INTRODUCTION (Kempson *et al.* 2001:117)

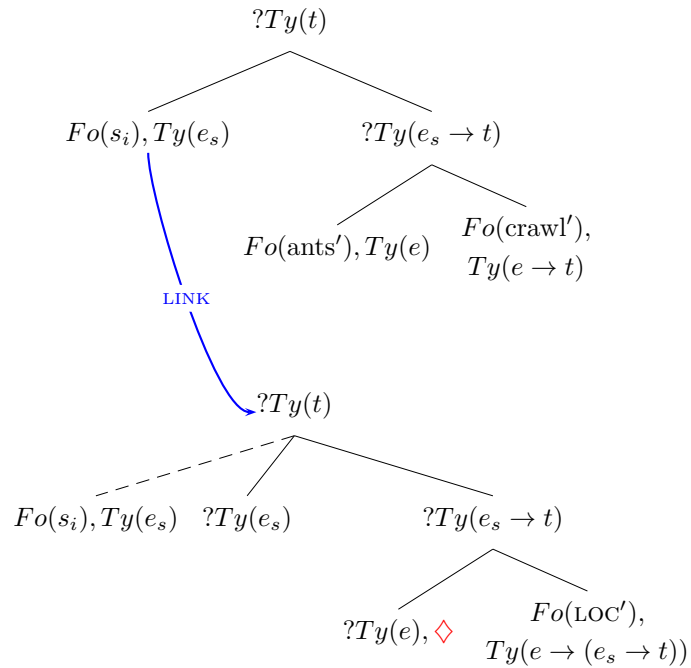
$$\frac{\{\dots\{X, Fo(\alpha), Ty(e), \diamond\}\dots\}}{\{\dots\{X, Fo(\alpha), Ty(e)\}\}, \{\langle L^{-1} \rangle X, ?Ty(t), \diamond\}, \{\langle \uparrow_* \rangle \langle L^{-1} \rangle X, Fo(\alpha), Ty(e)\}\dots\}}$$

(9.10) Lexical entry for locative *ka* (revised)

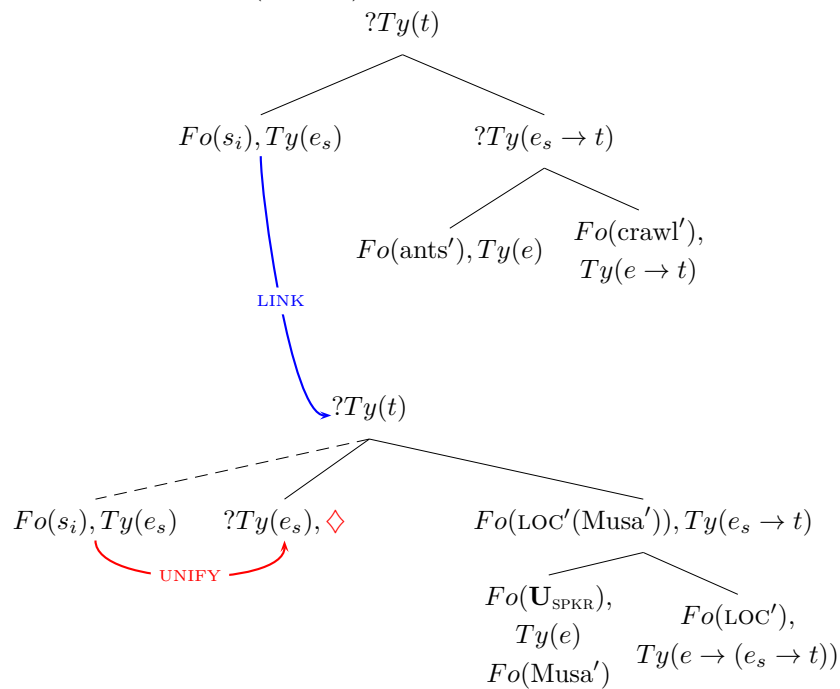
ka	IF	$?Ty(t), \langle L^{-1} \rangle Ty(e_s)$
	THEN	make($\langle \downarrow_0 \rangle$), go($\langle \downarrow_0 \rangle$), put($?Ty(e_s)$)
		go($\langle \uparrow_0 \rangle$), make($\langle \downarrow_1 \rangle$), put($?Ty(e_s \rightarrow t)$)
		make($\langle \downarrow_1 \rangle$), go($\langle \downarrow_1 \rangle$),
		put($Fo(LOC')$, $Ty(e \rightarrow (e_s \rightarrow t))$)
		go($\langle \uparrow_1 \rangle$), make($\langle \downarrow_0 \rangle$), go($\langle \downarrow_0 \rangle$), put($?Ty(e)$)
	ELSE	Abort

Applying these revised computational and lexical actions to (9.2) leads to the partial tree in (9.11).

(9.11) Parsing *a:fu urune:ne ka* (revised)

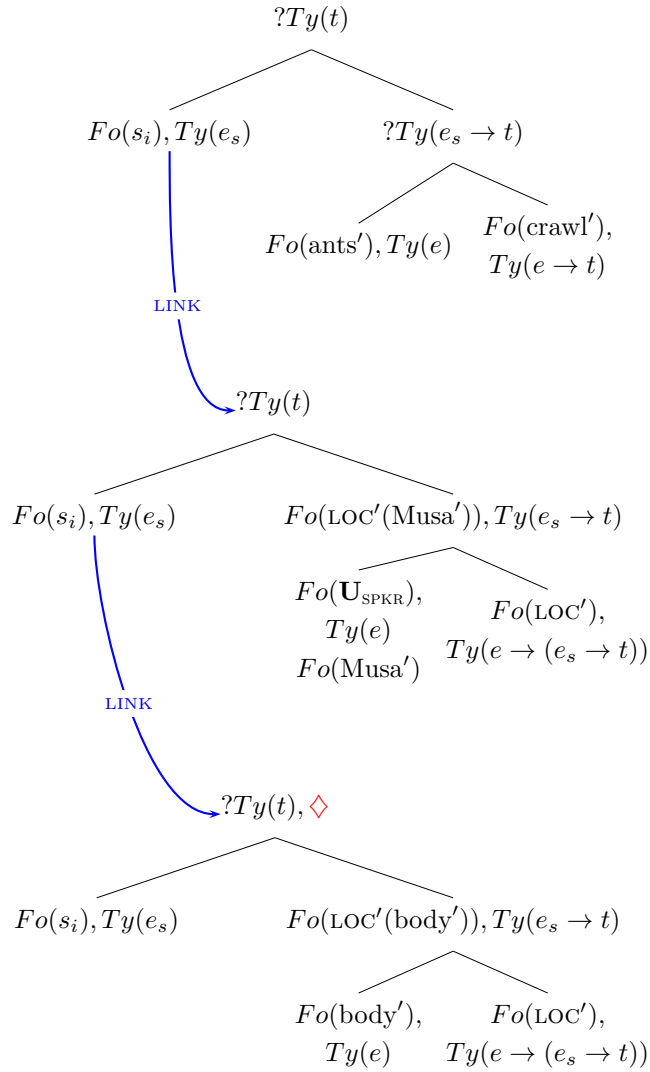


After parsing the personal pronoun, which duly decorates the open internal argument node, the pointer moves to the external argument node to resolve the open type requirement there. This is done by UNIFYING the current node with the unfixed node (9.12).

(9.12) Parsing *a:fu urune:ne kete* (revised)

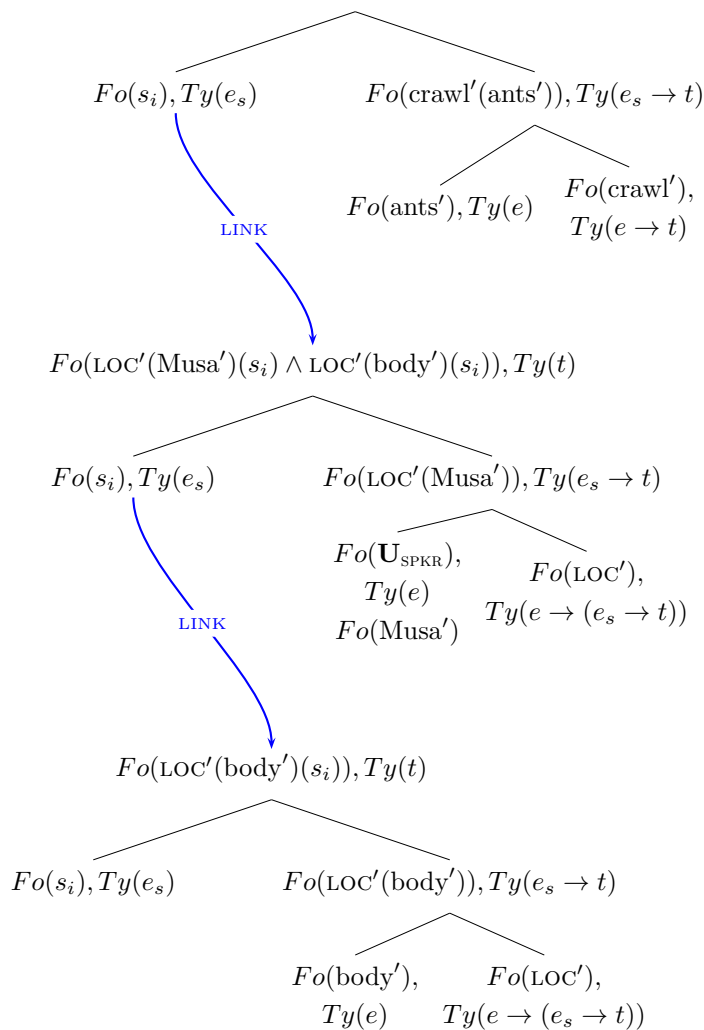
At this point the tree could of course be compiled, as in (9.7). But with the pointer sitting on the sub-tree's event argument node, it is now possible to develop this node further by repeating the step of LINK-COPY INTRODUCTION and parsing the remaining lexical material (9.13).

(9.13) Parsing *a:fu urune:ne kete kɔ:na*



The final step is to evaluate the tree. Successive steps of LINK EVALUATION lead to the root node of each tree being decorated by a conjoint formula expressing the propositional content of that tree and all its sub-trees (9.14). The formula on the matrix root node represents the conjoined proposition that ants crawl in event s_i and that the location of this event is Musa and that the location of this event is a body.

(9.14) Final tree for *a:fu urune:ne kete kɔ:na*

$$Fo(\text{crawl}'(\text{ants}')(\text{s}_i) \wedge \text{LOC}'(\text{Musa}')(\text{s}_i) \wedge \text{LOC}'(\text{body}')(\text{s}_i)), Ty(t)$$


There are two observations to be made regarding the treatment of recursive locative phrases outlined here. The first is that there is nothing to specify possession in the implementation, which reflects the fact that there are no morphemes indicating possession in the Katcha construction (or indeed, in the parallel English construction *punched me on the nose*). Nonetheless, a possessive interpretation is ensured by the fact that the propositions projected by the two prepositional phrases are construed as conjuncts which share an argument. In other words, they express properties of the same event; the event of ants crawling on Musa is identified with the event of ants crawling on a body. So for the overall proposition to be semantically and pragmatically coherent, the body must be Musa's.

The second observation is that in using the rule of LINK-COPY INTRODUCTION to initiate the construction of sub-trees, some of the burden for introducing semantic

content into the LINKed tree is moved from the lexicon to the computational system. This is not a move to be made lightly because Dynamic Syntax takes an explicitly lexicalist view of grammar: computational actions are in principle general, optional and universally available across languages; it is to be expected that any idiosyncratic features of a language will be found in the lexicon. For this reason, the LINK-COPY INTRODUCTION rule for English, which is described as ‘language-idiosyncratic’ by Kempson *et al.* (2001:117), is abandoned in Cann *et al.* (2005:114) and replaced with a lexical entry for a phonologically null relative complementizer. This is not an ideal solution either because Dynamic Syntax does not generally invoke silent morphemes or empty categories; any actions that cannot be ascribed to the lexical entry of a particular morpheme (or type of morpheme) would be expected to reside in the computational system. English bare relatives therefore pose something of a challenge to DS. They are relatively easy to account for, either by computational rule or by lexical entry, but both solutions are somewhat stipulative.

In this context, the fact that Katcha prepositional phrases can be analysed as making use of the same rule as English bare relatives suggests that perhaps this rule is not as idiosyncratic as previously thought. It certainly lends plausibility to the suggestion that the computational system may be the right place to put this kind of anaphoric, term-expanding action after all. If computational rules are genuinely optional, the possibility must be left open that there may be some rules which are used only rarely. It is true that a rule found to be used in only one language would be suspicious, but rather than being limited to English bare relatives, the LINK-COPY action is also required for recursive prepositional phrases in Katcha - thus it has been independently motivated for two different constructions in two different languages.

9.3 Predicate-modifying prepositional phrases

- (9.15) akká mǒ m-ɔni é:má a kúbbú tí-já
 woman PROX.F 3F-make things INSTR spoon NON.CORE-PROX.3M
 ‘The woman is making food using this spoon’

In a sentence like (9.15), it seems intuitive that the adverbial prepositional phrase *a kúbbú tíjá* modifies the predicate rather than the entire event. As an adverbial modifier a phrase such as *using a spoon* can be thought of as a function from a predicate which might be informally represented as *make_food'(x)* to a subsumed predicate of the same type (such as *spoon-make_food'(x)*). The modifier is therefore of type $(e \rightarrow t) \rightarrow (e \rightarrow t)$. The preposition itself would project a semantic object which predicates over terms to give such a modifier and is therefore of type $e \rightarrow ((e \rightarrow t) \rightarrow (e \rightarrow t))$.

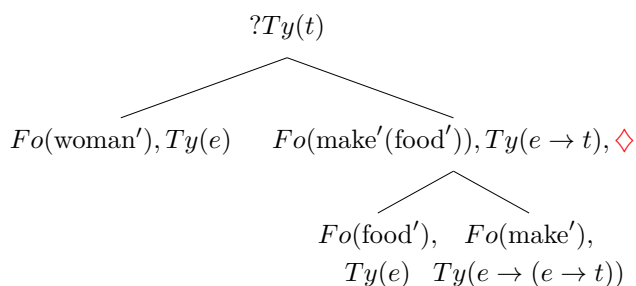
In Dynamic Syntax the process which is best suited to modelling type-maintaining modification is LINK APPPOSITION. Cann *et al.* (2005:363) define this process for type e nodes, but it can be made to apply more generally by defining it type-neutrally. In this way a rule defined for nominal apposition can also be used for adverbial modification.⁴ The LINK APPPOSITION rule simply builds a LINK relation from a node of any type to a node with a requirement for that same type (9.16).

(9.16) LINK APPPOSITION (type neutral)

$$\frac{\{\dots \{Tn(a), Ty(\alpha), \dots, \diamond\} \dots\}}{\{\dots \{Tn(a), Ty(\alpha), \dots\} \dots\}, \{(L^{-1})Tn(a), ?Ty(\alpha), \diamond\}}$$

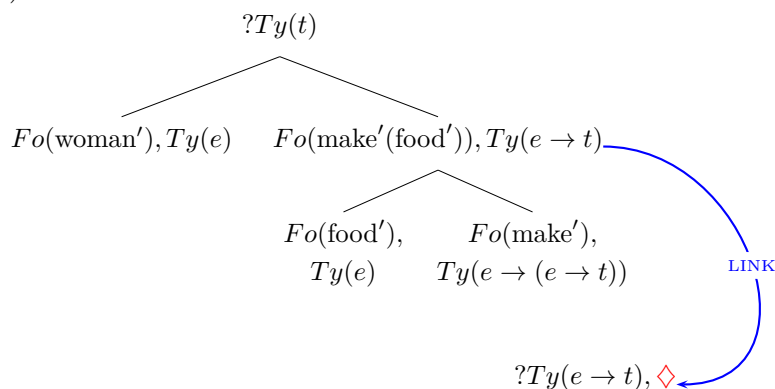
To see how this might work, we can consider the process of parsing the sentence in (9.15), ignoring the demonstratives for ease of exposition. After parsing the subject, verb and object, but before evaluating, the partial tree in (9.17) has been constructed:⁵

(9.17)



With the pointer at a type-complete node, LINK Apposition may apply, constructing a LINKed node requiring the same type (9.18).

(9.18)



⁴In chapter 10 LINK APPPOSITION is also used to analyse nominal modifiers in Katcha.

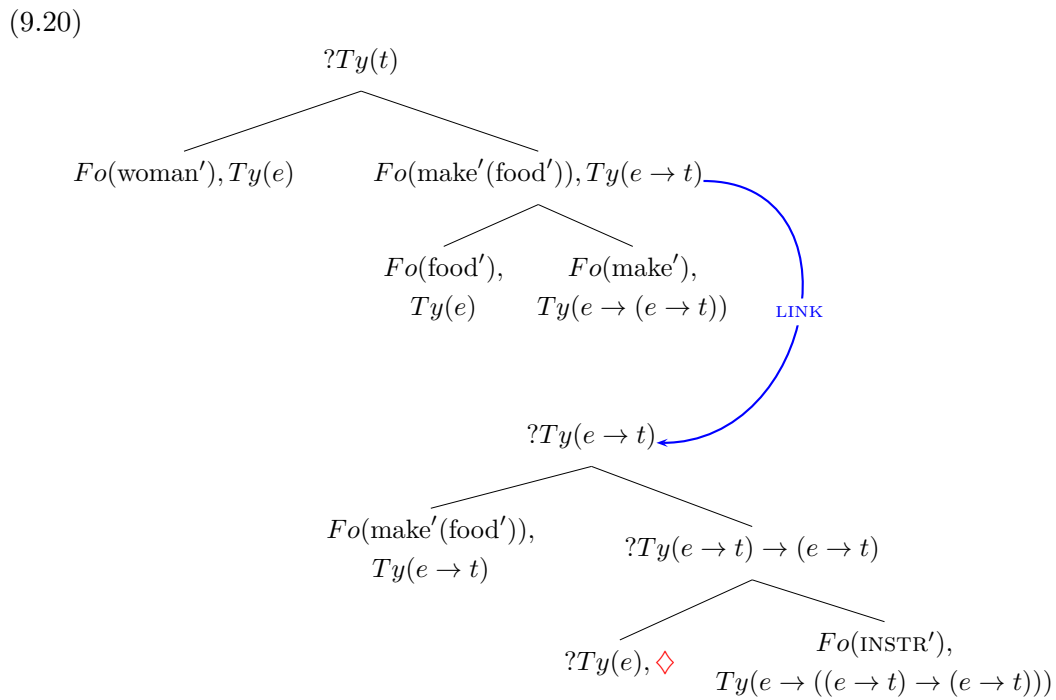
⁵The situation argument, epsilon terms, and gender agreement are suppressed for clarity.

At this point the instrumental preposition is parsed. This is construed as a relation between the preposition's complement (which is a term) and the predicate it modifies, yielding a $Ty(e \rightarrow t)$ predicate. The trigger condition checks that there is a type complete predicate to be modified at the head of the LINK relation, and the actions then copy its formula value to the appropriate argument of the modifier.

(9.19)

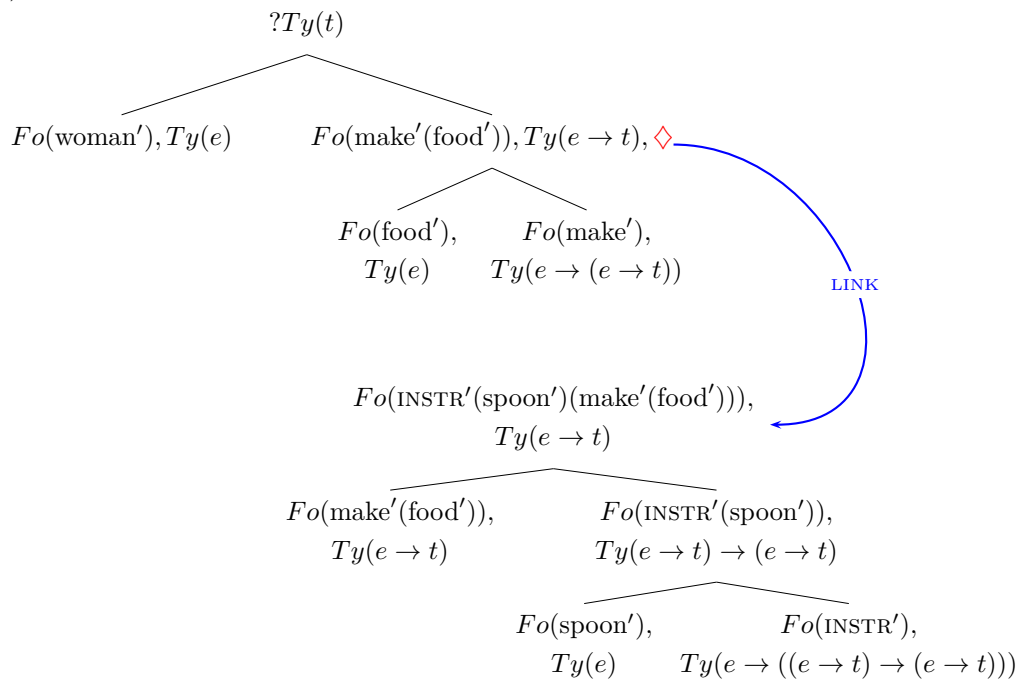
ana	<table border="0"> <tr> <td style="padding-right: 10px;">IF</td> <td>$?Ty(e \rightarrow t), \langle L^{-1} \rangle Fo(\alpha), Ty(e \rightarrow t)$</td> </tr> <tr> <td style="padding-right: 10px;">THEN</td> <td> $make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(Fo(\alpha), Ty(e \rightarrow t))$ $go(\langle \uparrow_0 \rangle), make(\langle \downarrow_1 \rangle), put(?Ty(e \rightarrow t) \rightarrow (e \rightarrow t))$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle),$ $put(Fo(INSTR'), Ty(e \rightarrow ((e \rightarrow t) \rightarrow (e \rightarrow t))))$ $go(\langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(?Ty(e))$ </td> </tr> <tr> <td style="padding-right: 10px;">ELSE</td> <td>Abort</td> </tr> </table>	IF	$?Ty(e \rightarrow t), \langle L^{-1} \rangle Fo(\alpha), Ty(e \rightarrow t)$	THEN	$make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(Fo(\alpha), Ty(e \rightarrow t))$ $go(\langle \uparrow_0 \rangle), make(\langle \downarrow_1 \rangle), put(?Ty(e \rightarrow t) \rightarrow (e \rightarrow t))$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle),$ $put(Fo(INSTR'), Ty(e \rightarrow ((e \rightarrow t) \rightarrow (e \rightarrow t))))$ $go(\langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(?Ty(e))$	ELSE	Abort
IF	$?Ty(e \rightarrow t), \langle L^{-1} \rangle Fo(\alpha), Ty(e \rightarrow t)$						
THEN	$make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(Fo(\alpha), Ty(e \rightarrow t))$ $go(\langle \uparrow_0 \rangle), make(\langle \downarrow_1 \rangle), put(?Ty(e \rightarrow t) \rightarrow (e \rightarrow t))$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle),$ $put(Fo(INSTR'), Ty(e \rightarrow ((e \rightarrow t) \rightarrow (e \rightarrow t))))$ $go(\langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(?Ty(e))$						
ELSE	Abort						

Following the actions in (9.19) builds the tree in (9.20).



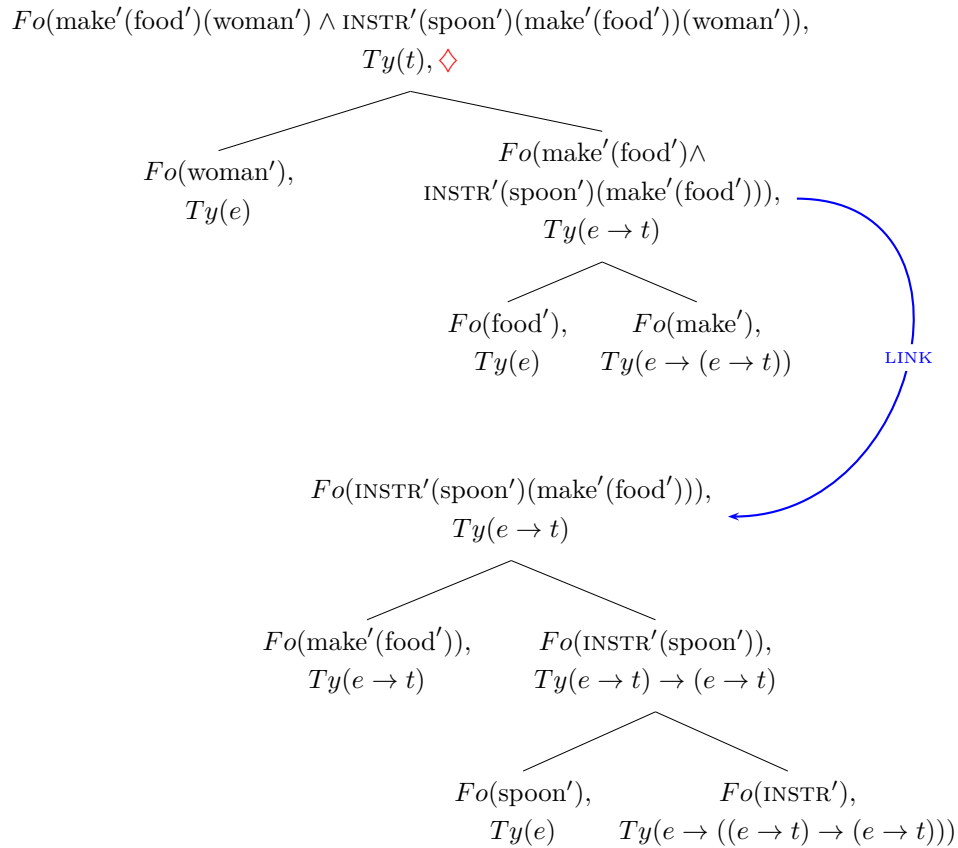
Parsing the complement of the preposition and completing the LINKed tree decorates the root node of the LINKed tree with the formula value $INSTR'(spoon')(make'(food'))$. This complex predicate represents the concept informally described above as *spoon-make_food'* and the partial tree as developed to this point is given in (9.21).

(9.21)



With the modifying sub-tree now fully specified, a value can be given to the predicate as a whole. This requires a process of LINK-Evaluation, which can in fact be defined quite simply. All versions of LINK-Evaluation carry out the same basic function, copying the content of a LINK structure onto a node in the matrix tree and coordinating the formula values, typically by conjunction (Cann *et al.* 2005:312 fn). In the case of predicate-to-predicate LINK Apposition, this will result in a conjoined matrix predicate: $\text{make}'(\text{food}') \wedge \text{INSTR}'(\text{spoon}')(\text{make}'(\text{food}'))$. This conjoined predicate can then apply to the logical subject yielding the tree in (9.22) with the interpretation for the sentence as a whole that a woman both made food and that she made it with a spoon.

(9.22)



It is to be expected that this analysis of adverbial PPs will be equally applicable to adverbs themselves. This is the topic of the following section.

9.4 Locative adverbs

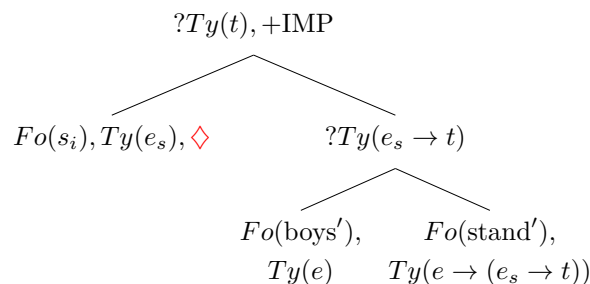
(9.23) ak-oḍo ak-atáǎá k-été kíǎá
 IMP.PL-come IMP.PL-stand.in.line LOC-1SG in.front
 ‘come, line up in front of me’ (THIEF:1.10)

In chapter 6 it was noted that words such as *kíǎa* in (9.23) are best described as locative adverbs rather than as prepositional phrases headed by *ka*. It is now possible to expand upon this distinction. A prepositional phrase like *kete* in (9.1) modifies a term (even when that term is an event) and might therefore be described as adjectival. On the other hand, a prepositional phrase like *a kuḅḅu* in (9.15) modifies a predicate and might therefore be described as adverbial. Analysing words such as *kíǎa* as locative adverbs suggests that they should be analysed in the same way as adverbial prepositional phrases, that is, as type $(e \rightarrow t) \rightarrow (e \rightarrow t)$ predicates. It was also noted in chapter 6 that these adverbs add detail to the location provided by the locative prepositional

phrase; in other words, they modify the prepositional phrase. Since the prepositional phrase projects a proposition whose predicate is a locative relation, it is straightforward to analyse the adverb as modifying this predicate.

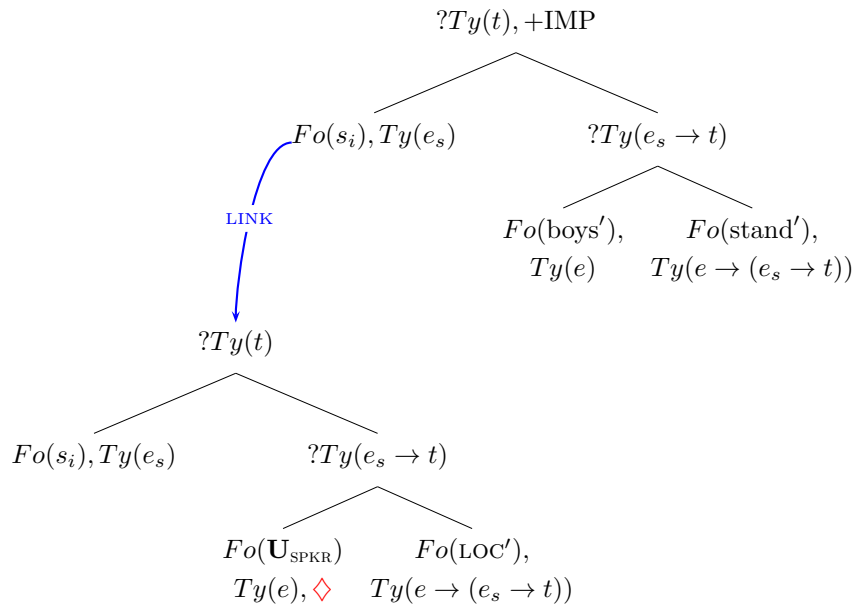
Under this analysis, the processing of sentence (9.23) will proceed in the following manner (ignoring the initial verb *akodo* for conciseness). As with all intransitive verbs, *atada*, ‘stand’, projects a full propositional template, of type $e \rightarrow (e_s \rightarrow t)$ including a metavariable decorating the logical subject node and a term decorating the event node. In the case of (9.23), the verb is in an imperative form. The imperative does two things: firstly, it specifies the addressee as the logical subject of the proposition; secondly, it adds extra information marking the fact that the speaker desires the addressee to bring about the event expressed by the proposition. Exactly how this is achieved formally is not relevant to the current discussion, so for now it is simply indicated by a *+IMP* imperative marker on the propositional root node and the proposition is otherwise treated as if it were declarative. I also assume that having parsed *akatada*, the logical subject is correctly identified with the addressee (in this case, the group of boys):

(9.24) Parsing *akata'da*



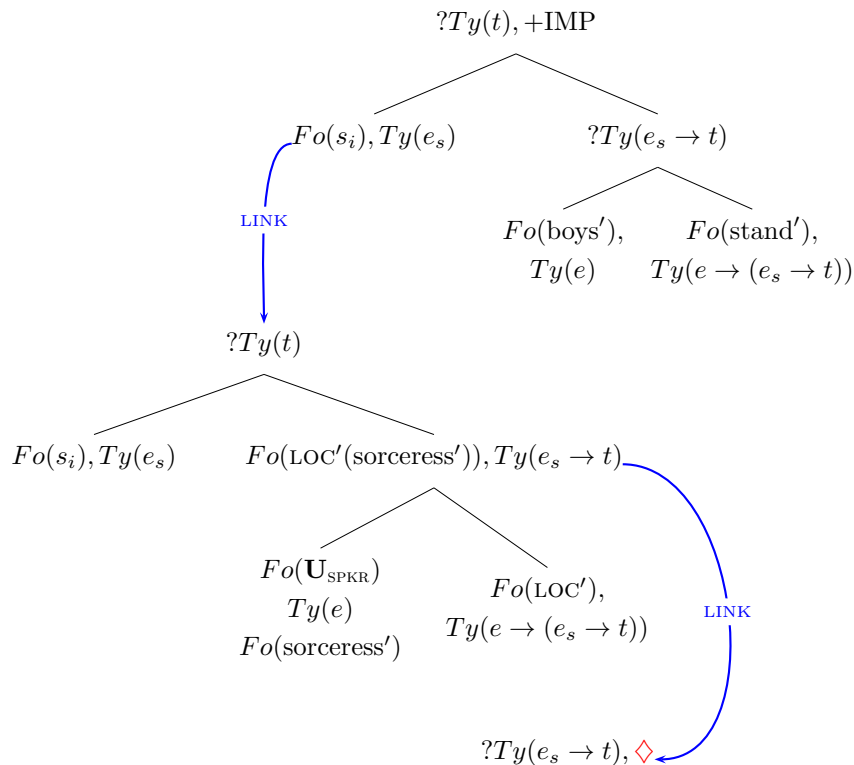
With the pointer on the event argument, the prepositional phrase *kete*, ‘LOC-me’ can be parsed, decorating a LINKed propositional tree just as in sections 9.1-9.2 above. The proposition projected by the prepositional phrase specifies that the event to which it is LINKed (s_i) stands in a *LOC'* relation with the speaker (9.25).

(9.25) Parsing *akata'da kete*



After the object metavariable is resolved (in this case, being identified from context as the sorceress), the pointer moves up to the type $e_s \rightarrow t$ requiring node and resolves the requirements in the usual way. This leads to a type-complete predicate node from which LINK APPPOSITION may apply, just as in section 9.3 (9.26).

(9.26) Applying LINK Apposition

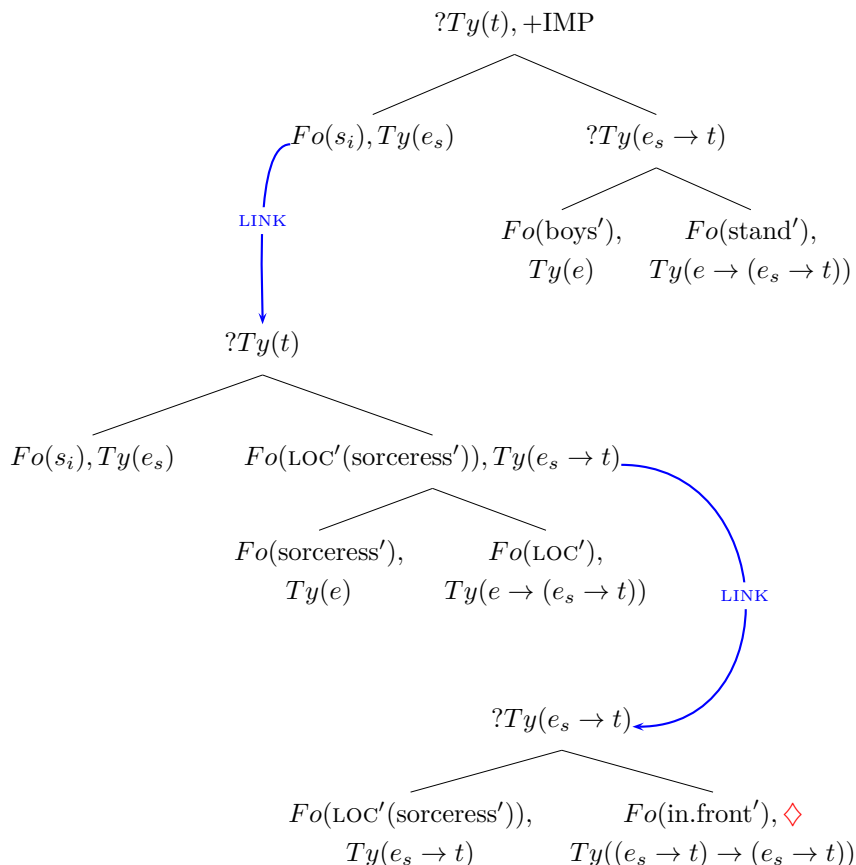


At this point the locative adverb is parsed. This is a one-place predicate whose argument is the locative expression, yielding a $Ty(e_s \rightarrow t)$ predicate. The trigger condition checks that there is a type complete predicate to be modified at the head of the LINK relation, and the actions then copy its formula value to the appropriate argument of the modifier.

(9.27)

IF	$?Ty(e_s \rightarrow t), \langle L^{-1} \rangle Fo(\alpha), Ty(e_s \rightarrow t)$
THEN	$\text{make}(\langle \downarrow_0 \rangle), \text{go}(\langle \downarrow_0 \rangle), \text{put}(Fo(\alpha), Ty(e_s \rightarrow t))$
kiʃa	$\text{go}(\langle \uparrow_0 \rangle), \text{make}(\langle \downarrow_1 \rangle),$
	$\text{put}(Fo(\text{in.front}'), Ty(e_s \rightarrow t) \rightarrow (e_s \rightarrow t))$
ELSE	Abort

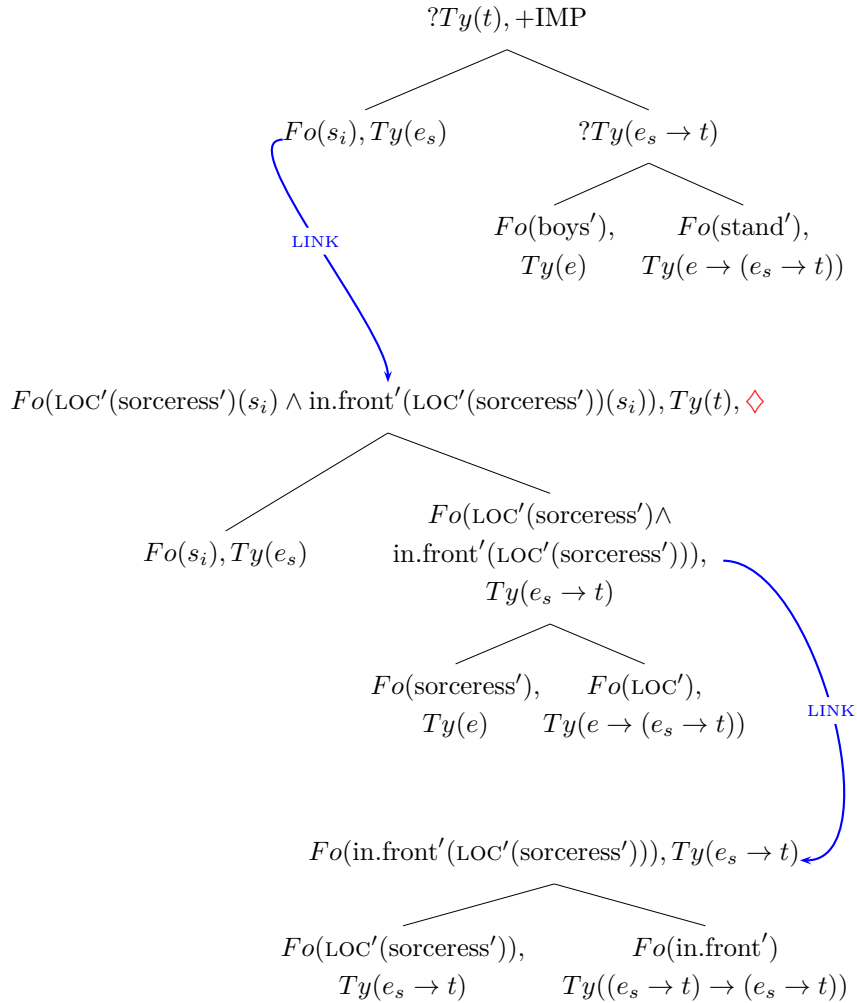
Following the actions in (9.27) builds the tree in (9.28).

(9.28) Parsing *akata'da kete kidha*

Compilation and evaluation of the tree can now take place in the usual ways. A step of APPOSITIVE LINK EVALUATION as described in section 9.3 conjoins the formula at the root node of the adverbial tree with that decorating the predicate node at the head of

the LINK to give this node the formula value $LOC'(sorceress') \wedge in.front'(LOC'(sorceress'))$. This conjoined predicate can then apply to the logical subject of the locative tree, which is the event argument, giving an interpretation for the locative modifier that event (s_i) stands in some locative relation with the sorceress and that it stands in a located-in-front-of relation with the sorceress. This tree is shown in (9.29).

(9.29) Applying APPOSITIVE LINK EVALUATION and compiling sub-tree

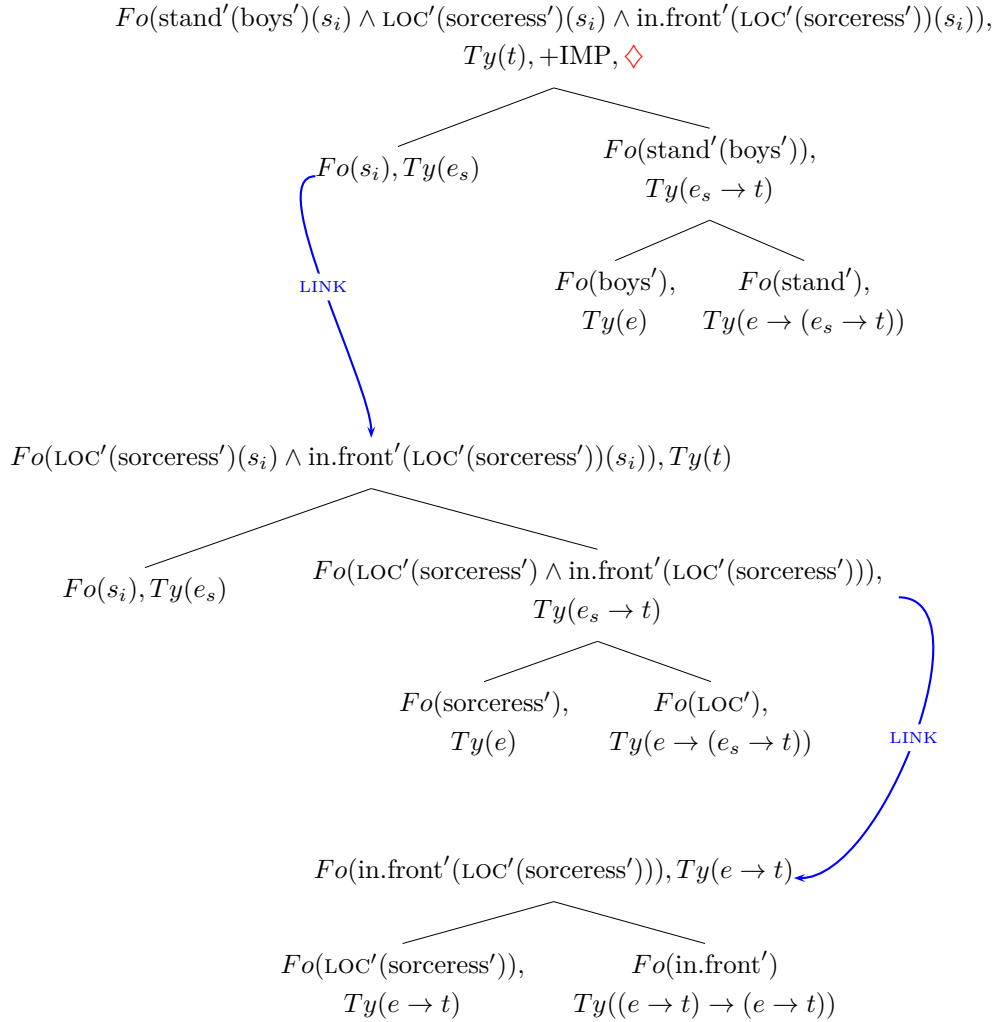


With the LINKed tree now complete, a step of LINK EVALUATION can apply leading to the final tree in (9.30) which represents the conjoined proposition that boys stand in event s_i , that the location of this event is the sorceress and that the location of this event is in front of the sorceress.

As an aside, it was noted in chapter 6 that *kuro*, ‘outside’, does not occur with locative noun phrases and it was hypothesised that this might be because of a semantic contradiction, the impossibility of being both ‘located at’ something and ‘outside’ it. The analysis given here formalises that hypothesis: these phrases give rise to a

conjunction of locative propositions, one conjunct from the *ka* phrase and one from the adverb. Obviously, there cannot be a contradiction between the two conjuncts.

(9.30) Final tree for *akata'da kete kidha*



This account of locative adverbs neatly combines the two types of modification outlined above. The locative prepositional phrase expresses a proposition which holds of a term; in that sense, it is adjectival in character. As described in section 9.1, the treatment given to such prepositional phrases here is reminiscent of the standard Dynamic Syntax treatment of relative clauses (Kempson *et al.* 2001; Cann *et al.* 2005): the preposition projects a predicate which holds of some term and this is expressed in a LINKed tree. The second type of prepositional phrase, as described in section 9.3, expresses a modification of a predicate; in that sense, it is adverbial in character. The treatment given to such phrases here is to make use of the standard DS action of LINK APPPOSITION: the preposition projects a predicate which holds of some predicate

and this is expressed in a LINKed tree. These two types of modification are then brought together by assuming that the predicate modified by the locative adverb is the predicate projected by the preposition. The account given here also explains why these words display behaviour which has led previous authors to analyse them variously as postpositions (Stevenson 1941; Reh 1983) or as adverbs (Dimmendaal 1987). They are adverbs because they modify a predicate, but they are very much part of the locative adpositional phrase. The fact that adpositions are construed as projecting predicates is crucial to this explanation.

9.5 Applicatives

Prototypical applicatives are valency increasing devices, which potentially constitutes a challenge to Dynamic Syntax. DS takes a strictly monotonic incremental approach to parsing. If the verb root and the applicative suffix are separate parsable morphemes, they must be processed in linear order. This would entail parsing the verb root first, following the associated lexical actions and building a propositional structure with either one or two argument nodes (for intransitive and transitive verbs respectively). The question of how the applicative morpheme could then add an additional argument node is non-trivial.

With this in mind, it is interesting to note that in chapter 7 applicative verb forms were described as possibly being more lexicalised than other verb extensions. Whereas the majority of verb extensions, with the possible exception of antipassive, appear to be phonologically discrete morphemes which may be suffixed to any semantically appropriate verb, the applicative has a number of forms, the choice of which is lexically driven. Moreover, unlike most verb extensions, some forms of the applicative harmonise with the vowels of the root suggesting a closer ‘connection’ between the root and the affix. Following Kaye’s (1989; 1995) hypothesis that the main purpose of phonological phenomena is to facilitate parsing, these facts might be taken as evidence that the applicative suffix is not stored as a separate lexical entry, but that applicative verb forms are stored in the lexicon as a unit.

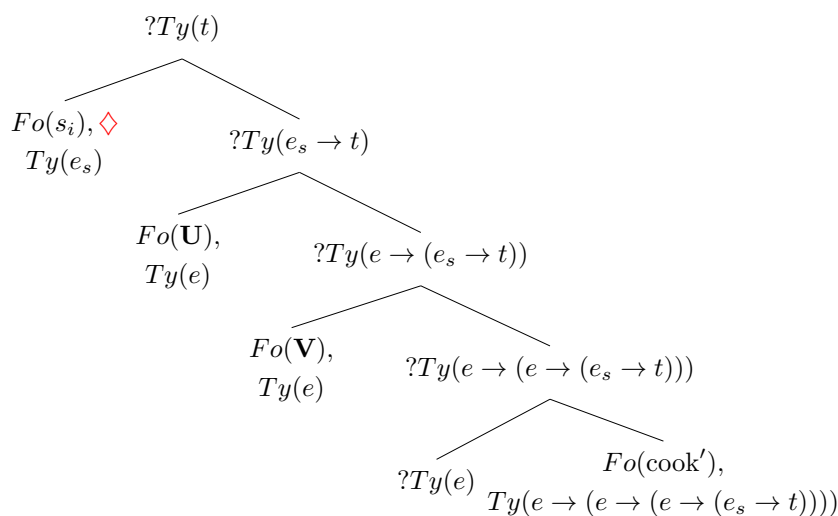
If this is so, it is straightforward to define a lexical entry (9.32) for an applicative verb such as *monitá* in (9.31) which constructs a partial tree with three argument nodes as in (9.33).

- (9.31) *akká m-uni-tá kúri a kúkkû*
 woman 3F-make-APPL food DAT Kuku
 ‘The woman is cooking food for Kuku’

(9.32)

munítá	IF ? <i>Ty</i> (<i>t</i>) THEN make($\langle \downarrow_1 \rangle$), go($\langle \downarrow_1 \rangle$), put(? <i>Ty</i> (<i>e_s → t</i>)) make($\langle \downarrow_1 \rangle$), go($\langle \downarrow_1 \rangle$), put(? <i>Ty</i> (<i>e → (e_s → t)</i>)) make($\langle \downarrow_1 \rangle$), go($\langle \downarrow_1 \rangle$), put(? <i>Ty</i> (<i>e → (e → (e_s → t))</i>)) make($\langle \downarrow_1 \rangle$), go($\langle \downarrow_1 \rangle$), put(<i>Fo</i> (cook'), <i>Ty</i> (<i>e → (e → (e → (e_s → t))</i>))) go($\langle \uparrow_1 \rangle$), make($\langle \downarrow_0 \rangle$), go($\langle \downarrow_0 \rangle$), put(? <i>Ty</i> (<i>e</i>)) go($\langle \uparrow_0 \rangle$, $\langle \uparrow_1 \rangle$), make($\langle \downarrow_0 \rangle$), go($\langle \downarrow_0 \rangle$), put(<i>Fo</i> (V), <i>Ty</i> (<i>e</i>)) go($\langle \uparrow_0 \rangle$, $\langle \uparrow_1 \rangle$), make($\langle \downarrow_0 \rangle$), go($\langle \downarrow_0 \rangle$), put(<i>Fo</i> (U), <i>Ty</i> (<i>e</i>)) go($\langle \uparrow_0 \rangle$, $\langle \uparrow_1 \rangle$), make($\langle \downarrow_0 \rangle$), go($\langle \downarrow_0 \rangle$), put(<i>Fo</i> (<i>s_i</i>), <i>Ty</i> (<i>e_s</i>)) ELSE Abort
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(9.33)



A couple of comments can be made about this approach. The extra, dative argument appears to be obligatory, that is, pro-drop is not permitted for indirect objects.⁶ The verb therefore decorates the indirect object node with a requirement for a formula of type *e* rather than with a metavariable. Also, if a lexical analysis is the correct approach, it implies that the dative *a* in this case is simply a case marker of the noun, marking the fact that it decorates the lowest argument node (the indirect object) of

⁶I have not found any examples of an applicative verb with an implied indirect object, and given that the purpose of the applicative is to license an extra argument, it would be surprising if this argument was minor enough to be silent.

the propositional structure. Since the indirect object of a ditransitive verb like *adánnyá*, ‘give’, is also marked with *a*, this is not an unreasonable conclusion. Case is discussed further in section 9.6.

A lexical analysis of applicative verbs is quite straightforward to implement in Dynamic Syntax and in the case of Katcha there are possibly some morphophonological arguments in favour of such an analysis. However, it is still worth considering whether an analytic approach may be possible. Even if Katcha applicatives are lexical rather than analytic, it is unlikely that applicatives are lexical in *all* languages, so a preliminary sense of how applicative morphemes might contribute to the semantics of a proposition is no bad thing. Indeed, considering any linguistic phenomenon from the point of view of a novel theoretical framework might provide new insights that would otherwise be missed.

One approach to providing an analytic characterisation of the applicative is that presented by Marten (2002). Marten gives Swahili applicative verbs a lexical analysis on the basis that ‘the applicative morpheme does not provide lexical access because it does not constitute a phonological domain’ (Marten 2002:187), but he does give a sketch of how an analytic construal of the applicative might proceed (Marten 2002:184-185). His version of DS incorporates an underspecified semantic type e^* . According to this view, a verb projects a semantic predicate of the underspecified type $e \rightarrow (e^* \rightarrow t)$, allowing it to take any number of arguments. Furthermore, the predicate decorates an unfixed node in the first instance. The tree node address and the semantic type for the verb are then resolved after all arguments have been processed. For ‘standard’ DS, however, adding an additional argument after the verb has been parsed - if we assume that this is the applicative’s function - would seem to constitute a major challenge to the Dynamic Syntax framework.

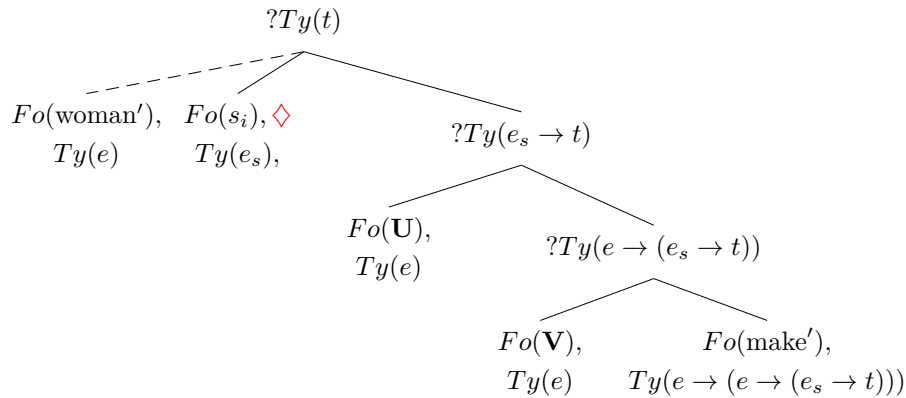
An alternative approach would be to assume that the nominals licensed by applicatives should, on a semantic level, be analysed not as arguments of the verb but as adjuncts. Languages with applicatives prototypically have semantically equivalent non-applicative constructions where the peripheral arguments are marked as oblique by means of, for example, adpositions. The alternation between the applicative construction and its adpositional equivalent generally conveys discourse-level or pragmatic effects (Peterson 2006:45-51; see also Marten 2002:192-198 for Swahili examples). As such, in a framework like Dynamic Syntax where the only level of representation is semantic, the parsing of an applicative construction and the equivalent adpositional construction should ultimately derive the same logical form. The same analysis given to prepositional phrases should also be given to applied objects.⁷

⁷In fact, this is exactly what Marten (2002) does, though from the other direction. Rather than treating applicatives as adjuncts like prepositional phrases, prepositional phrases (and all ‘adjuncts’), are treated as additional arguments.

Rather than a lexical approach treating *munitá* as a three-place predicate, as in (9.32-9.33), an analytic approach would treat it as a two-place predicate with the applicative morpheme signalling the presence of an adjunct (in DS terms, constructing a LINKed tree).

The parsing of (9.31) under such an approach would begin with the parsing of the subject and verb, leading to the tree in (9.34).

(9.34) Parsing *akká muni*

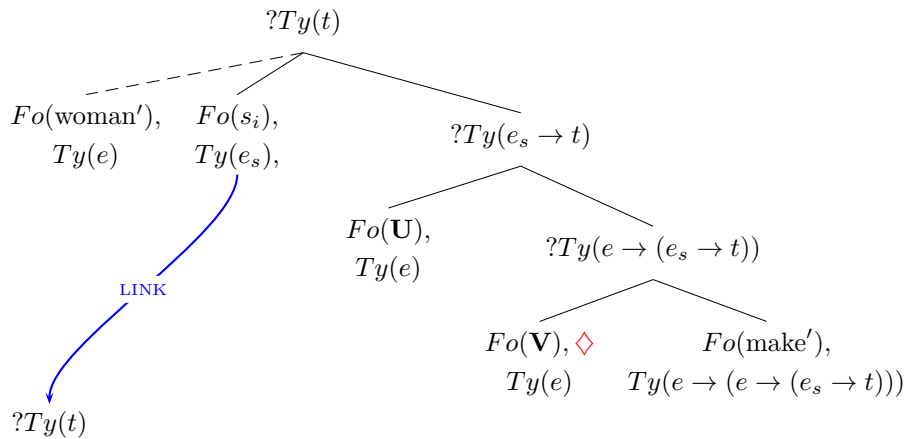


With the pointer on the event node, as is usual after parsing a verb, the applicative morpheme *-ta* is now parsed, according to the lexical entry given in (9.35), which builds a LINKed node, decorates it with a propositional requirement and returns the pointer to the matrix tree ready to parse the direct object, giving the tree in (9.36)

(9.35) Lexical entry for applicative *-ta*

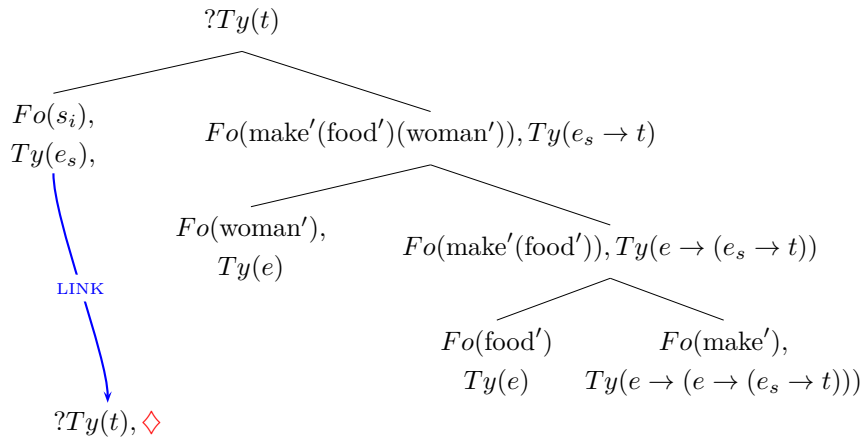
-ta	IF	$Fo(\alpha), Ty(e_s)$
	THEN	make($\langle L \rangle$), go($\langle L \rangle$), put($?Ty(e_s), ?\langle \downarrow_* \rangle Fo(\alpha), Ty(e_s)$)
		go($\langle L^{-1} \rangle, \langle \uparrow_0 \rangle, \langle \downarrow_1 \rangle, \langle \downarrow_1 \rangle, \langle \downarrow_0 \rangle$)
	ELSE	Abort

(9.36) Parsing *akká munitá*



The matrix tree can now be completed, the logical object node being resolved by parsing the object *kúri* and the logical subject node by unification with the unfixed node. The entire structure is not yet complete though, with an outstanding requirement on the LINKed node. This reflects the fact that **akká munitá kúri*, with its applicative verb form, is not a grammatical utterance. The pointer therefore moves to the outstanding node (9.37), requiring further lexical material to allow the parse to proceed.

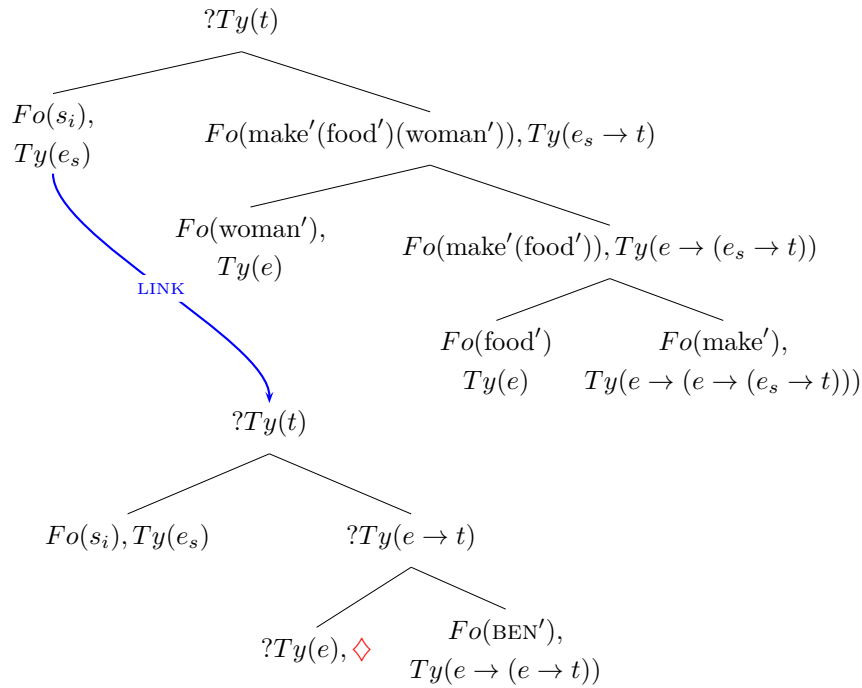
(9.37) Parsing *akká munitá kúri*



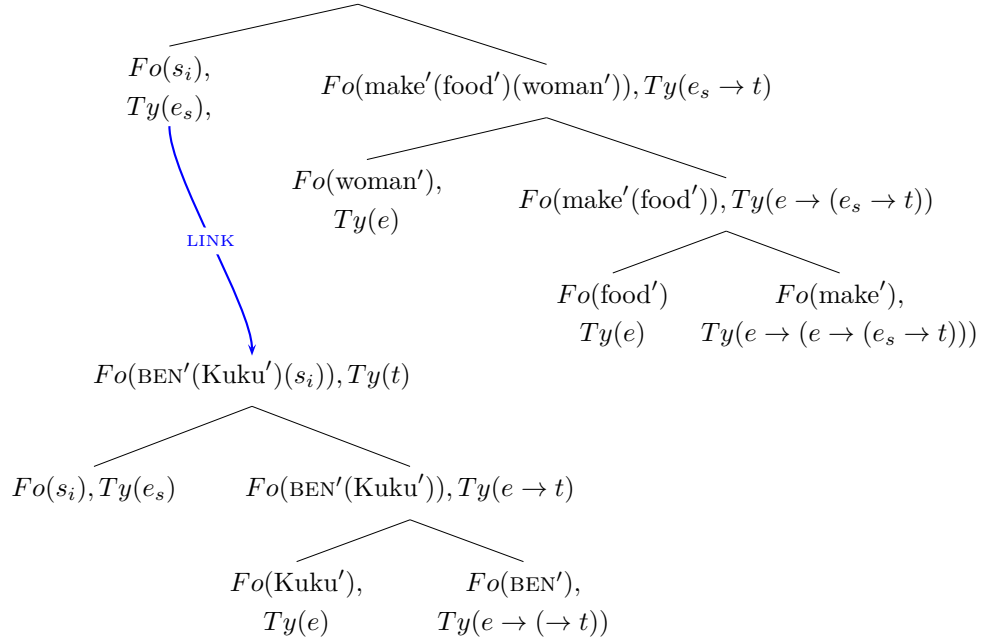
The additional lexical material comes from the dative noun phrase *a kúkkv*. Assuming for now that dative *a* is an ordinary preposition, its role will be parallel to that of *ka* described in section 9.1: it defines a relationship (in this case, benefactive) between its complement (Kuku) and the event it modifies (in this case, the woman making food).

The lexical actions are also parallel to those of *ka*, constructing a propositional tree whose logical subject is decorated with a copy of the event node from the head of the LINK and whose predicate node is decorated with a type $e \rightarrow (e_s \rightarrow t)$ predicate (9.38).

(9.38) Parsing *akká monitá kúri a*



After parsing the complement of the preposition the tree can be compiled in the normal way, the LINK Evaluation rule decorating the root node with a conjoined formula, expressing the proposition that a woman makes food in event s_i and that event s_i benefits Kuku.

(9.39) Final tree for *akká monitá kúrrí a kúkkú* $Fo(\text{make}'(\text{food}')(\text{woman}')(\text{s}_i) \wedge \text{BEN}'(\text{Kuku}')(\text{s}_i)), Ty(t), \diamond$ 

The approach laid out here explains the grammaticality of (9.31) and it correctly predicts the ungrammaticality of **akká monitá kúrrí*, because the applicative morpheme is construed as projecting a (LINKed) requirement which entails parsing some additional lexical items to resolve it. The presence of the applicative morpheme entails the presence of the benefactive argument. Nonetheless, the account as it stands is too powerful. The lexical actions of the applicative marker duplicate those of LINK INTRODUCTION. Since LINK INTRODUCTION is an optional computational rule, there is no need to also have a lexicalised version, rendering the analysis rather less elegant. More importantly, it predicts that the benefactive noun phrase could occur grammatically *without* the applicative morpheme being present, decorating a $?Ty(t)$ node constructed by LINK INTRODUCTION just like any other event-modifying preposition. Likewise, this account predicts that *any* event-modifying preposition could follow the applicative morpheme. The lexical actions of the applicative morpheme build a LINKed node and decorate it with a $?Ty(t)$ requirement; this is exactly the context for parsing a preposition. Thus the current account incorrectly predicts that a sentence like **akka monita kúrrí ka kúkkú*, with both an applicative verb and a locative phrase, should be grammatical.

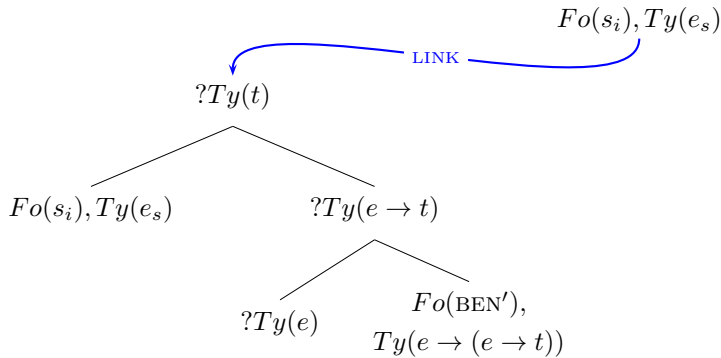
The problem with this account is that it ascribes the semantic content (BEN') to the 'preposition', leaving the applicative morpheme to undertake a purely structural task (and one for which there is a pre-existing computational rule). Yet in prototypical applicative constructions, the applicative morpheme clearly makes a semantic contri-

bution (many languages have multiple applicative markers with different meanings). Likewise, in prototypical applicatives there is an alternation between semantically (if not pragmatically) equivalent applicative and adpositional constructions. It should therefore be expected that an applicative morpheme will in fact build the same semantic structure as a preposition. A lexical entry for a prototypical applicative morpheme then might look more like (9.40), which builds a LINK from an event node, but also builds the LINKed propositional structure, decorating the nodes as appropriate (including a Formula value for the predicate node), then moves the pointer back to the matrix tree. These actions build the partial structure indicated in (9.41).

(9.40) Lexical entry for applicative *-ta* (revised)

-ta	IF $Fo(\alpha), Ty(e_s)$ THEN $make(\langle L \rangle), go(\langle L \rangle), put(?Ty(t))$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(?Ty(e \rightarrow t))$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(Fo(BEN'), Ty(e \rightarrow (e \rightarrow t)))$ $go(\langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(?Ty(e))$ $go(\langle \uparrow_0 \rangle, \langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle) put(Fo(\alpha), Ty(e_s))$ $go(\langle \uparrow_0 \rangle, \langle L^{-1} \rangle, \langle \uparrow_0 \rangle)$ ELSE Abort
-----	---

(9.41) Partial tree constructed by applicative morpheme (revised)



This revised account treats applicatives essentially as prepositions. This idea is supported by the semantic equivalence that often exists between adpositions and applicatives and also by the fact that from the point of view of grammaticalization, adpositions are one of the primary sources for applicative morphemes (Peterson 2006:125-129). Since there is a synchronic and diachronic connection between prepositions and applicatives, it should not be surprising to find that they are analysed in almost the same way as one another. The major difference between the two constructions is that the complement of an adposition is collocated with it in the string forming what would

in traditional grammar be termed a syntactic constituent, whereas the complement of an applicative, the applied object, may be separated from it.

There are then two possible ways of analysing applicatives. The analytic approach has a slight semantic advantage: it expresses the semantic role of the applied object by projecting an additional predicate to related the applied object to the main proposition. In Katcha there is only one possible role, benefactive, but other languages may have more than one applicative morpheme assigning different roles. The analytic analysis as laid out here also captures the similarity in function between applicatives and prepositions. The lexical approach has a slight empirical advantage: in Katcha there are phonological indications that applicative verbs are more likely to be lexicalised than verbs with other extensions.

It has been mentioned more than once that the Katcha applicative is somewhat atypical. One of the ways this is true is the presence of the *a* marker before the benefactive argument. If we adopt the analytic analysis of applicatives, where the lexical actions of the applicative are essentially equivalent to those of an adposition, the implication is that *a* is not a preposition. Rather its role is presumably simply to mark which noun phrase is the applied object; in other words, it is a case marker. Alternatively, if we adopt the lexical analysis, the benefactive argument is an argument of the verb and so once again *a* must be a case marker. As noted above, the indirect object of a ditransitive verb is also marked with *a*, which also supports the idea that *a* is a case marker that does not supply any substantive semantic content. A discussion of case is the focus of the next section.

9.6 Case markers

As noted in chapter 6, the boundary between case markers and adpositions is somewhat fuzzy, yet the analyses that have been proposed for case in Dynamic Syntax look rather different from the treatment of prepositions proposed here, at least on the surface. Case has been treated as defining ‘filters on output, imposing requirements on a node which constrain subsequent development’. Specifically, case constrains which node in the tree a noun may decorate (Cann *et al.* 2005:236). For example, nominative case can be modelled as a requirement $?\langle \uparrow_0 \rangle Ty(e_s \rightarrow t)$ imposed on a term node requiring that its mother takes the propositional event node as an argument, thus that term must be the logical subject. Case is therefore primarily structural. This contrasts with the analysis of adpositions proposed above in which prepositions introduce subordinate propositions that modify some term in the matrix proposition. Adpositions therefore contribute semantic content. This apparent difference is surprising if there really is ‘no necessary universal distinction’ (Payne 1997:100) between adpositions and case markers. But the difference does not lie in whether a particular lexical item is classed

as an adposition or a case marker. The difference between the two structures lies in the relationship between the semantic role of the nominal and the participant roles required by the verb. Where the noun phrase has a core argument role, the required roles are defined by the subcategorization properties of the verb and case can be thought of as specifying which of these argument roles a given noun phrase fulfils. Where the noun phrase has an optional, oblique role, the case marker or adposition must itself specify the semantics. To put this in terms of the tree construction process, in the case of core arguments the argument nodes are constructed as part of the lexical actions of the predicate and case then constrains the further development of these pre-existing nodes, ensuring they are decorated correctly; in the case of oblique arguments, the argument nodes must be constructed by the adposition/case marker, along with the relevant predicate.

So one possibility is that dative *a* is a case marker in the standard DS sense, its lexical actions acting as a filter on pre-existing structure rather than building new structure. If so, this would explain why it requires to be licensed by the applicative marker on the verb. A further piece of evidence in support of this is the fact that *a* marks the indirect object of ditransitive verbs such as *anánjá*, ‘give’. In this case, the indirect object node is presumably constructed as part of the propositional tree projected by the verb, so again, the dative does not need to build new structure.

A quite different construction involving an *a* morpheme marking a noun is found in (9.42), where there is an example of *a* marking a subject. Norton (2008a:9) suggests it marks a change of subject within the discourse and such an analysis seems plausible in this case, where the first clause focuses on the ravens, before the second clause brings in *sɔkɔ* (‘God’) as the subject.

- (9.42) Aaga iiri nakaaru taalo katiniiki kitaalo karaana ka
 a:k- i:ri na-ka:ru ta:lɔ k-atini-iki k-ita:lɔ k-ara-ana ka
 IMP.PL-look PL-crow NEG NPL-plant-ANTIP NPL-NEG NPL-cut-ANTIP LOC
 nasigeene, taalo na'boode kene nja naküdhü,
 na-sika-ene ta:lɔ na-bɔ:te k-ene nca na-kuɸu,
 PL-field-PL NEG PL-barn LOC-3NPL ACCOMP PL-hiding.place,
 a Sogo sa ka amana kuri eene
 a sɔkɔ sa ka amana kuri e-ene
 SUBJ God even DCM give food DAT-3NPL

‘Consider the ravens: They do not sow or reap, they have no storeroom or barn; yet God feeds them.’ (LUK 12.24)

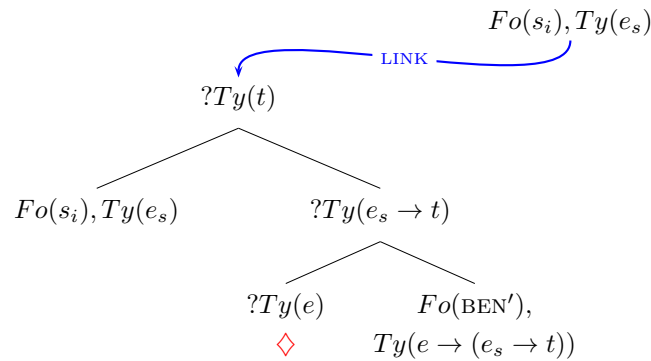
Subject-marking *a* appears to be a bound morpheme which prefixes to the noun.⁸

⁸This is also true of dative *a*.

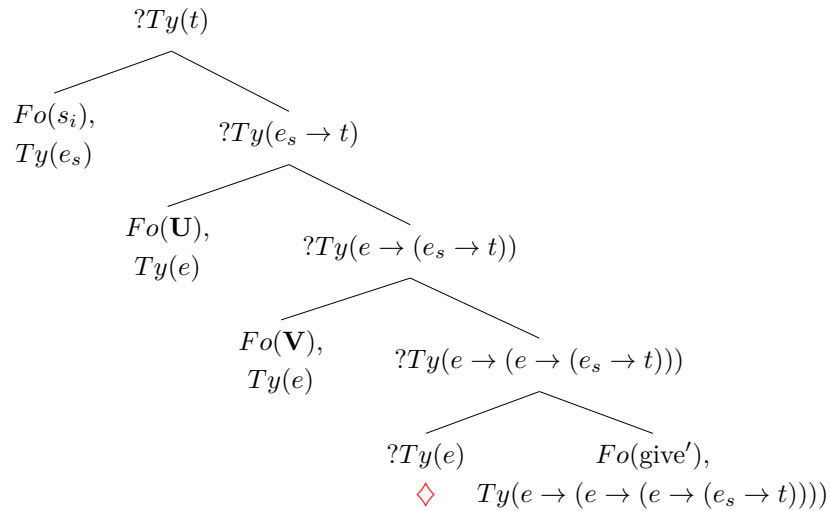
It always occurs at the left periphery of the clause, which often shows non-canonical verbal morphology marking the verb either with infinitive *t-* or, as here, the dependent clause marker *ka*. A detailed analysis of these sorts of discourse features is outwith the scope of the current study, but whatever the analysis, it seems clear that nouns marked with *a* are not treated by the syntax as canonical subjects. It may well be more accurate to think of them as something like hanging topics.

The fact that this appears to be another case of a noun being marked by an *a* brings up the intriguing possibility is that this subject-marking *a* and the dative *a* may in fact be the same morpheme. That is, it may be possible to characterise the lexical actions of dative *a* in a way that captures all three constructions in which *a*-marked nouns occur. (9.43) sketches the immediate contexts of each of these with the relevant node highlighted by the presence of the pointer: as the applied object of an applicative verb (a), as the indirect object of a ditransitive verb (b), and preverbally as something like a newly introduced topical subject (c).⁹

(9.43) a.



b.



⁹For illustrative purposes, I assume that the third of these contexts is a ‘hanging topic’.



The contexts illustrated in (9.43b) and (9.43c) can be brought together under the single notion that dative nouns decorate a term node which is neither the logical subject nor the logical object of the proposition. In other words the dative case simply marks nouns which are neither the subject nor the object of their clause. In terms of modal tree logic, the logical subject node may be defined as $\langle \uparrow_0 \rangle \langle \uparrow_1 \rangle Ty(t)$ and the logical object node may be defined as $\langle \uparrow_0 \rangle \langle \uparrow_1 \rangle \langle \uparrow_1 \rangle Ty(t)$. The lexical actions of the **a** case marker therefore involve decorating the node under development with requirements that neither of these two descriptions hold at that node. However, this characterisation precludes (9.43a), where the dative noun decorates the open $?Ty(e)$ node in an applicative construction. To incorporate this possibility, dative **a** requires a disjoint lexical entry with a disjunct making reference to the fact that an applicative has been parsed (9.44).¹⁰

(9.44) Lexical entry for dative **a**

IF	$?Ty(e)$	
THEN	IF	$\langle \uparrow_0 \rangle \langle \downarrow_1 \rangle Fo(BEN'), Ty(e \rightarrow (e_s \rightarrow t))$
a	THEN	$put(?Ty(e))$
	ELSE	$put(? \neg \langle \uparrow_0 \rangle \langle \uparrow_1 \rangle Ty(t), ? \neg \langle \uparrow_0 \rangle \langle \uparrow_1 \rangle \langle \uparrow_1 \rangle Ty(t))$
ELSE	Abort	

When the pointer is on an open term node, the actions in (9.44) check whether it is an applied argument (that is, whether the current node is an argument of the BEN' predicate projected by the applicative morpheme). If so, no action need be taken and parsing may proceed. To allow this formally a 'dummy action' is carried out duplicating the type requirement which already decorates the node and thus adding no further information to the tree. If the node under development is not the argument of such a predicate, the actions decorate the node with modal requirements expressing the fact that the current node cannot be either the logical subject ($? \neg \langle \uparrow_0 \rangle \langle \uparrow_1 \rangle Ty(t)$) or the logical object ($? \neg \langle \uparrow_0 \rangle \langle \uparrow_1 \rangle \langle \uparrow_1 \rangle Ty(t)$).

The lexical entry in (9.44) illustrates two different ways in which context dependence may be formalised. The actions of the second disjunct reflect the usual DS construal of case, defining the context in which the formula value of the node must ultimately be interpreted (in this case the fact that it cannot be subject or object). These actions

¹⁰This is not an issue if applicative verbs are in fact lexicalised. In that case the structure in (9.43b) is the relevant one for applicative verbs as well as ditransitive verbs, and the lexical entry (9.44) does not need the disjunction.

constrain the further development of the tree and therefore decorate the node with requirements. The strong negation operator (\neg) is persistent (Kempson *et al.* 2001:289-290): the statements it scopes over ($\langle \uparrow_0 \rangle \langle \uparrow_1 \rangle Ty(t)$ and $\langle \uparrow_0 \rangle \langle \uparrow_1 \rangle \langle \uparrow_1 \rangle Ty(t)$) hold for the current partial tree but also for all subsequent tree developments. Thus the use of requirements ensures that these conditions will be met at all subsequent stages of the parse, most importantly at the final evaluation of the tree.¹¹

Contrastingly, the first disjunct does not place any restrictions on future tree growth, it depends only on the presence of a particular morpheme (the applicative) in the immediately preceding context. It is therefore modelled as a condition within the lexical entry, allowing the parse to proceed only if the applicative morpheme has already been parsed. This action of checking the Formula value of the the predicate may seem stipulative, but this is simply a way of formalising lexical selection. The traditional way of describing lexical selection would be to say that an applicative verb selects a dative complement, but it is equally feasible to express the inverse - a dative noun is licensed by the presence of an applicative verb - and this is what the lexical entry expresses.¹²

A similar process of lexical selection takes place when personal pronouns occur as the complement of prepositions. As noted in chapter 6 there are two sets of personal pronouns, which may be described as ‘Core’ and ‘Oblique’. When used as a prepositional complement, the form of the pronoun is determined by the preposition. This selection is strongly lexical: many prepositions do not select only one type of pronoun, but ‘mix and match’ from the two sets. This makes it hard to define any pronominal feature which the lexical entry might subcategorize for. The best way to model this lexical stipulation is therefore to encode it within the lexical entry of the pronoun. This will mean the lexical entry for the pronoun has to be multiply disjunctive, but since there are a limited number of prepositions the disjunction will not be implausibly large. For example, (9.45) gives a possible lexical entry for the 3rd person masculine oblique personal pronoun *mí*:

(9.45) Lexical entry for *mí*

¹¹Though in fact, in the case of (9.43b-c) the node has a fixed address and so the requirements are satisfied immediately.

¹²In section 6.5 it was stated that most verbs do not select the forms of their arguments and this was given as a reason for thinking of oblique role markers as prepositions rather than case markers. Here we see an exception in that applicative verbs do select the form of their complement. This is further support for the argument (which came initially from the theoretical analysis) that *a* should be thought of as a dative case marker rather than a preposition.

<i>mí</i>	IF	$?Ty(e)$
	THEN IF	$\langle \uparrow_0 \rangle \langle \downarrow_1 \rangle Fo(\text{BEN}'), Ty(e \rightarrow (e_s \rightarrow t))$ $\vee \langle \uparrow_0 \rangle \langle \downarrow_1 \rangle Fo(\text{LOC}'), Ty(e \rightarrow (e_s \rightarrow t))$ $\vee \langle \uparrow_0 \rangle \langle \downarrow_1 \rangle Fo(\text{PLACE.OF}'), Ty(e \rightarrow (e_s \rightarrow t))$ $\vee \langle \uparrow_0 \rangle \langle \downarrow_1 \rangle Fo(\text{ACCOMP}'), Ty(e \rightarrow (e_s \rightarrow t))$ $\vee \langle \uparrow_0 \rangle \langle \downarrow_1 \rangle Fo(\text{SOURCE}'), Ty(e \rightarrow (e_s \rightarrow t))$
	THEN	$\text{put}(Fo(\mathbf{U}_{\text{MASC}}), ?\exists \mathbf{x}. Fo(\mathbf{x}), Ty(e))$
	ELSE	Abort

This construal of pronouns is a further indication of the connection between applicative and adpositional constructions. There is no indication in the lexical entry for *mí* of the fact that $Fo(\text{BEN}')$ was projected by an applicative verb while $Fo(\text{LOC}')$ was projected by a preposition. Both are simply suitable predicates the existence of which license the lexical actions of this particular form of the pronoun.

9.7 Conclusion

The basic proposal advanced in this chapter is that prepositional phrases should be treated as adjuncts. A prepositional phrase specifies an additional property of some expression of the matrix proposition. In other words, it provides a predicate which takes such an expression as one of its arguments. That expression may be a term (an individual or event) in the case of an adjectival PP, or a predicate in the case of an adverbial PP. In Dynamic Syntax terms, prepositions induce structure which is LINKed to the matrix propositional tree and which shares semantic content with some node in the matrix tree.

The approach to prepositional phrases proposed here treats adjectival prepositions somewhat differently to adverbial prepositions. Adjectival PPs are of type $e \rightarrow t$ while adverbial prepositions are of type $(e \rightarrow t) \rightarrow (e \rightarrow t)$. This distinction, of course, is reflective of the semantics. An adjectival PP has an intersective interpretation; it predicates over some term of the matrix proposition to express an additional proposition concerning that term. An adverbial PP has a subsecutive interpretation; it predicates over some predicate of the matrix proposition to express an additional property of that predicate. Nonetheless, both are prepositional phrases and it should be expected that they will behave in largely parallel ways. And in fact they do. Despite the different semantic types, all prepositions project a predicate that expresses some relation between their complement and the expression that they modify. This relation is not part of the core structure of the matrix proposition, but rather semantically enriches some expression within it. This can be modelled quite naturally as a separate structure connected to the modified expression by means of a LINK.

The construal of prepositional phrases as LINKed structures, and prepositions as

predicates, explicitly categorises them as modifiers. There are therefore substantial parallels to be seen between prepositional phrases and other modifiers. The distinction between intersective and subjective PPs, for example, parallels the same distinction seen in the semantics of adjectives. Indeed, Cann (In prep.) suggests an analysis for English adjectives which directly parallels the one given here: intersective adjectives induce LINKed structure from the internal variable of an epsilon term (ie. a $Ty(e)$ node), while subjective adjectives induce LINKed structure from the restrictor of an epsilon term (i.e. a $Ty(e \rightarrow t)$ node). Similarly, the treatment of prepositional phrases offered here draws explicit parallels between (adjectival) prepositional phrases and relative clauses. Both prepositional phrases and relative clauses project propositions which share an argument with the matrix proposition. It is therefore not surprising that they should use the same basic technical apparatus. The difference between them is that relatives include an anaphoric device (either a relative pronoun or a resumptive pronoun), which introduces the shared argument into their sub-proposition. Like bare relatives in English, prepositional phrases contain no such anaphoric device so the shared argument must be introduced by the LINK-COPY INTRODUCTION rule.

Sections 9.5 and 9.6 demonstrated that this analysis is also relevant to constructions other than prepositional phrases, and both applications have potential theoretical implications. In section 9.5 it was argued that applicatives can be treated in just the same way as prepositions, a stance which gains support from the fact that in many languages the two constructions are related by both a semantic equivalence and by a history of grammaticalization. The difference between the two constructions is one of constituency: the complement of a preposition immediately follows it, whereas the applied object (which is construed as the complement of the applicative morpheme) does not necessarily follow immediately after the applicative marker. To state that applicatives and adpositions are essentially equivalent is therefore something of a challenge to the importance of the notion of constituency, which is central to most theories of syntax.

It was noted in several places, both in chapter 6 and in the present chapter, that case markers and adpositions represent two ends of a continuum and that there is no great difference between them. However, in discussing the differences between the Dynamic Syntax construal of case and the account of adpositions given here, section 9.6 laid out what appears to be a quite clear distinction between them. Case is considered to be a filter on well-formed structure, specifying where a particular node may be situated in a tree, but providing no semantic content. On the other hand, adpositions induce a LINKed sub-tree, building semantic structure and contributing the Formula value of its predicate. The account offered here can therefore be argued to draw a substantive theoretical distinction between case and adpositions; the two are quite different within the DS framework. This apparently goes against the general view that

case and adpositions are actually very similar. However, ‘similar’ is not the same as ‘identical’. Payne offers a ‘rule of thumb’ for distinguishing case markers from adpositions which he suggests ‘probably works 90 percent of the time.’ This is the notion that case marking is imposed by the structure within which the noun phrase occurs, while adpositions may occur freely. By this definition, case may be ‘determined by the grammatical requirements of the verb (or other case-governing element)... Adpositional phrases are usually (though not always) “optional” sentence constituents’ (Payne 1997:100-101). The discussion of case and adpositions in section 9.6 might be thought of as something close to a DS-theoretic characterisation of this ‘rule of thumb’. With case, the propositional structure and semantic content is projected by the ‘verb (or other case-governing element)’; case markers simply decorate this structure with requirements to ensure the correct interpretation of the noun phrase. Adpositions on the other hand are “optional” sentence constituents’ because they construct a tree structure and decorate it with semantic content; moreover, the structure they project is an adjunct, a LINKed sub-tree. The two definitions of the difference between case and adpositions have a slightly different focus though and so they are not quite the same. Payne’s ‘rule of thumb’ focuses on the obligatoriness of case compared with the optionality of adpositional constructions; the Dynamic Syntax account offered here suggests that the difference is semantic: case morphemes are semantically null and build no structure, while adpositions contribute semantic content and also induce semantic structure. The observation that adpositions tend to be more optional is a reflection of the fact that, as modifying adjuncts, the structure they build is outside the main propositional tree.

The application of Dynamic Syntax to Katcha prepositional phrases uses only standard DS rules which have been motivated in other contexts for other constructions in other languages. Nonetheless, applying these rules to the Katcha data considered here has implications for our understanding of applicatives and case, as well as for our understanding of prepositional phrases. The key insight offered here is that prepositional phrases are predicates expressing additional information about some element of the core proposition of an utterance.

Chapter 10

Nominal Modifiers

Introduction

This chapter provides a Dynamic Syntax analysis of nominal modifiers in Katcha. It follows on from the arguments advanced in chapter 5 that nominal modifiers can be characterised as demonstrative pronouns or phrases headed by demonstrative pronouns which stand in apposition to the nouns that they modify. Section 10.1 sets out some context. It gives an analysis of nouns, noting that lexical nouns cannot be modified internally so they must project a fully specified epsilon structure, and discusses the process of LINK Apposition and its evaluation used to allow modification. Demonstratives are also covered, with a discussion of how a demonstrative pronoun can add specific referential content to a lexical noun phrase.

Section 10.2 gives an analysis of subject relative clauses. Crucial to this is an extension to the notion of the metavariable projected by the demonstrative pronoun such that it projects a partial epsilon term with a variable and binder, but no restrictor. The relative clause can then provide the restrictor.

A similar analysis is given in section 10.3 where it is suggested that a contextually provided possession predicate provides the restrictor to the epsilon term projected by the pronoun. Interestingly, it is shown that this has to be a ‘possessed by’ rather than a ‘possess’ relation, which fits the fact that possessive phrases in Katcha agree with the head noun and not the possessor.

Finally, in section 10.4, some brief suggestions are given as to how non-subject relatives may be analysed. It is noted that the analysis of demonstrative pronouns given here correctly predicts that non-subjects are unable to be relativised directly.

10.1 Demonstratives

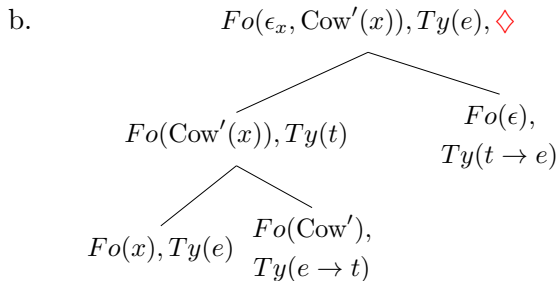
- (10.1) *mōsa asá:sá fįjō mō*
 Musa 3SG.want cow PROX.F
 ‘Musa wants this cow’

It was stated in sections 5.1.2 and 5.4.2 that there are no syntactic adjectives or determiners in Katcha. Lexical nouns alone form complete noun phrases, carrying the existential force which in other languages might be supplied by a determiner. It does not appear possible to modify a noun phrase ‘from within’, but only by means of an appositional phrase. In Minimalist language, one might say that all (lexical) DPs are made up only of nouns. From a Dynamic Syntax perspective, the implication is that Katcha common nouns are like names in projecting a fully specified epsilon structure. Rather than projecting a predicate to restrict an existentially quantified variable supplied by a determiner, the lexical actions associated with Katcha nouns also supply the variable and its binding (epsilon) operator. The actions associated with the lexical entry for *fįjō*, for example, would be as in (10.2a), projecting the structure in (10.2b).

- (10.2) Lexical entry for *fįjō* and resulting tree

a.

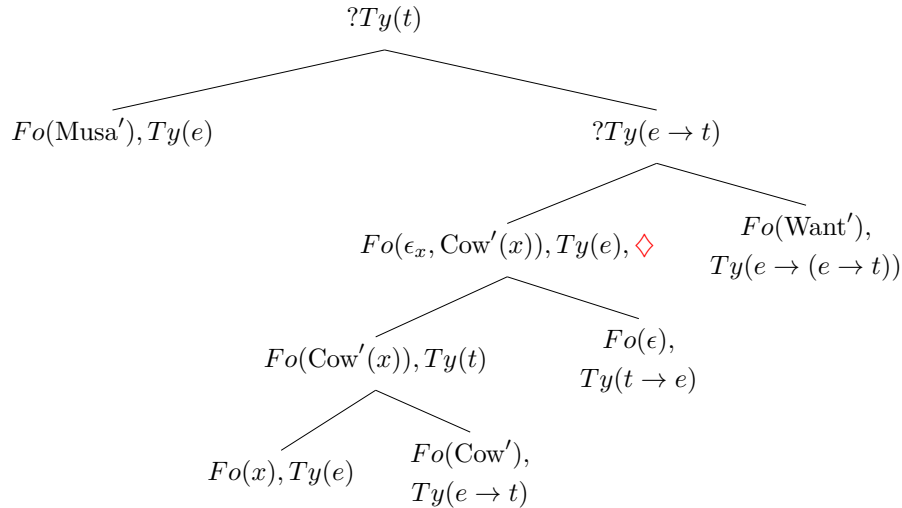
fįjō	IF $?Ty(e)$ THEN $put(Fo(\epsilon_x, Cow'(x)), Ty(e))$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(Fo(\epsilon), Ty(t \rightarrow e)),$ $go(\langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(Fo(Cow'(x)), Ty(t)),$ $make(\langle \downarrow_1 \rangle), go(\langle \downarrow_1 \rangle), put(Fo(Cow'), Ty(e \rightarrow t)),$ $go(\langle \uparrow_1 \rangle), make(\langle \downarrow_0 \rangle), go(\langle \downarrow_0 \rangle), put(Fo(x), Ty(e))$ $go(\langle \uparrow_0 \rangle \langle \uparrow_0 \rangle)$ ELSE abort
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These actions leave the pointer at the root node of the epsilon structure, decorating it with the formula value, $\epsilon_x, Cow'(x)$. The epsilon structure is fully specified by the lexical actions of the noun, preventing any internal modification of the noun.

Following these assumptions about nouns in Katcha, the parse of (10.1) will proceed as follows. After the first three words, *musa asá:sá fiǰo*, are parsed, the pointer is at the top type e node projected by the noun, yielding the tree shown in (10.3):¹

(10.3) Parsing *musa asá:sá fiǰo*:



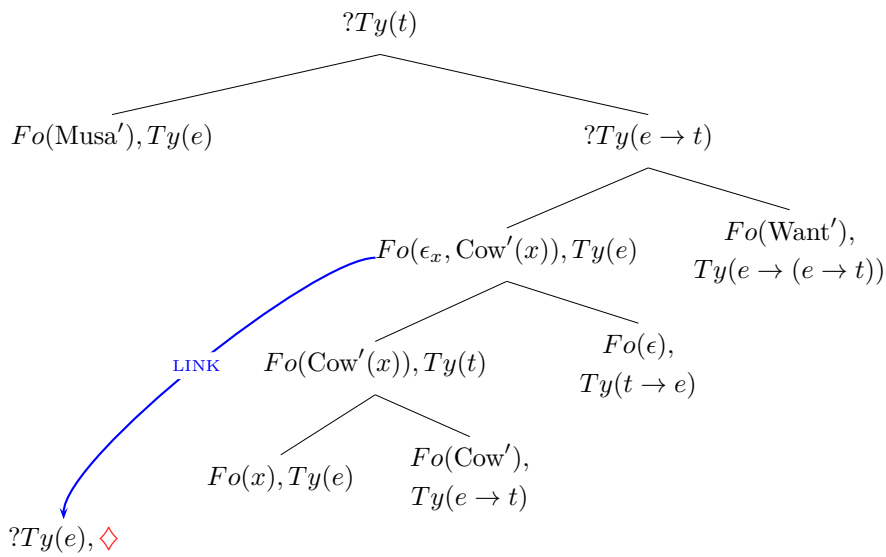
If there were no more words to parse, the tree could be compiled in the usual way, yielding a Formula value $Want'(\epsilon_x, Cow'(x))(Musa')$ on the propositional node. This would, of course, be the path followed in parsing the fully grammatical *musa asá:sá fiǰo*, ‘Musa wants a cow’. However, an alternative is to further specify the current node. In the case of (10.1), there is modification of the noun phrase by means of the appositive demonstrative pronoun. The computational action for inducing appositional structure, LINK APPPOSITION, was introduced in chapter 9 and is repeated here (10.4) This then yields the tree in (10.5).

(10.4) LINK APPPOSITION (type neutral)

$$\frac{\{ \dots \{ Tn(a), Ty(\alpha), \dots, \diamond \} \dots \}}{\{ \dots \{ Tn(a), Ty(\alpha), \dots \} \dots \}, \{ \langle L^{-1} \rangle Tn(a), ?Ty(\alpha), \diamond \}}$$

¹Throughout this chapter the situation argument is suppressed for ease of exposition.

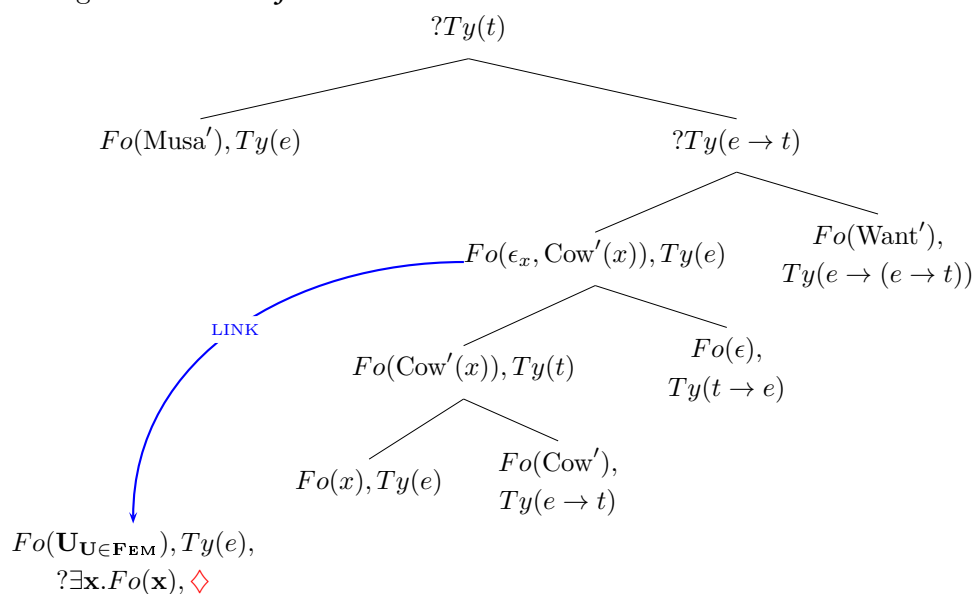
(10.5) Applying LINK APPPOSITION:



LINK Apposition is a quite general crosslinguistic computational rule. Having applied this general rule, a LINKed node is now available to be developed, requiring decoration of type e . This is a context in which a pronoun, a placeholder for some type e term, can be parsed. The lexical actions for the pronoun $m\acute{o}$, given in (10.6), decorate the LINKed node with a metavariable of type e (and a requirement for a formula value to instantiate it), yielding the tree in (10.7).

(10.6) Lexical entry for demonstrative pronoun $m\acute{o}$

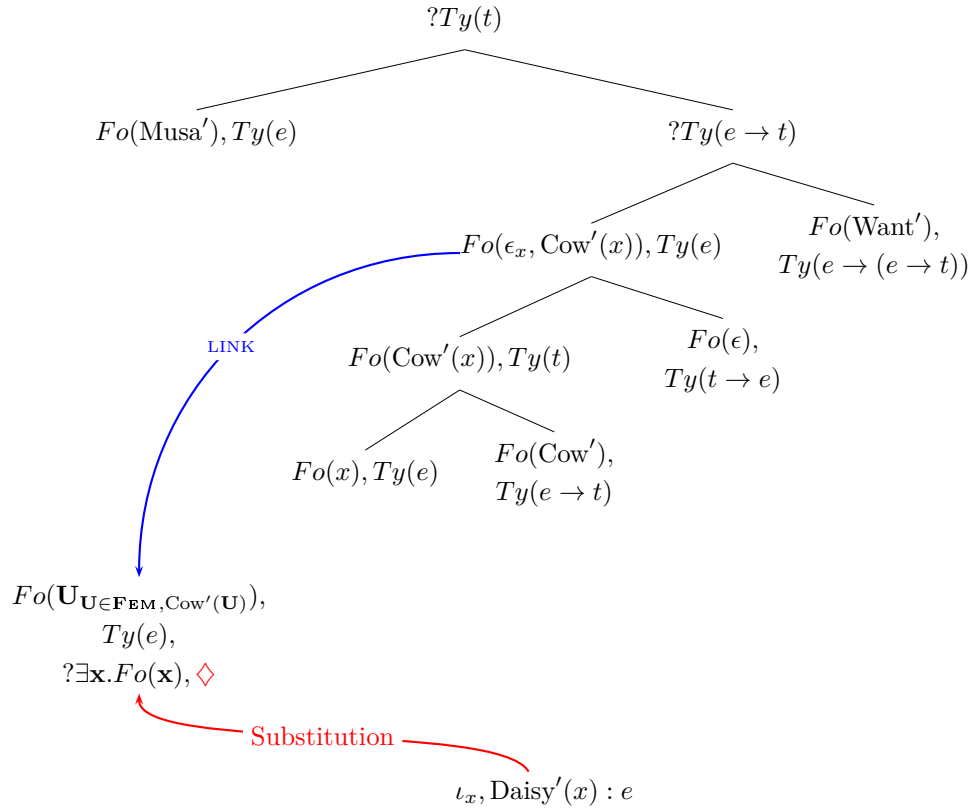
$m\acute{o}$	IF	$?Ty(e)$
	THEN	$\text{put}(Fo(\mathbf{U}_{\mathbf{U} \in \mathbf{FEM}}), Ty(e),$ $? \exists \mathbf{x}. Fo(\mathbf{x}))$
	ELSE	abort

(10.7) Parsing *musa asá:sá fijo mɔ:*

There is now no further lexical material to be parsed. Before the tree can be evaluated however, the metavariable projected by the demonstrative pronoun has to be instantiated by a step of SUBSTITUTION. This is simply a case of retrieving a suitable candidate from context, such as the particular cow the speaker is pointing at whilst producing the utterance. In principle the parser is free to choose any candidate, but the choice may be constrained by the grammatical gender of the pronoun (informally represented here as a restriction on the metavariable: ‘ $\mathbf{U} \in \mathbf{FEM}$ ’).

Assuming a suitable referent can be found, the process of SUBSTITUTION then enriches the type e node by replacing the metavariable with another type e expression. This will necessarily be a unique individual and can therefore be represented by a name. - an iota term² whose referent is the unique individual cow being referred to by the speaker, such as ‘Daisy’ (10.8):

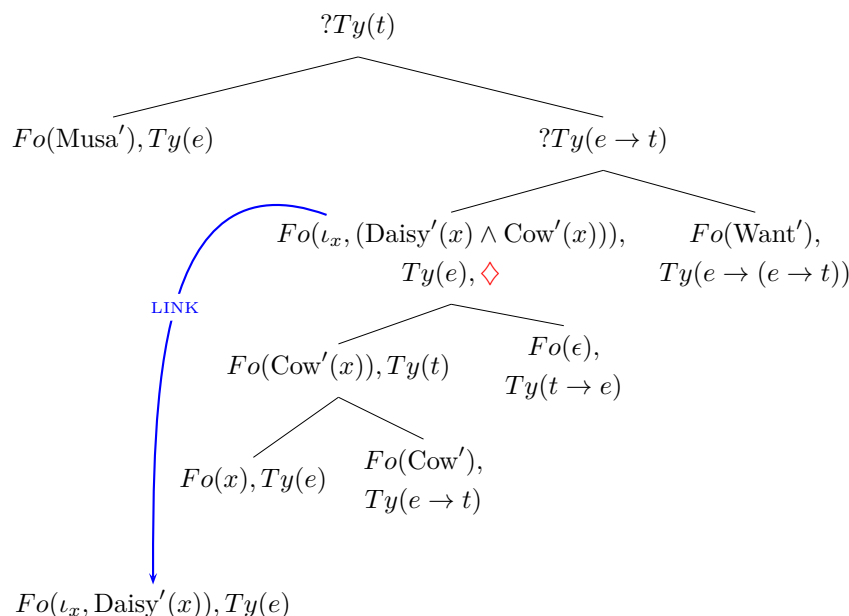
²In previous chapters, I have treated names as constants. However, in Dynamic Syntax they are more properly represented as ι -terms. These are essentially epsilon terms with the addition of a uniqueness presupposition: $\iota_x, F(x)$ picks out the *unique* individual who satisfies F .

(10.8) Instantiation of metavariable by SUBSTITUTION in *musa asá:sá fiḵḵ mós*:

The final stage in the process is the evaluation of the tree. At this point, the pointer is located at the root node of the LINKed ‘tree’, which consists solely of the iota term. The sole node in this sub-tree is properly decorated so the pointer may move up the LINK by means of some appropriate transition rule which evaluates the sub-tree with respect to the node to which it is LINKed. Such a rule, APPOSITIVE LINK EVALUATION, is given in Cann *et al.* (2005:365). This rule, as shown in (10.9), takes two LINKed epsilon terms and conjoins them in a single epsilon term with a complex restrictor. Where, as in the present case, one of the terms is an iota term, the conjoined term will also be an iota term (an iota term being the more specific instance of an epsilon term). Note also that this evaluation rule requires that the two epsilon terms contain the same variable, ie. both noun phrases refer to the same individual. Up to this point, nothing has stipulated that the two variables be unified (though this could easily have been incorporated as a modal requirement as part of the LINK APPPOSITION Rule if necessary). However, the formulation of the evaluation rule entails the identity of the two terms; the sentence can only be successfully parsed if ‘a cow’ and ‘this one’ refer to the same individual. In a sense this is simply the formalisation of a truism: two noun phrases in apposition refer to the same individual. Application of the evaluation rule (10.9) leads to the partial tree in (10.10):

(10.9) APPOSITIVE LINK EVALUATION:

$$\frac{\{\dots\{Tn(a), \dots, Fo(\epsilon_x, P(x)), Ty(e), \dots\}\} \quad \{\{\langle L^{-1} \rangle Tn(a), \dots, Fo(\epsilon_x, Q(x)), Ty(e), \dots, \diamond, \dots\}\}}{\{\dots\{Tn(a), \dots, Fo(\epsilon_x, (P(x) \wedge Q(x))), Ty(e), \diamond\}\}, \quad \{\{\langle L^{-1} \rangle Tn(a), \dots, Fo(\epsilon_x, Q(x)), Ty(e)\} \dots\}}$$

(Cann *et al.* 2005:365)(10.10) APPOSITIVE LINK EVALUATION in *musa asá:sá fijs mǎ*:

After this step in the parse, the logical object node is complete. The remainder of the tree can now be evaluated in the usual manner, ending up with a complete propositional formula (10.11) decorating the root node. Thus the parse of the sentence ultimately leads to the correct semantic interpretation: Musa wants a unique individual x , which is identified by the name ‘Daisy’ and is a cow.

(10.11) $Fo(Want'(\iota_x, (Daisy'(x) \wedge Cow'(x)))(Musa'))$

It is worth pausing at this point to compare this account of demonstratives as appositional pronouns with an account of a language where demonstratives are syntactic determiners. One such account is sketched in Cann (2007:28-31) for English definite NPs.³ In Cann’s account, a metavariable introduced by the definite determiner is restricted by a LINKed propositional tree whose predicate node is decorated by the nominal. This results in two LINKed $Ty(t)$ trees which are then evaluated using

³The sketch given in Cann (2007:28-31) is for definite NPs with *the* rather than demonstrative NPs with *this*; however, the DS account of definites is essentially anaphoric and therefore is directly relevant to the present discussion.

rules to (10.11) and (10.13) produces the obviously equivalent formulae in (10.11') and (10.13').⁵

$$(10.11') \quad \text{Daisy}'(a) \wedge \text{Cow}'(a) \wedge \text{Want}'(a)(\text{Musa}') \\ \text{where } a = \iota_x, (\text{Daisy}'(x) \wedge \text{Cow}'(x) \wedge \text{Want}'(x)(\text{Musa}'))$$

$$(10.13') \quad \text{Daisy}'(a) \wedge \text{Want}'(a)(\text{Musa}') \wedge \text{Cow}'(a) \\ \text{where } a = \iota_x, (\text{Daisy}'(x) \wedge \text{Want}'(x)(\text{Musa}') \wedge \text{Cow}'(x))$$

In one sense, this result is unremarkable. We should expect that the semantic interpretation of the Katcha sentence should be equivalent to the corresponding English sentence; anything else would be problematic. Nonetheless, it is a nice result in the sense that, while the final formula value reflects the semantic equivalence between the two languages, the different tree structures produced by the parsing process reflect the differing strategies of the two languages. English noun phrases and Katcha noun phrases are structured somewhat differently, but the actions and rules used in the parsing process, such as the construction and evaluation of LINK relations, are standard DS rules and not language-specific. Applying them in the normal way to either the Katcha data or the English data leads to the correct result.

10.2 Subject Relatives

$$(10.14) \quad \text{musa asá:sá} \quad \text{fijɔ} \quad [\text{m-akú} \quad \text{ɔ:jɔ} \quad \text{mɔ} \quad] \\ \text{Musa 3SG.want cow PROX.F-eat grass PROX.F} \\ \text{'Musa wants the cow which is eating grass'}$$

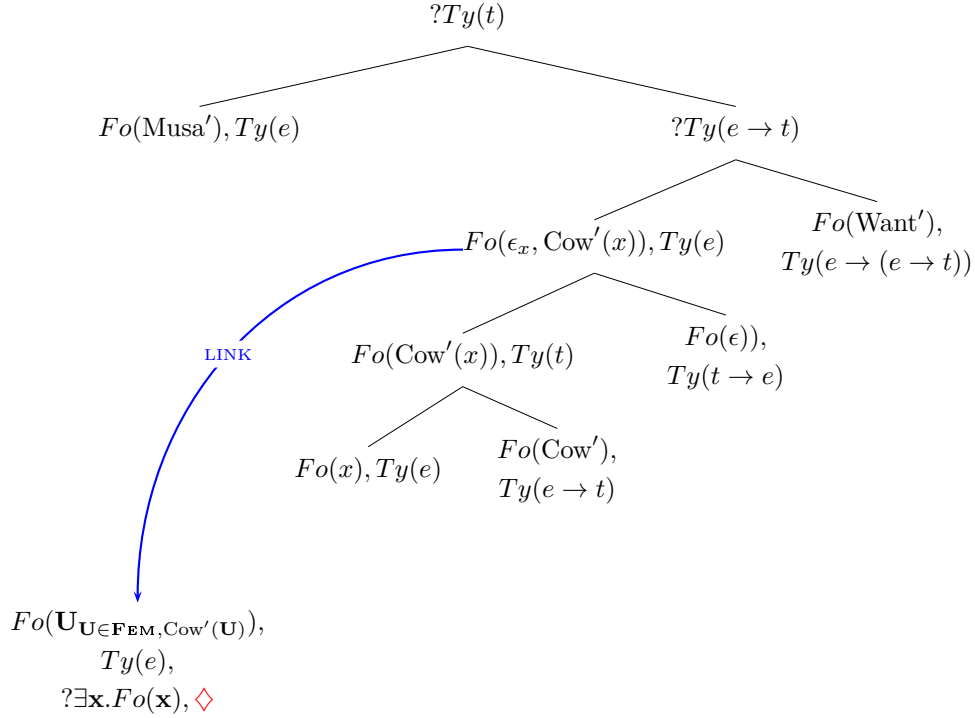
The Dynamic Syntax account of relative clauses generally is to treat them as a propositional sub-tree LINKed to a type e node projected by the modified noun. In the case of Katcha however, the relative clause is not introduced by a distinct relativiser, but by the demonstrative pronoun. As such, the sub-tree projected by the relative 'clause' is not a propositional tree, but a tree of type e , an epsilon term. This analysis reflects formally the descriptive analysis argued for in chapter 5: in (10.14) *makú ɔ:jɔ mɔ* is not a clause ('which eats grass') directly modifying the head noun *fijɔ*, but a nominal ('the one eating grass') standing in apposition to it.

The parsing of (10.14) may then proceed along the following lines. After parsing the main clause, constructing a LINK to a $?Ty(e)$ node and parsing the demonstrative pronoun, the partial tree in (10.15) has been constructed. This is identical to the

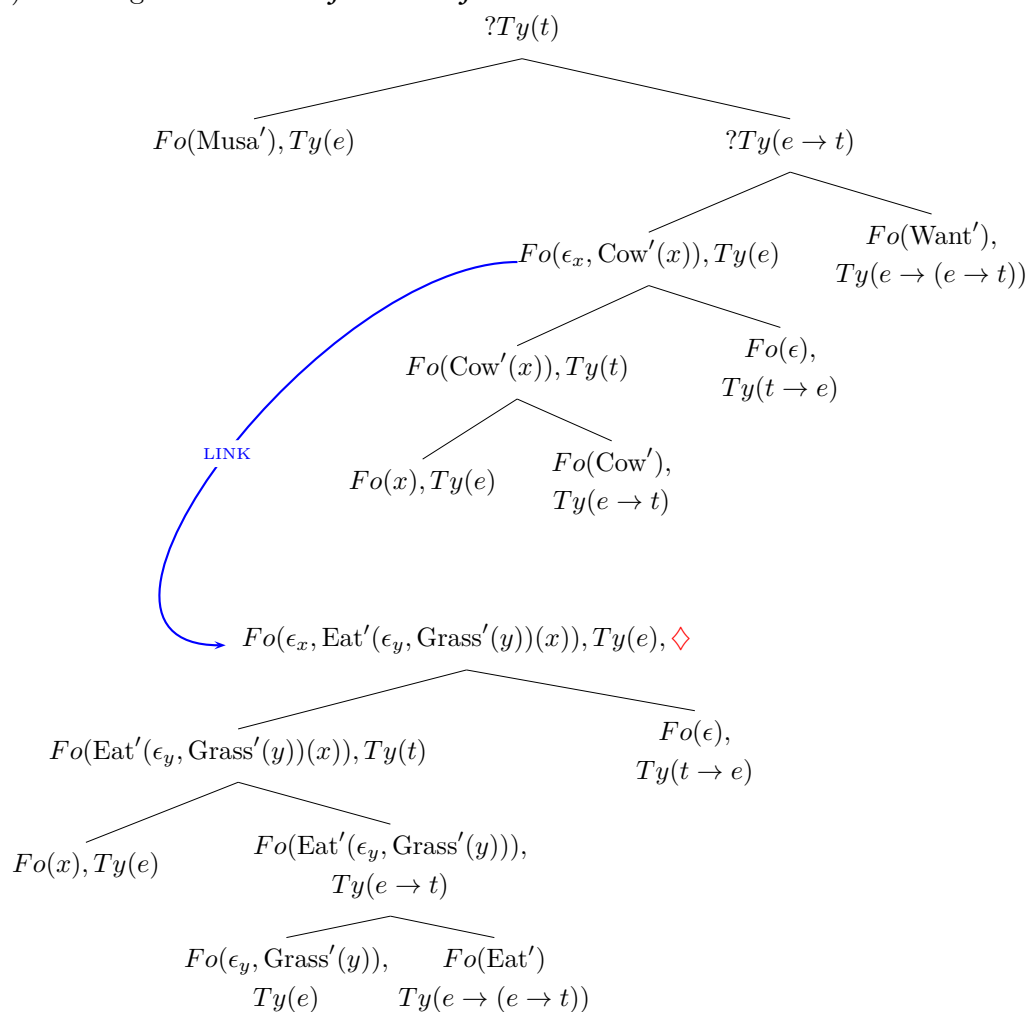
⁵An important aspect of the discussion of quantified NPs in Kempson *et al.* (2001) is the Dynamic Syntax construal of quantifier scope. This is not relevant to the current analysis, so for now I leave it aside as an unnecessary complication.

partial tree in (10.7), since all the material which has been parsed to this point has been identical.

(10.15) Parsing *musa asá:sá fijɔ m-*:



As seen in section 10.1, in the case of the demonstrative noun phrase, there is no further lexical material to be parsed at this point and the metavariable projected by the pronoun is instantiated by the substitution of an appropriate referent. In the current case however, the LINKed node may be further specified by the parsing of more lexical material: *akú ɔ:ɔ*. At this point there is an apparent problem, because the current node is of type e , but the next item to be parsed is a predicate, the verb *akú*. One way around this may be to take seriously the fact that the tree projected by an epsilon term contains an internal predicate, acting as a restrictor on the nominal variable. It seems plausible then, that the predicate projected by the relative clause decorates the predicate (restrictor) node of the the epsilon tree. This is consistent with the analysis that a relative clause in Katcha is in fact a nominal expression 'headed' by a demonstrative pronoun. Ultimately, parsing the lexical material in the relative clause will lead to a tree such as (10.16), which has a well-formed epsilon structure connected via a LINK relation to the term projected by the head noun. This structure is then ready to be evaluated using the rule of APPOSITIVE LINK EVALUATION (10.9) producing a single epsilon term with a conjoint restrictor: $\epsilon_x, (Cow'(x) \wedge Eat'(\epsilon_y, Grass'(y))(x))$

(10.16) Parsing *musa asá:sá fijɔ makú ɔ:ɔ:*

The question to be answered is how the derivation progresses from the partial tree in (10.15), where the node under development is a type e node decorated with a metavariable, to that in (10.16), where the sub-tree has been fully developed using information provided by the lexical items within the relative clause. In Kempson *et al.* (2001) a version of Dynamic Syntax is presented including two general computational rules, INTRODUCTION and PREDICTION, which license the breaking down of a goal into sub-goals that can be satisfied and the nodes then recombined to satisfy the initial goal. At first glance, some such general process might be what is needed to bring about the construction of a $?Ty(t)$ node, which would then accommodate the parsing of the lexical predicate from the relative clause. However, on consideration it is clear that these rules do not achieve the desired outcome. The current situation requires not only the abduction of structure (that is, the construction of a $?Ty(t)$ node) but also the *decoration* of nodes within the epsilon structure, namely the epsilon binder and the nominal variable. A more plausible source of this structure would come from some lexical action. It is quite common within the DS formalism that the actions associated

with the parsing of a lexical item construct a partial tree, including the decoration of (some of) its nodes. One possibility then, may be that the lexical actions projected by the demonstrative do not only decorate the $?Ty(e)$ node with a metavariable, but also construct and decorate the necessary nodes for the epsilon binder, the nominal variable and an open $?Ty(t)$ node. These actions, given in (10.17), would then construct a partial tree as shown in (10.18).

(10.17) Lexical entry for demonstrative pronoun $m\acute{o}$ (revised)

m \acute{o}	IF $?Ty(e)$ THEN $\text{put}(Fo(\mathbf{U}_{\mathbf{U} \in \mathbf{FEM}}, Ty(e), ?\exists \mathbf{x}. Fo(\mathbf{x}))$ $\text{make}(\langle \downarrow_1 \rangle), \text{go}(\langle \downarrow_1 \rangle), \text{put}(Fo(\epsilon), Ty(t \rightarrow e)),$ $\text{go}(\langle \uparrow_1 \rangle), \text{make}(\langle \downarrow_0 \rangle), \text{go}(\langle \downarrow_0 \rangle), \text{put}(?Ty(t)),$ $\text{make}(\langle \downarrow_0 \rangle), \text{go}(\langle \downarrow_0 \rangle), \text{put}(Fo(x), Ty(e))$ $\text{go}(\langle \uparrow_0 \rangle), \text{go}(\langle \uparrow_0 \rangle)$ ELSE abort
---------------	--

(10.18)

```

graph TD
    Root["Fo(U_{U in FEM}, Ty(e))"]
    Node1["?exists x. Fo(x)"]
    Node2["?Ty(t)"]
    Node3["Fo(epsilon), Ty(t -> e)"]
    Node4["Fo(x), Ty(e)"]

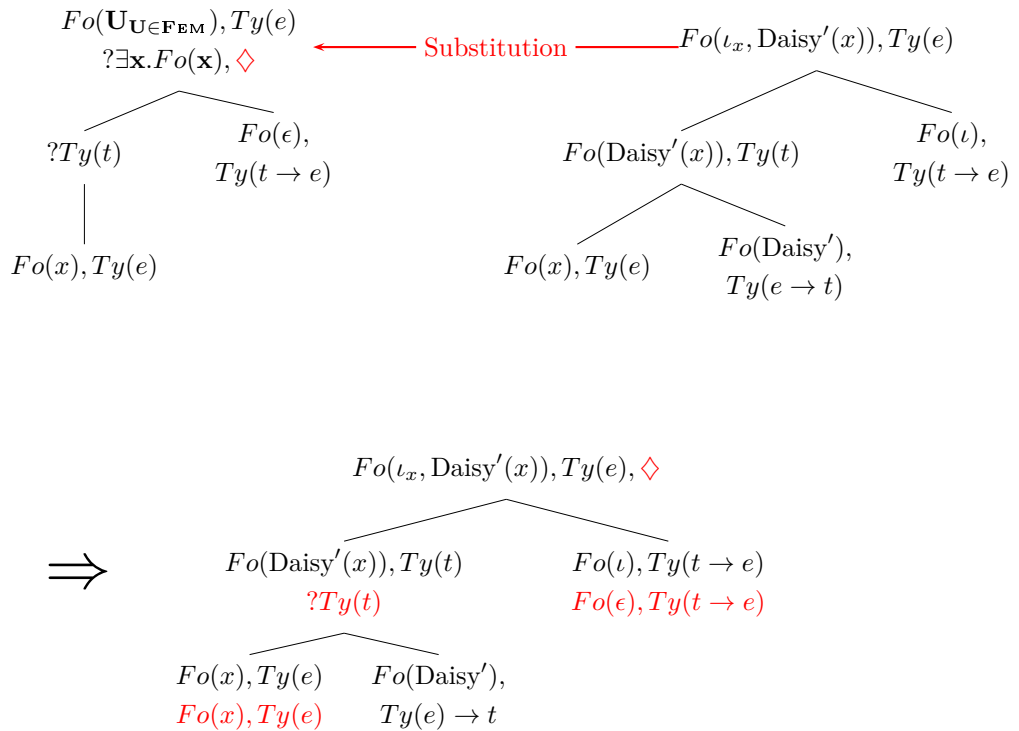
    Root --- Node1
    Root --- Node2
    Node2 --- Node4
  
```

The motivation for positing the set of lexical actions in (10.17) is primarily to create an open $?Ty(t)$ node so that a following verb may be parsed. However, there is an additional consequence of these actions which provides added motivation to this analysis: the fact that these actions include the construction of the epsilon binder is reflective of the fact that the demonstrative pronoun in Katcha is not merely an anaphoric device but also has a determiner-like function. In languages with determiners, the determiners project the epsilon binder. In Katcha, there are no lexical determiners and notions such as definiteness are supplied by the demonstrative (see below). It is therefore not unexpected that it should be the lexical actions of the demonstrative which project the epsilon binder.

If we assume this revised definition of the demonstrative (10.17) we must make an adjustment to our assumptions about the process of SUBSTITUTION. In the account of the demonstrative given above, it was assumed that the substituent, although represented as an iota term, was essentially a name. Thus in (10.8), the substituent was presented as $\iota_x, \text{Daisy}'(x)$ and treated as if it was a simple term, leaving unspecified the question of whether the term could be analysed further. The revised account of the demonstrative answers this unasked question in the affirmative.

In order to fulfill the requirements of the $?Ty(t)$ node, the partial epsilon-tree projected by the demonstrative must be updated to a fully specified epsilon-tree. This implies that the term which updates the metavariable through SUBSTITUTION brings with it a full epsilon-structure of functor and argument daughter nodes. When the root node (the epsilon term) is substituted for the metavariable, some of these daughter nodes will ‘overlay’ the existing nodes in the partial epsilon structure projected by the demonstrative. However, none of this duplication is inconsistent and consequently the nodes will collapse together harmlessly (10.19).

(10.19)

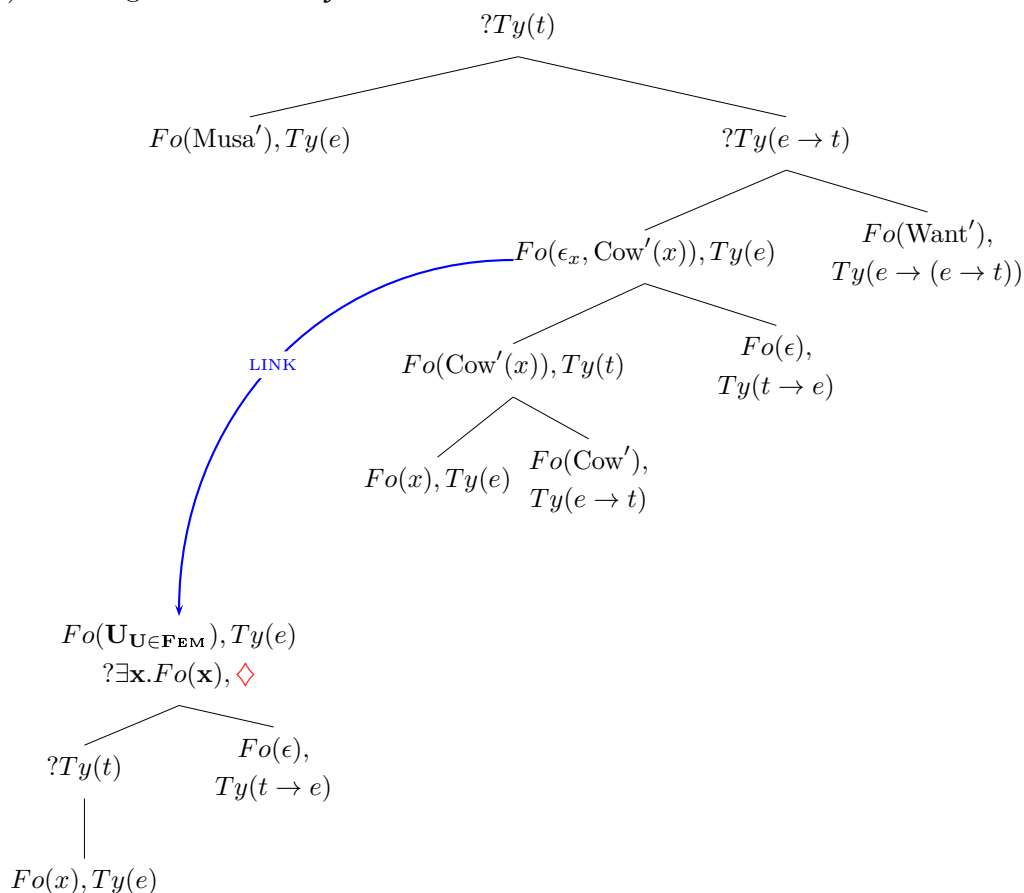


The result of this SUBSTITUTION, as shown in (10.19), is to update the partial epsilon-structure projected by the demonstrative with a fully specified epsilon-structure. The root node of the epsilon tree is updated by SUBSTITUTION in the normal way. The updates to the lower nodes are more reminiscent of the UNIFY action, in that two (partially) decorated nodes are given the same tree node address and conflated. This action is valid as long as there are no inconsistencies in the decorations on each node. In the case of the binding operator node, the ι -operator is a more specific version of the ϵ -operator, so there is no conflict here. In the case of the node decorated with the nominal variable, this unification is licit because the ‘two’ variables are by definition one and the same. (‘Daisy’ can only refer to the same individual as ‘this one’.) In the case of the intermediate node, the $?Ty(t)$ requirement is resolved satisfactorily. Finally, the restrictor is supplied in its entirety by the epsilon-term; there is no pre-existing node

to cause any inconsistency.⁶

Assuming that the approach sketched above can be formalised within the DS system, we now have a way of incorporating relative clauses into the account of demonstratives. After parsing the demonstrative pronoun using the revised version of the lexical actions (10.17), the tree is as shown in (10.15'), with the pointer at the node decorated by the metavariable.

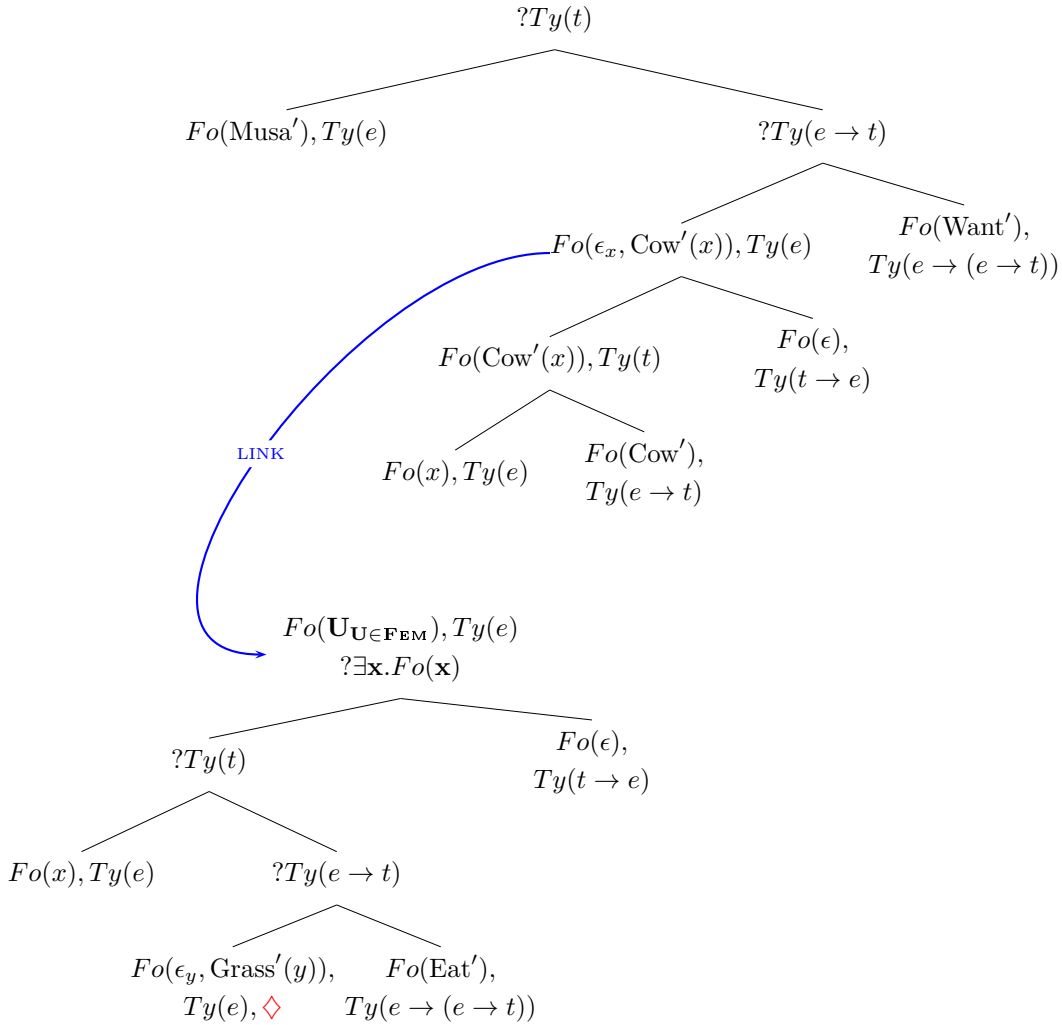
(10.15') Parsing *musa asá:sá fiɔ m-*:



In the case of the demonstrative pronoun, there is no further lexical material to be parsed and (the revised version of) SUBSTITUTION (10.19) applies to instantiate the metavariable with an appropriate referent and complete the LINKed epsilon-tree. In the case of a relative clause however, SUBSTITUTION does not apply and the LINKed tree is completed by processing additional lexical items.

⁶This final point, that the updating process includes the construction of the restrictor node, is notable. The process described here is not merely one of SUBSTITUTION of a Formula value as defined in Cann *et al.* (2005:72), but involves the abduction of structure. Formalising this process will require to be done carefully, to ensure there is an appropriate trigger for the construction of structure, and that monotonicity is retained; it is not clear that a free pragmatic process like substitution should be allowed to build structure in an unconstrained manner. I leave this formality to one side for the present.

In (10.15'), the pointer is at the root node of the LINKed partial tree. However, there is an outstanding $?Ty(t)$ requirement at its argument daughter which must be fulfilled. As noted above, one way of fulfilling this requirement is by SUBSTITUTION of the metavariable with an epsilon-term and abduction of the necessary structure from that. However, all rules in DS are optional and in the case of the relative clause SUBSTITUTION does not apply; the pointer is therefore compelled to move to the node with the unfulfilled requirement. With the pointer now at the $?Ty(t)$ node, the verb of the relative clause can be parsed in the usual way, followed by the object noun. It is instructive to note that in a subject relative clause, the verb does not carry the subject agreement marker which is obligatory in other finite environments. This is reflected in the analysis given here, where the subject node has already been decorated by the demonstrative pronoun. A full DS analysis of Katcha verbs falls outwith the scope of the current study, but it is plausible to suppose that the obligatory subject agreement marker in a finite clause may be an 'incorporated pronoun' which decorates the logical subject node and that the verb projects the predicate and (where appropriate) object nodes. In the case of a relative clause an alternative pronoun, the demonstrative, decorates the subject node. Parsing the verb and object of the relative clause then gives the tree in (10.20).

(10.20) Parsing *musa asá:sá fiʒ makú ɔ:ʒ*:

The epsilon-tree can now be compiled in the usual way, fulfilling the requirements on the intermediate nodes and providing a complete epsilon term to instantiate the meta-variable and fulfil the requirement for a Formula value on the root node. This brings about the tree in (10.16), which can be evaluated using the rule of APPOSITIVE LINK EVALUATION (10.9) to produce a single epsilon term with a conjoint restrictor $(\epsilon_x, (\text{Cow}'(x) \wedge \text{Eat}'(\epsilon_y, \text{Grass}'(y))(x)))$ as the logical object of the matrix proposition.

The analysis outlined here ultimately gives a result which models the Katcha data very well. There are three salient features of demonstratives in Katcha which were presented in chapter 5: firstly, demonstratives are pronouns; secondly, they are appositional to the modified noun; thirdly, they ascribe definiteness to the noun phrase, there being no separate lexical category of determiners. The lexical actions for the demonstrative proposed here project three nodes which are reflective of these three respective features: a metavariable, a nominal variable identical to that of the modified noun, and an epsilon binding operator. When these lexical actions interact

with standard Dynamic Syntax rules such as LINK APPPOSITION and standard epsilon calculus semantics, the expected interpretation of subject relative clauses falls out quite naturally.

It should be noted that this account of subject relatives leads obligatorily to the relativised noun phrase having an indefinite interpretation. This might seem surprising since the relativising particle is the demonstrative pronoun, which is usually associated with a definite interpretation; somewhere along the way it appears that the demonstrative has lost its ability to ascribe definiteness to the noun it modifies. The explanation of this puzzle is in the incremental nature of Dynamic Syntax. DS characterises pronouns as underspecified metavariables which are subsequently updated. The definiteness of a pronoun does *not* come from the pronoun itself, but from the term which later instantiates the metavariable. The fact that there is a unique, identifiable referent for a noun phrase is a matter of pragmatics, not lexicon. As a case in point, so-called definite determiners like *the* in English are frequently used in non-definite contexts, such as generic expressions.

In the case of a Katcha demonstrative noun phrase like *fijɔ mɔ́*, ‘this cow’, in (10.1), the demonstrative pronoun does ascribe definiteness to the phrase. This is because the metavariable is resolved by SUBSTITUTION and the context will supply a definite, identifiable referent. The demonstrative pronoun, by its anaphoric nature, provides an opening for a definite referent for the noun phrase; the ϵ -operator projected by the demonstrative is supplemented by the ι -operator provided by the substituend. The demonstrative pronoun thereby causes the noun phrase to be definite. In the case of a relative clause, the metavariable is not resolved by SUBSTITUTION, but instead is resolved when the tree is compiled following the parsing of the verb (and any complements). There is no opportunity for any further update to the binding operator and consequently that node remains decorated with an ϵ -binder and the noun phrase remains indefinite.

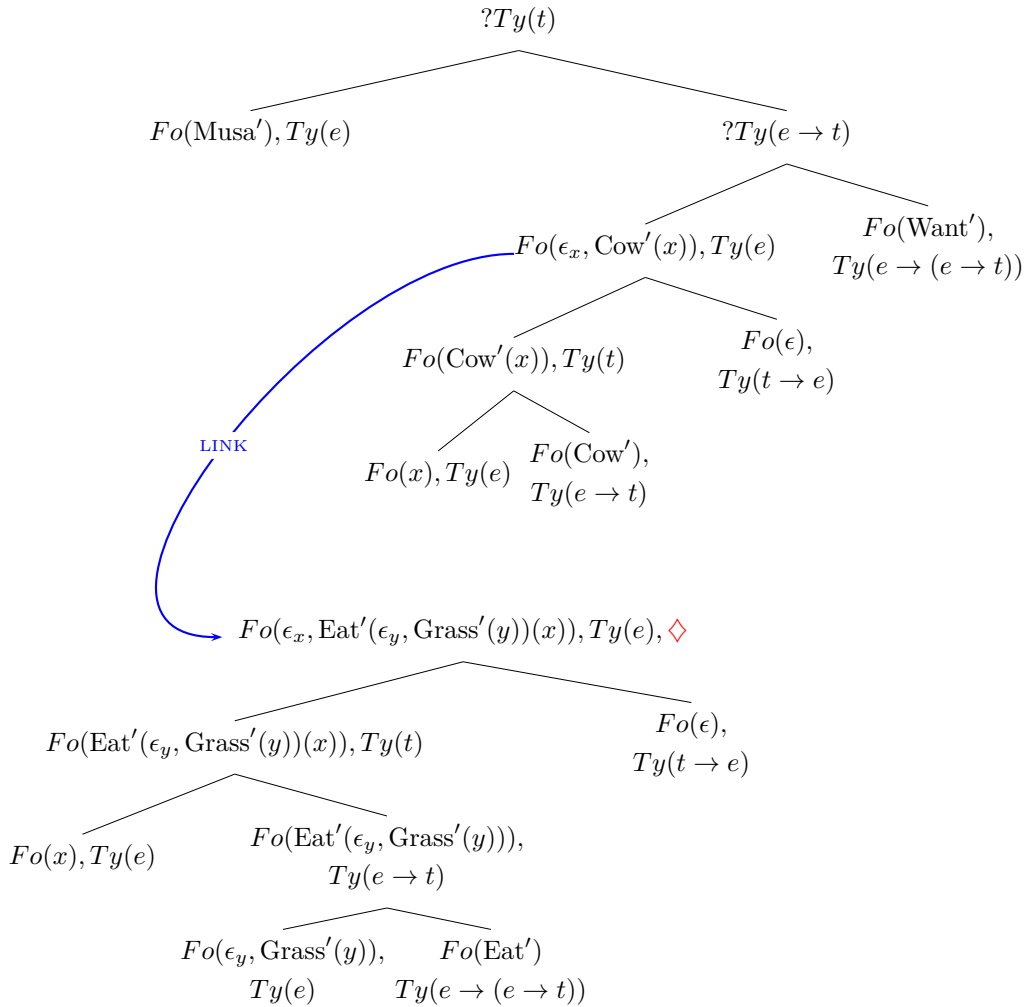
The prediction that relativised nouns in Katcha can only be indefinite has a nice consequence, in that it explains the second instance of the demonstrative pronoun at the end of the relative clause. In my data, this clause-final pronoun is present quite consistently but previous researchers have not found this to be the case. Gilley (2013:502) suggests that it is obligatory for masculine, optional for feminine and absent for plural nouns, though she does not attempt to give any further analysis. Stevenson (1956-57:61,63), however, finds that the clause-final demonstrative is optional and states that its purpose is to mark definiteness. The analysis given here predicts Stevenson’s data to be correct.⁷

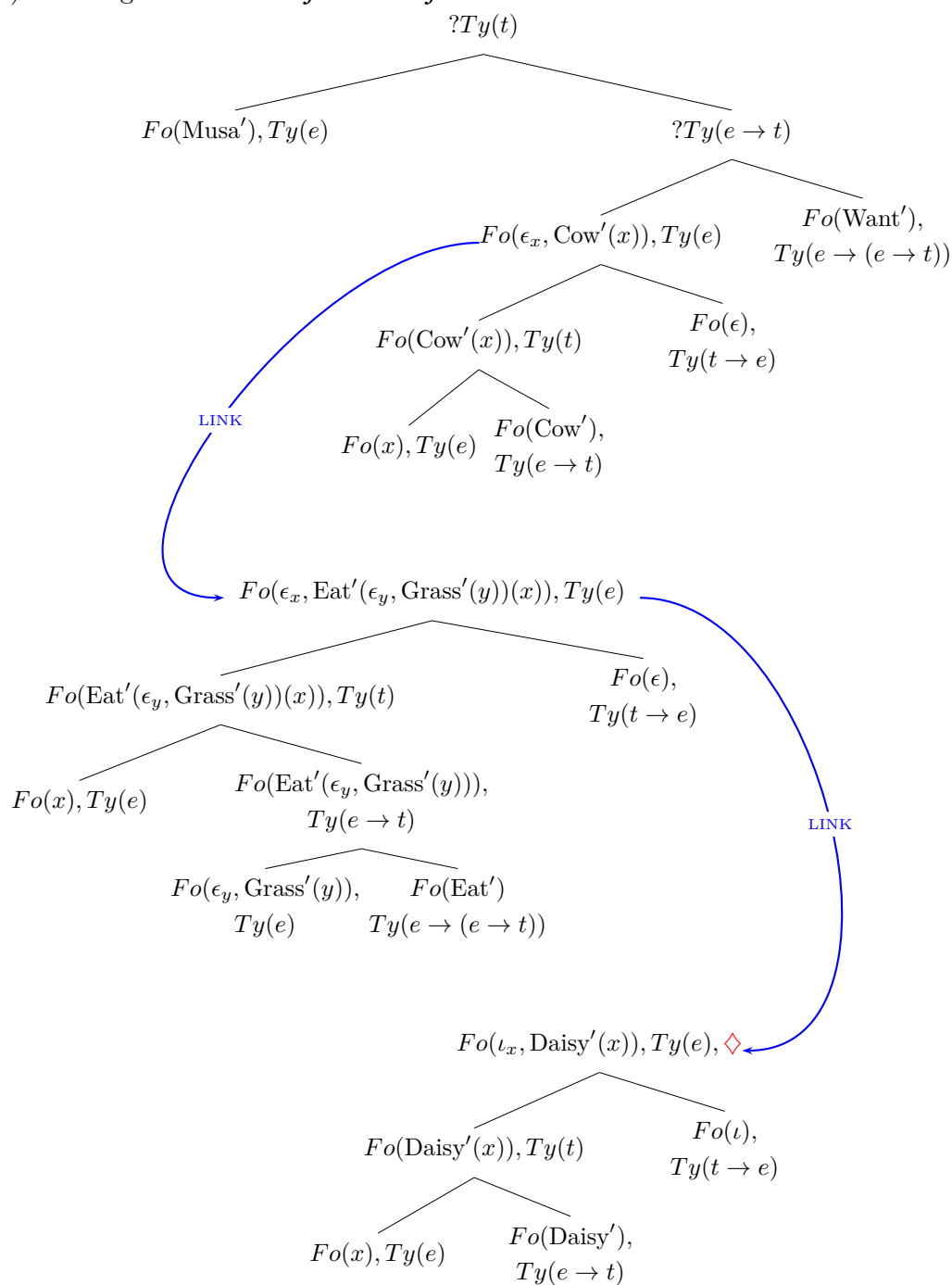
Assuming that the clause-final demonstrative is there to make the noun phrase

⁷I generally find Stevenson’s descriptions to be quite accurate, so this should come as no major surprise.

definite, the final step in parsing sentence (10.14) is to incorporate the demonstrative. Starting from the point in the parse when all words except for the final demonstrative have been parsed (10.16, repeated below) the steps required to process the demonstrative are carried out. Naturally, these are the same steps described above: APPOSITIVE LINK INTRODUCTION, decoration of the LINKed node with a metavariable and partial epsilon-tree, and SUBSTITUTION of the metavariable and update of the ϵ -tree by an appropriate referent. These steps lead to the tree shown in (10.21).

(10.16) Parsing *musa asá:sá fiḵ makú ɔ:ḵ*:



(10.21) Parsing *musa asá:sá fiʒ makú ɔ:ʒ mós*:

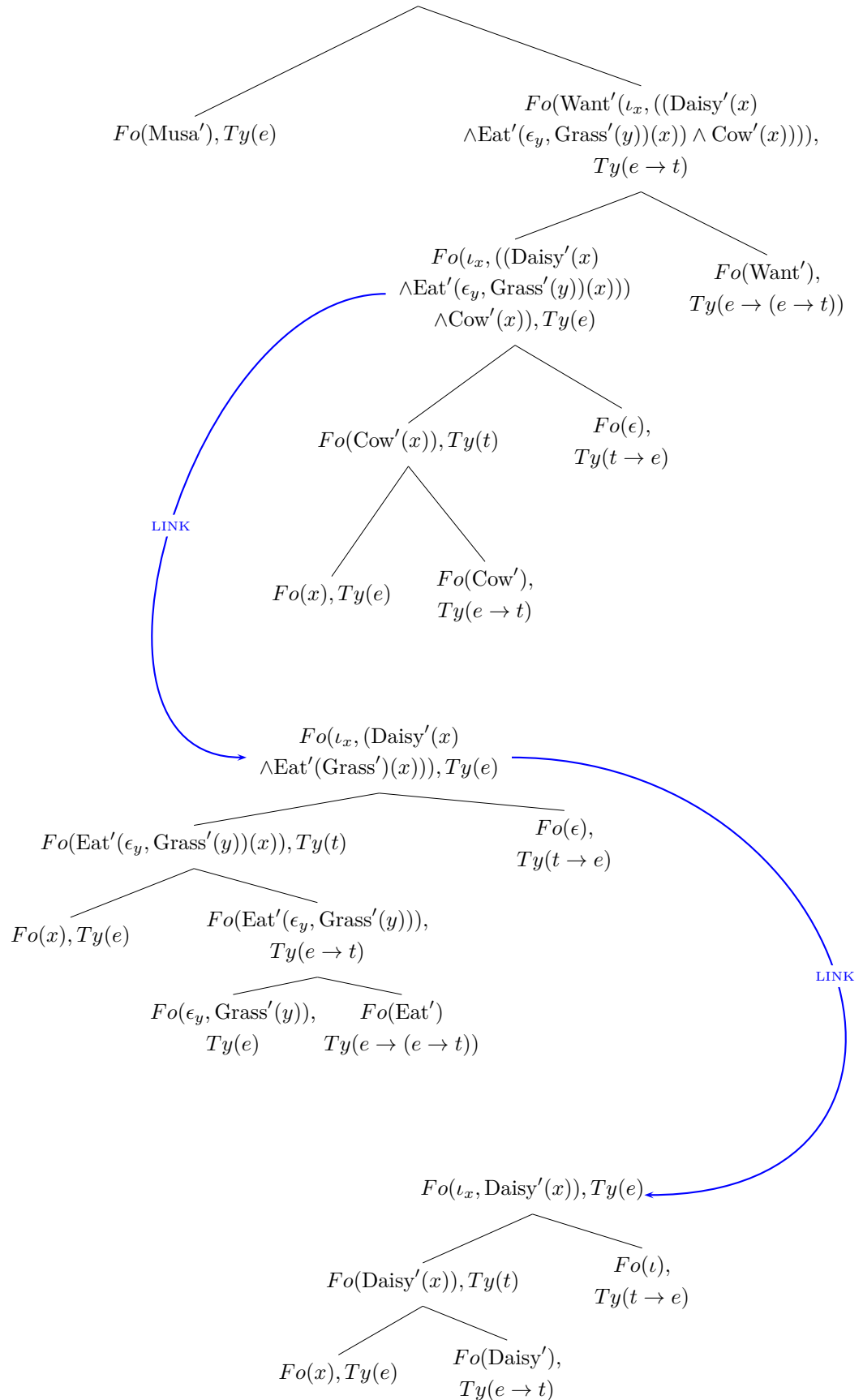
Successive applications of APPOSITIVE LINK EVALUATION (10.9) then give the interpretation for the complex noun phrase. These are followed by the usual steps of COMPLETION and ELIMINATION to decorate the root node of the main tree with the propositional formula expressed by the utterance as a whole. This is the formula given in (10.22) which states that Musa wants a unique individual x , which is identified by

the name Daisy, eats grass and is a cow. The final tree is shown in (10.23).

$$(10.22) \quad Fo(\text{Want}'(\iota_x, ((\text{Daisy}'(x) \wedge \text{Eat}'(\text{Grass}'(x)) \wedge \text{Cow}'(x))))(\text{Musa}'))$$

(10.23) Final tree for *musa asá:sá fiyo makú ɔ:jo mɔ:*

$Fo(\text{Want}'(\iota_x, ((\text{Daisy}'(x) \wedge \text{Eat}'(\epsilon_y, \text{Grass}'(y))(x)) \wedge \text{Cow}'(x)))(\text{Musa}'), Ty(t), \diamond$

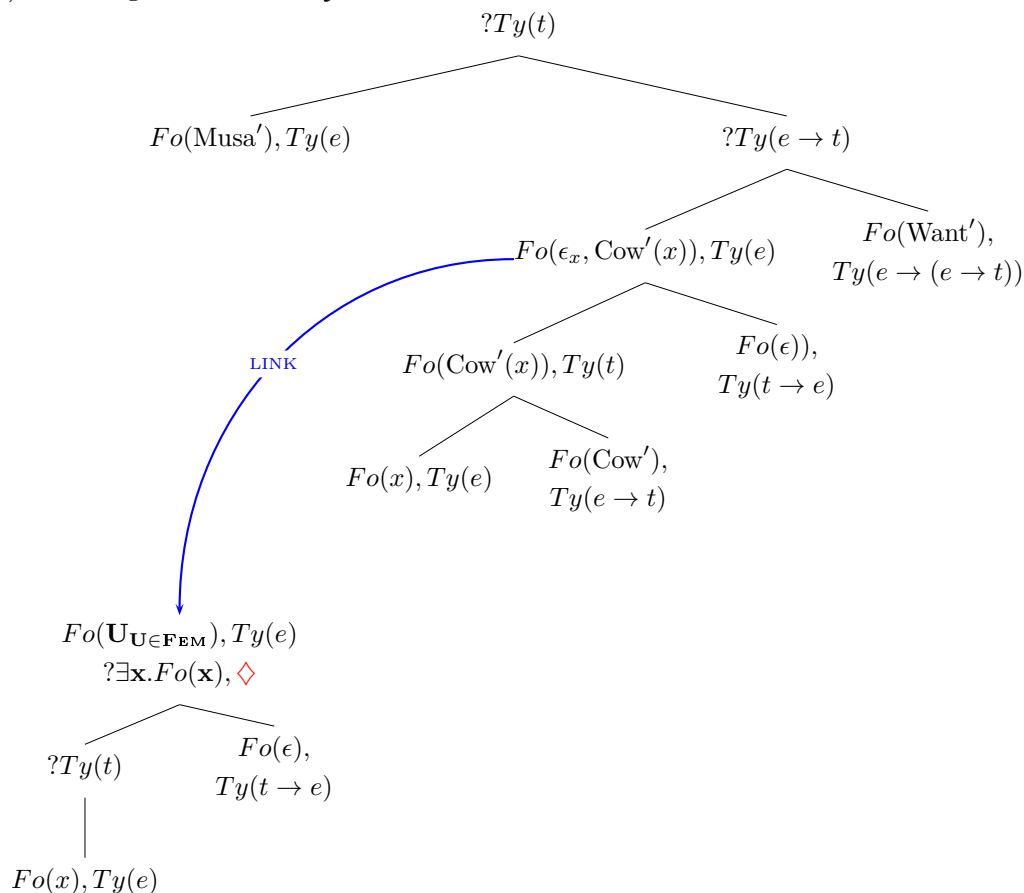


10.3 Possessive NPs

- (10.24) Musa asá:sá fíjə má kúkkû
 Musa 3SG.want cow PROX.F Kuku
 ‘Musa wants Kuku’s cow’

Kempson *et al.* (2001:144-148) suggest an analysis of genitive constructions within Dynamic Syntax as LINK structures, essentially treating them as a form of relative. In the analysis given there, it is assumed that the genitive projects a LINKed proposition with a 2-place predicate whose value is constructed from some contextually provided value (represented in Kempson *et al.* (2001) as *POSS*). This approach is well suited to the Katcha data, where relative clauses and possessive constructions are introduced by the same morpheme. The account of the Katcha demonstrative pronoun laid out in section 10.2 provides a natural starting point for an analysis of possessive noun phrases. Nominal modifiers are analysed as projecting an epsilon structure connected by a LINK relation to the term projected by the modified noun. The details of this LINKed epsilon structure are partially projected by the demonstrative pronoun such that after parsing the demonstrative the tree is as given in (10.15'), repeated here as (10.25).

- (10.25) Parsing *musa asá:sá fíjə má*:



The LINKed partial epsilon tree then requires to be further developed. In the case of the demonstrative this update comes from context; in the case of the relative clause it comes from parsing the immediately following predicate, which can be done straightforwardly since the trigger for parsing a predicate is an open $?Ty(t)$ node. However, in the case of a possessive noun phrase, such as that given in (10.24), the demonstrative pronoun is followed by a noun phrase referring to the possessor. At first glance, this would appear to be problematic: other than the node decorated by a metavariable, the only node available to be developed is the open $?Ty(t)$ node. This is the usual context for parsing a predicate, but there are no predicates to be parsed within the modifier.

A solution to this apparent problem is to assume with Kempson *et al.* (2001) that possession is a relation between two individuals and that as such, it entails some contextually defined predicate. In Kempson *et al.* (2001)'s account of the English genitive, this predicate is projected by the genitive case-marker 's. In Katcha, there is no morpheme marking possession because the 'possessive' marker is in fact the demonstrative pronoun. The possessive predicate cannot therefore be projected by this morpheme. Instead, the modifying noun is known to be a possessor because it appears in a particular context, namely, immediately following the demonstrative. In other words, possession in Katcha is not marked morphologically, but by syntactic position.

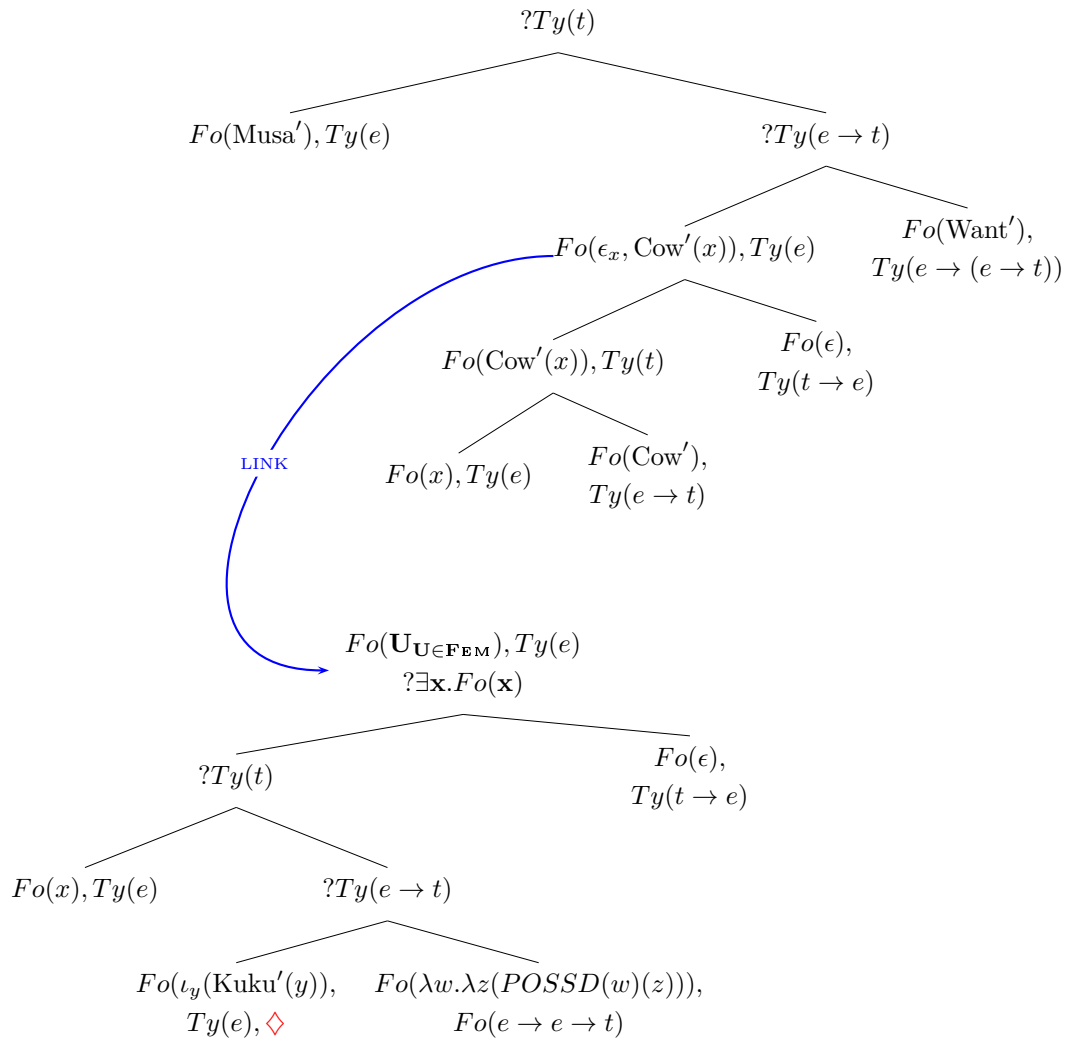
Formalising this construction is then a case of formalising the observation that when a noun occurs in the correct syntactic context — following a demonstrative pronoun — it has a possessive interpretation. This can easily be done by giving nouns a disjunctive lexical entry, one of the disjuncts being actions to construct a predicate of possession given the appropriate trigger. It is then simply a matter of defining this trigger formally. (10.26) gives one possible formulation of the lexical entry for the name Kuku. The first disjunct is a standard set of lexical actions for parsing a noun in an ordinary argument context. The second disjunct is the one relevant to the current discussion. This states that in the correct context (to be discussed below), an argument node is constructed and decorated with the semantic content usually associated with the noun, but that, in addition, a predicate node is constructed and decorated with a possession relation. Ultimately this predicate will express the relationship between the referent of the noun and the variable previously projected by the demonstrative.

(10.26)	Lexical entry for <i>kókkô</i>
kókkô	<pre> IF ?Ty(e) THEN make(⟨↓₁⟩), go(⟨↓₁⟩), put(Fo(λp(ι_x, p)), Ty(t → e)), go(⟨↑₁⟩), make(⟨↓₀⟩), go(⟨↓₀⟩), put(?Ty(t)), make(⟨↓₁⟩), go(⟨↓₁⟩), put(Fo(ι_x, Kuku'(x)), Ty(e → t)), go(⟨↑₁⟩), make(⟨↓₀⟩), go(⟨↓₀⟩), put(Fo(x), Ty(e)) IF ?Ty(t), ⟨↑₀⟩Ty(e) THEN make(⟨↓₁⟩), go(⟨↓₁⟩), put(?Ty(e → t)), make(⟨↓₁⟩), go(⟨↓₁⟩), put(Fo(λw.λz(POSSD(w)(z))), Ty(e → e → t)), go(⟨↑₁⟩), make(⟨↓₀⟩), go(⟨↓₀⟩), put(?Ty(e)) ELSE make(⟨↓₁⟩), go(⟨↓₁⟩), put(Fo(λp(ι_y, p)), Ty(t → e)), go(⟨↑₁⟩), make(⟨↓₀⟩), go(⟨↓₀⟩), put(?Ty(t)), make(⟨↓₁⟩), go(⟨↓₁⟩), put(Fo(ι_x, Kuku'(x)), Ty(e → t)), go(⟨↑₁⟩), make(⟨↓₀⟩), go(⟨↓₀⟩), put(Fo(y), Ty(e)) ELSE abort </pre>

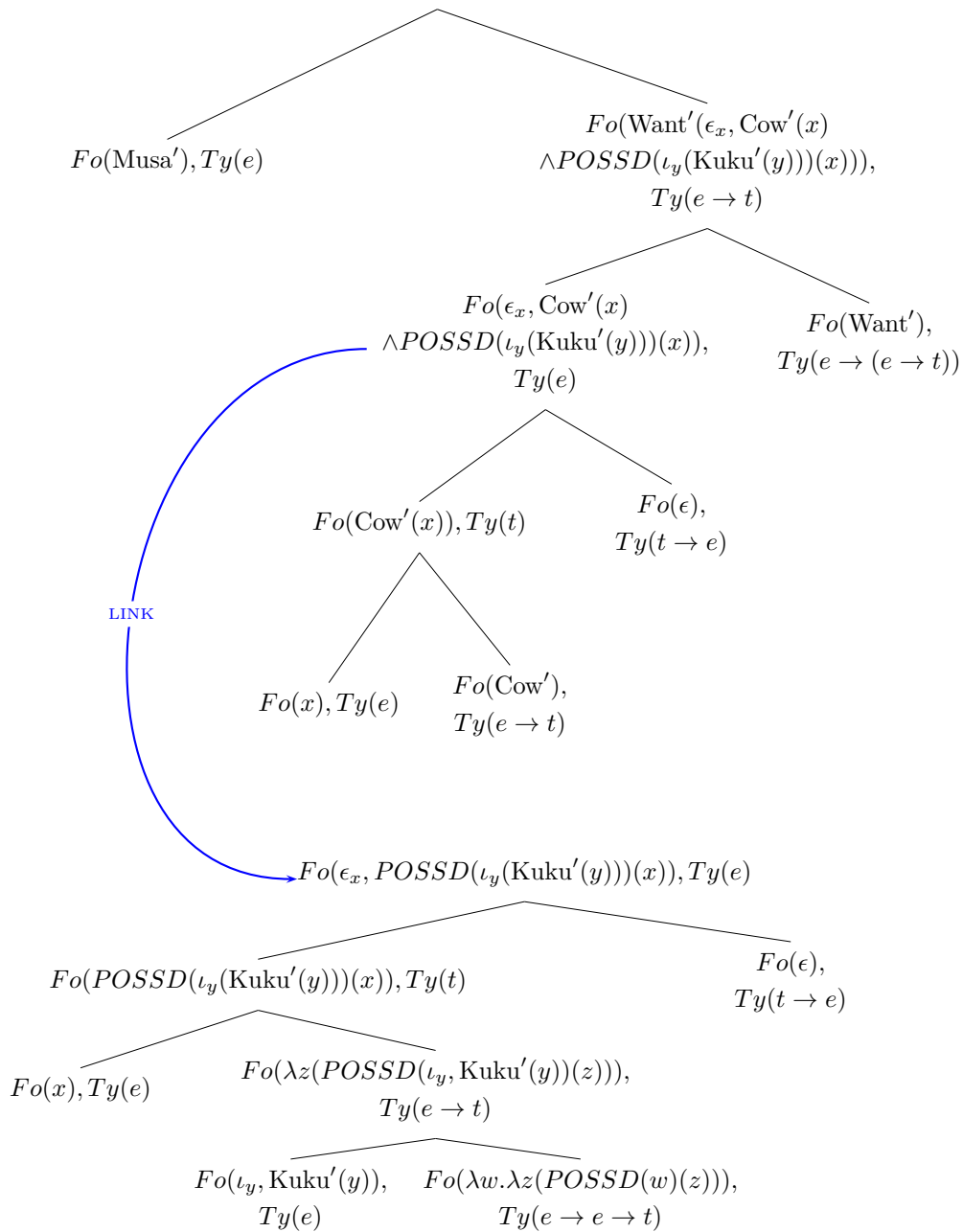
The exact nature of the trigger for the second disjunct may need to be refined. It requires to be specific enough that a noun will only be interpreted as a possessor in the appropriate context. Clearly, $?Ty(t)$ would not be sufficiently specific to the context and would overgenerate. It may be that the context described in (10.26) is still too general and requires to be adjusted, perhaps by making reference to the LINK relation. However, the exact formulation of the trigger does not affect the overall analysis. The important thing is that in the correct context, following the parsing of a demonstrative pronoun as part of a nominal modifier, the lexical actions of a noun indicate its interpretation as possessor by constructing the appropriate predicate. For now I assume that $?Ty(t), \langle \uparrow_0 \rangle Ty(e)$ is a sufficient description of the context in which these actions are executed. This context reflects the fact that the demonstrative pronoun has already been parsed and has decorated the root node of the LINKed epsilon-tree with a type e metavariable.

The lexical actions defined in (10.26) make the parsing of sentence (10.24) quite straightforward. After the demonstrative has been parsed, the partial semantic tree is as in (10.25). As was the case for relative clauses, the pointer will move down the tree to develop the open $?Ty(t)$ node. The noun may now be parsed with the context ensuring that the possessive set of actions are executed, leading to the tree in (10.27).

(10.27) Parsing *musa asá:sá fijo má kúkkô*:



With all the lexical items parsed, the tree is now compiled and evaluated in just the same way as for a relative clause, giving the final tree in (10.28). As before, the rule of APPOSITIVE LINK EVALUATION gives a formula value at the logical object node which is a single epsilon term with a conjoint restrictor, $\epsilon_x, Cow'(x) \wedge POSSD(\iota_y(Kuku'(y)))(x)$, referring to some arbitrary individual which is a cow and is possessed by Kuku.

(10.28) Final tree for *musa asá:sá fíjɔ má kúkú:* $Fo(\text{Want}'(\epsilon_x, \text{Cow}'(x) \wedge \text{POSSD}(\iota_y(\text{Kuku}'(y)))(x))(\text{Musa}'), Ty(t), \diamond$ 

It is worth considering briefly the nature of the ‘possession predicate’. Kempson *et al.* (2001) describe it as a semantically relatively weak predicate, a ‘relation whose value is constructed from some contextually provided value’ (Kempson *et al.* 2001:145). The case they consider is the English genitive and so they consider the predicate to be a binary relation with the possessor as its logical subject and the possessee as its logical object. For simplicity, they represent the predicate as *POSS*. In the Katcha case, the logical subject of this possession relation is the variable representing the possessee which

is projected by the demonstrative pronoun. The relation is therefore the inverse of that suggested by Kempson *et al.* (2001), and for convenience is written here as *POSSD* to make the difference explicit. (It can be thought of as ‘ x is possessed by y ’.) At first this seems like a slightly clumsy approach — hypothesising an implicit predicate which may be construed one way in one language but exactly inversely in another — but there are two points to be made in its defence. One is that if the value of the predicate is contextually provided, it might well be expected to vary from language to language. The second point is that this difference is not unmotivated, but in fact reflects the morphology of the two languages rather neatly. English possessives are constructed using a dependent-marking strategy, that is, with morphological marking (‘genitive case’) on the modifying noun (the possessor). Contrastingly, Katcha possessives are head-marking⁸ and are expressed using something much closer to a construct state, as was noted in section 5.5.2. The Katcha ‘possessive marker’, i.e. the demonstrative pronoun, does not morphologically mark the head noun (the possessee), but it is associated with it by agreement and anaphorically. So the apparent difference between the two languages in the semantics of the possession predicate may in fact be exactly what we should expect to see, given their contrasting marking strategies for possessives. If so, far from being clumsy, this is a very nice result. The analysis of the demonstrative pronoun given in section 10.2 is that it shares an argument variable with the noun it modifies. This analysis was motivated by the need to account for relative clauses. But a side effect of that analysis is that in the case of possessives the logical subject of the possession predicate must be the shared variable, forcing the possession predicate to be *POSSD* rather than *POSS*. This directly reflects the morphology of possessive constructions, because Katcha uses (something close to) a head-marking construct strategy rather than a dependant-marking genitive strategy.⁹

⁸Or at least, ‘head-aligned’, through agreement relations.

⁹Although positing two alternative possession predicates reflects the morphology of possessive constructions quite neatly, it is not obvious that such a distinction should exist in the semantics. Assuming that the genitive construction in English and the possessive construction in Katcha express the same semantic relation, it should perhaps be expected that there would be only one ‘*POSS*-type’ relation. If so, the analysis given here forces this predicate to be expressed as the Katcha version with the head, the possessee, as the external argument, rather than the inverse. Kempson *et al.* (2001) make no strong claims for their assumed *POSS* relation, describing it only as a relation whose value is contextually provided, holding between the possessor and the possessee. Likewise, I do not wish to make any strong claims about this predicate other than to suggest that if there is indeed only one such relation, it is better to think of it as a property of the head noun, i.e. some relation holding between the head noun and some modifier.

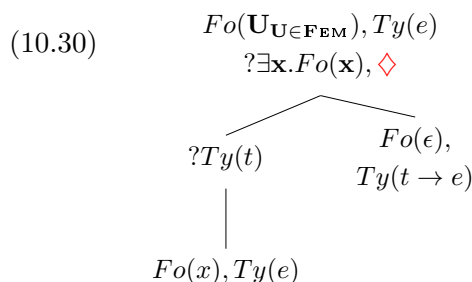
10.4 Non-subject Relative Clauses

(10.29) kə:kóʀó [má kúkkû ka ící ʒ:kó mó] m-əʃó mereké
 hen REL.F Kuku DCM see 3F REL.F 3F-peck sesame
 ‘The hen which Kuku sees is eating sesame’

Non-subject relatives are formed in the same way as subject relatives, the subordinate clause being introduced by a demonstrative pronoun and also being concluded with one (probably to mark definiteness). However, the internal structure of the relative clause is different – a non-finite verb is used, being marked with a dependent clause marker (and sometimes an infinitive). A resumptive pronoun marking the relativised element is also common; this does not occur in the case of subject relatives.

A fully worked-out analysis of the internal structure of non-subject relative clauses will be dependent on an analysis of the dependent clause marker *ka* and the discourse properties of non-finite clauses, which is outwith the scope of the current study. However, it is possible to note a few points about how non-subject relative clauses may fit into the overall account of nominal modifiers.

On the basis of the analysis presented so far, it is obvious why non-subject positions cannot be relativised. The lexical actions of the demonstrative pronoun, as defined in (10.17), construct the partial epsilon tree in (10.18), repeated here as (10.30).



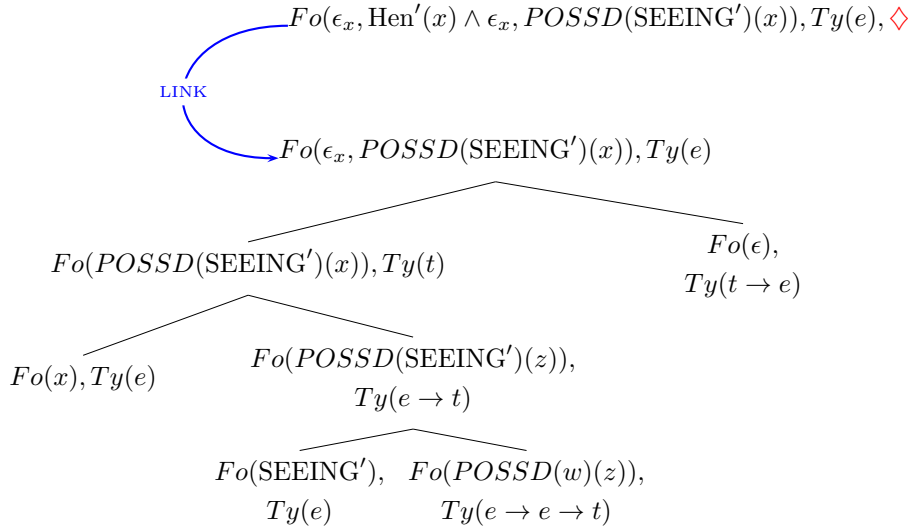
Crucially, whilst these actions leave the restrictor node unspecified, they include the decoration of the internal *Ty(e)* node with a nominal variable. In the case of a relative clause, this allows any verb to construct and decorate the restrictor node freely. However, the value of the logical subject is already fixed, it is necessarily identified with the head noun. Thus a verb can only decorate the restrictor node directly when its subject is identified with the modified noun; only subjects can be relativised directly. In this, Katcha obeys the generalisations of Keenan and Comrie’s (1977) Accessibility Hierarchy, which states that subjects are more easily accessible to relativisation than other NP positions, that positions on the hierarchy lower than subject may require to be relativised using constructions other than the language’s ‘primary Relative Clause-forming strategy’, and that the alternative strategies are more likely to include the use of resumptive pronouns. Interestingly, while Keenan and Comrie (1977) suggest a

psychological motivation for the hierarchy, the analysis of demonstratives given here predicts (at least some aspects of) this observation from a formal, syntactic perspective.

As noted above, the final analysis of non-subject relatives is likely to rest on the analysis of the dependent clause marker, *ka*. Furthermore, any such analysis will have to take into consideration the fact that the verb of the relative clause cannot decorate the predicate/restrictor node directly. One possible approach is hinted at by the connection between relative clauses and possessive noun phrases, mentioned in section 10.3. It was noted there that possessives may be considered a type of relative, but the inverse may also be considered to be true. Indeed, the morphological similarity between the Katcha possessive construction and the non-subject relative construction is quite noticeable, to the extent that Stevenson (1956-57:64) states that for the non-subject relative, ‘a genitive construction (with genitive particle or possessive pronoun) is used’. It was suggested in chapter 5 that given the non-finite nature of non-subject relatives, and given their appositional nature, an appropriate paraphrase of the noun phrase in sentences such as (10.29) is to use constructions along the lines of ‘the hen of Kuku’s seeing her.’ This is a reasonable position to adopt reflecting as it does the morphological link between the ‘possessive particle’ and the ‘relativiser’, as well as reflecting the non-finite nature of the verb.

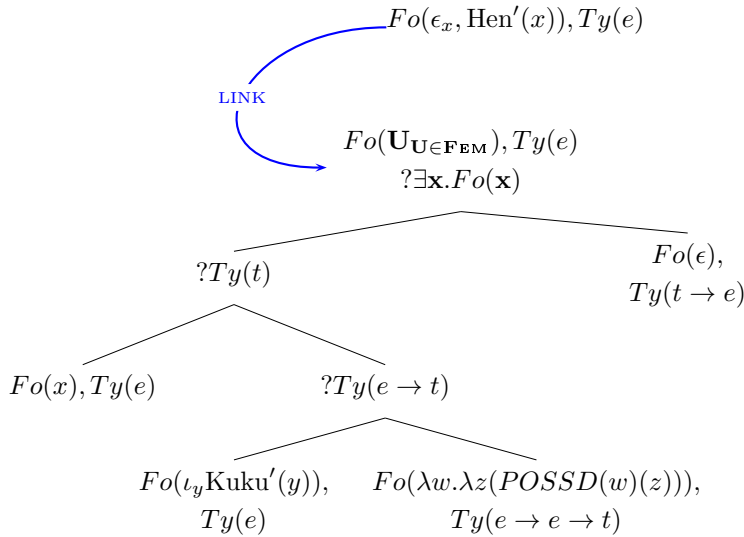
One possible strategy for the analysis of non-subject relatives, then, might be to see the non-finite clause as a nominalisation. The entire clause would then provide an argument for the predicate represented in section 10.3 as *POSSD*. If the predicate is merely a ‘relation whose value is constructed from some contextually provided value’ (Kempson *et al.* 2001:145), it may be too restrictive to think of it as possession. In that case, there is no reason why the relation should not hold between the referent of the head noun and some more abstract entity, such as an event of seeing. Such an approach would lead to a final epsilon-structure along the lines of that sketched in (10.31), where the internal structure of ϵ_x , $\text{Hen}'(x)$ is suppressed, SEEING' is shorthand for some event of Kuku seeing some object, and *POSSD* is the relation that holds between this event and x .

(10.31) Modified noun phrase *ka:kóró má kúkkô ka ícǐ ́kǒ* (A hen which Kuku sees)



If this is the correct approach to the non-subject relative construction, parsing (10.29) would entail parsing the head noun, constructing a LINK from it to a $?Ty(e)$ node and parsing the demonstrative pronoun in the usual way. Since the next lexical item to be parsed is the proper noun *Kuku* the possessive set of lexical actions (the second disjunct from the lexical entry in (10.26)) will be executed, constructing the ‘possessive’ predicate as well as the iota-structure as its object. Thus far the process is exactly as for possessives, leading to the partial tree in (10.32).

(10.32) Parsing *ɔ:kóró má kúkkô*:



At this point in the parse the dependent clause marker *ka* is parsed and presumably indicates that the term currently under development does not make up the entirety of the logical object, but is part of a larger entity. How the process unfolds to produce a term representing ‘the event of Kuku seeing it’ is a matter of the internal structure

of the relative clause so I leave it aside for the present, pending an analysis of clauses with *ka*. For now it is sufficient to see how straightforwardly non-subject relatives may be integrated into the overall analysis of nominal modifiers.¹⁰

10.5 Conclusion

The analysis of Katcha nominal modifiers proposed in chapter 5 is that they are uniformly ‘headed’ by demonstrative pronouns appositional to the noun phrase. This is modelled in the Dynamic Syntax framework using a general computational rule of APPOSITIVE LINK INTRODUCTION (10.4). This rule constructs a LINK relation between two type *e* nodes which are decorated by epsilon terms projected by two noun phrases, namely the modified NP (a lexical noun) and the modifier ‘headed’ by a demonstrative pronoun. The corresponding evaluation rule (10.9) merges the two into a single epsilon term with a conjoined restrictor. Thus the properties projected by two noun phrases in apposition can only be interpreted as holding of a single individual.

The analysis of demonstrative pronouns presented here extends the actions associated with them to include the construction of more semantic structure than is standard in Dynamic Syntax. Pronouns are seen not only to be placeholders but also to build partial epsilon structures. Specifically, they project an argument variable and an epsilon binder, but no restrictor. The restrictor may be provided by substitution of a referent from context, in which case the demonstrative has a definite, pronominal interpretation (section 10.1). Alternatively, it may be provided by a verb, in which case the demonstrative essentially acts as a relative pronoun (section 10.2). Another possibility is that the restrictor’s value is constructed from some contextually provided value expressing some relationship, such as possession, between the argument variable and some other term (section 10.3). These possibilities directly model the analysis of chapter 5 where it was argued that the interpretation of a demonstrative pronoun is dependent on what follows in the rest of the modifier phrase.

The fact that the demonstrative pronoun projects an internal argument node and decorates it with a variable restricts how the metavariable can be updated by substitution and means that the analysis predicts certain correlations which do not necessarily seem to be related at first. For example, the analysis predicts correctly that only subjects can be relativised directly. Similarly, the predicate of possession is forced to have as its logical subject the possessee rather than the possessor, which reflects the

¹⁰An alternative approach would be to assume that the relative clause provides context to enrich some semantically weak predicate (possibly a metavariable) which holds of the head noun. In this case the dependent clause marker presumably marks the fact that the verb does not predicate over the nominal variable but has some other relation to it. Again, a full analysis will need to wait until the DCM has been studied more carefully. If this were the correct analysis, it would be likely to have implications for the present account of the semantically weak predicate *POSSD*.

fact that the demonstrative pronoun agrees with the gender of the possessee and not the possessor.

Key to this analysis is the strong distinction between pronouns and lexical nouns. The construal of pronouns as underspecified forms — metavariables which act as a placeholder to be updated by additional linguistic or non-linguistic information — contrasts with lexical nouns which project macros of actions that build relatively complex semantic structure. In Katcha, where there are no determiners and no adjectives, the semantic structure built by lexical nouns is fully specified and nouns cannot therefore be modified directly. The analysis presented both in chapter 5 and here draws a clear distinction between lexical nouns and pronouns. Lexical nouns form complete noun phrases in their own right; they cannot be specified by a determiner or modified ‘directly’, only by an appositional phrase. The demonstrative pronoun, in contrast, can be the ‘head’ of a larger phrase which may include modifiers. Of course, there are similarities between nouns and pronouns, both being of semantic type *e*, but in terms of syntax — that is, the procedural actions associated with the words — the difference is stark. The structure projected by pronouns is fundamentally underspecified. Nouns project entire epsilon-structures; pronouns, even the non-standard version presented here, retain their function of acting as placeholders to be updated by the parsing of other lexical material. As such, it is no surprise that pronouns should behave differently from nouns in allowing ‘direct’ modification.

In contrast, theoretical frameworks which assume that nouns and pronouns both belong to the same syntactic category, such as ‘DP’, might require more stipulation to explain why lexical DPs cannot be modified while pronominal DPs can. This is not to say that the task would be impossible for such frameworks, but in Dynamic Syntax, it falls out naturally from the grammar.

Chapter 11

Conclusions

Introduction

This study has been data-led. It did not begin from the position of having a specific hypothesis to be tested (other than the very general hypothesis that Dynamic Syntax may be a suitable framework for the analysis of phenomena found in Nilo-Saharan languages). Rather, the goal was to investigate the Katcha language with an open mind, find out what was interesting about it and then try to provide a Dynamic Syntax analysis for that. But in the process certain findings and themes have emerged. This concluding chapter starts by summarizing the main findings of significance from the individual studies in each chapter, before going on to pull out some more general themes.

Section 11.1 describes some of the main findings from part II of the thesis. These are in the areas of number and gender classification and nominal modifiers. In both of these areas Katcha exhibits phenomena which have connections with the surrounding linguistic context, even though some are typologically unusual.

Section 11.2 summarizes the main findings from each of the three chapters of Dynamic Syntax theoretical analysis, pointing out where the theory has had to be extended or adjusted to fit the data and also any other theoretical implications resulting from the analyses.

Finally, section 11.3 provides some final comments about what these findings mean conceptually.

11.1 Typological findings

The morphosyntactic descriptions in part II of the thesis reveal phenomena which connect Katcha with the surrounding linguistic context. Section 11.1.1 summarizes the main findings in the area of number and gender classification. Some of these are typologically unusual and may have implications for the ongoing debate about the genetic affiliation of the Kadu languages. Section 11.1.2 summarizes the main findings with regard to nominal modifiers. In this case, the data are typologically much more typical in the African context. The analysis, of modifiers as appositional nominals, is somewhat unorthodox, but leads to a unified explanation of the source of these typical, but seemingly unrelated, phenomena.

11.1.1 Number and gender

Nominal morphology and classification interact in Katcha in ways which reflect ongoing questions over the genetic affiliation of the Kadu languages.

The morphology of nouns is based on number. The tripartite system of *plurative*, *singulative* and *replacive* number marking is very reminiscent of that found in some Nilo-Saharan (particularly Nilotic) languages. Within the replacive nouns there is some evidence that the morphology may indicate semantic groupings of nouns. In this respect, the nominal morphology is reminiscent of the Niger-Congo noun classes of Katcha's Kordofanian neighbours. For nouns that are morphologically marked for number, gender classification is a property of the number affix, not the root noun. This may mean that the gender of a semantically singular noun differs from its gender when semantically plural, something which is associated with Afro-Asiatic languages.

Katcha has three gender classes, which can be described as being based around the semantic notions of *masculine*, *feminine* and *plural*. The notion of plural as a value of the gender feature is controversial but it has been posited for a number of languages within the Cushitic branch of Afro-Asiatic.

The complex interaction between the categories of number and gender in Katcha is interesting in its own right. But it is particularly interesting in the context of the question of the genetic lineage of the Kadu languages, which have been ascribed to both the Nilo-Saharan and Niger-Congo families by various scholars. In fact, Katcha nominal morphology and classification shows notable characteristics not only of both of these, but also of the third major language phyla in the region, Afro-Asiatic. The gender system is particularly notable in that it appears to include plural as one of its values. This is typologically highly unusual, having only previously been recorded in the Cushitic branch of Afro-Asiatic.

11.1.2 Nominal Modifiers

In chapter 5 it was argued that Katcha nominal modifiers are appositional phrases headed by a demonstrative pronoun. This approach allows a unified treatment of the various types of modifier, including the medial and distal demonstratives which are of a different form to all other modifiers. It is supported by the fact that there are no words in Katcha which can be unambiguously categorised as determiners or adjectives; lexical nouns appear to form complete noun phrases which do not allow phrase-internal modification. Nominal modification is therefore achieved by apposition of an external phrase.

This is a somewhat unorthodox proposal but in fact it fits closely, though not exactly, with analyses of nominal modifiers which have been argued to be typologically typical in the African context. The demonstrative which heads the appositional modifier shows gender agreement with the head noun, thereby encoding the function of ‘Attribution’ and connecting the modifier with the head. In this way it acts as a relative marker of the type found in Afro-Asiatic and Niger-Congo languages. Relative markers are not prototypically pronouns so the demonstrative is not a fully prototypical relative marker, though it may be in process of being grammaticalized as such. Similarly, the possessive construction in Katcha does not alter the form of the head noun and therefore is not a prototypical example of the construct state found in many African languages, but it does represent the kind of structure from which such a phenomenon could develop.

Construing nominal modifiers as appositional phrases headed by a demonstrative pronoun not only provides a unified analysis of the Katcha data, but also gives an example of one way in which two seemingly unrelated, but typically African, constructions might derive from a common source.

11.2 Theoretical findings

A major goal of this thesis has been to provide Dynamic Syntax analyses for the Katcha data. This section summarizes the main findings from each of the three chapters of Dynamic Syntax theoretical analysis in part III.

11.2.1 Verb extensions

Katcha verbs are inherently transitive. If it is semantically plausible for a verb to be transitive, this is always the basic form. Katcha verb extensions decrease valency; their function is to license the absence of a syntactic argument. Most of these VEs decrease semantic valency in addition to syntactic valency, presenting the event described by the verb as having only one participant (though this is not the case for the passive). Katcha has a complete paradigm of valency decreasing verb extensions, allowing originally

transitive verbs to have either one or two arguments and for the subject to be either agent or patient.

Verb extensions were analysed in chapter 8, making use of the Dynamic Syntax construal of terms as expressions of the epsilon calculus. The inherent internal structure of epsilon terms allows a straightforward way to incorporate context dependence into the account. An epsilon term represents an arbitrary witness of some predicate and we can straightforwardly define this predicate as being dependent on the immediate context. Thus it is straightforward to define structures such as ‘Kuku is laughing (at whatever it is that Kuku is laughing at in this instance)’ or ‘Drums are beaten (by whatever it is that beats drums)’.

In terms of the Katcha data, the approach outlined here allows us to neatly capture the difference between (for example) an antipassive verb and a transitive verb with no overt object. A transitive verb decorates its logical object node with a metavariable: a term whose content is underspecified and requires subsequent update. In the case of a transitive verb without an overt object, this update will come from context. In the case of the antipassive, the update comes from the suffix, which supplies a contextually defined epsilon term. The same is true for the other suffixes which reduce semantic valency, unaccusative and middle voice. Although the denotational content of the epsilon term is minimal, it decorates the object node and so prevents it from being instantiated from context by something with more substantive content. Thus ‘Kuku is laughing’ is semantically different to ‘Kuku is laughing at something’, despite the same inherently transitive verb and an equally indeterminate ‘object’ being used in both cases. This analysis might be extendable to languages without morphological antipassives such as for detransitivized verbs in English; there are clear semantic differences between ‘Everyone was reading’ and ‘Everyone was reading something’. The analysis given here for Katcha construes a ‘missing’ argument as being represented by an arbitrary semantic object with properties dependent on context. It is quite straightforward to define lexical actions which specify the properties of the restrictor and thereby use this formalism to model highly context-dependent semantic objects.

11.2.2 Adjuncts, prepositions and case

The choice of pronominal form in Katcha is heavily dependent on the role it plays in the sentence and (in oblique cases) which preposition it follows. It can therefore be concluded that these different forms are realisations of case. Core cases (Nominative and Accusative) are assigned by verbs, while prepositions assign Accusative or Oblique case to their pronominal complements.

As regards the distribution of prepositional phrases, it was argued in chapter 9 that prepositional phrases should be treated as adjuncts. A prepositional phrase specifies an additional property of some expression of the matrix proposition, providing a predicate

which takes such an expression as one of its arguments. That expression may be a term (an individual or event) in the case of an adjectival PP, or a predicate in the case of an adverbial PP. In Dynamic Syntax terms, prepositions induce structure which is LINKed to the matrix propositional tree and which shares semantic content with some node in the matrix tree.

The construal of prepositional phrases as LINKed structures, and prepositions as predicates, explicitly categorises them as modifiers. There are therefore substantial parallels to be seen between prepositional phrases and other modifiers. The distinction between intersective and subsective PPs, for example, parallels the same distinction seen in the semantics of adjectives. Similarly, the treatment of prepositional phrases offered here draws explicit parallels between (adjectival) prepositional phrases and relative clauses. Both prepositional phrases and relative clauses project propositions which share an argument with the matrix proposition. It is therefore not surprising that they should use the same basic technical apparatus. The difference between them is that relatives include an anaphoric device (either a relative pronoun or a resumptive pronoun), which introduces the shared argument into their sub-proposition. Like bare relatives in English, prepositional phrases contain no such anaphoric device so the shared argument must be introduced by the LINK-COPY INTRODUCTION rule.

Sections 9.5 and 9.6 demonstrated that this analysis is also relevant to constructions other than prepositional phrases, and both applications have potential theoretical implications. In section 9.5 it was argued that applicatives can be treated in just the same way as prepositions. The difference between the two constructions is one of constituency: the complement of a preposition immediately follows it, whereas the applied object (which is construed as the complement of the applicative morpheme) does not necessarily follow immediately after the applicative marker. To state that applicatives and adpositions are essentially equivalent is therefore something of a challenge to the importance of the notion of constituency, which is central to most theories of syntax.

The DS analysis given here also has implications for how the relationship between case and adpositions is viewed. Case markers and adpositions are often seen as two ends of a continuum with no great difference between them. However, the DS account of case as a filter on well-formed structure is quite different from the account of adpositions, which induce a LINKed sub-tree, building semantic structure and contributing a semantic predicate. The account offered here can therefore be argued to draw a substantive theoretical distinction between case and adpositions. It suggests that the difference is semantic: case morphemes are semantically null and build no structure, while adpositions contribute semantic content and also induce semantic structure.

11.2.3 Nominal Modifiers

The analysis of Katcha nominal modifiers as appositional demonstrative phrases is modelled in DS by LINK APPOSITION. The properties projected by two noun phrases in apposition are interpreted as holding of a single individual in a straightforward manner.

The relation between the demonstrative pronoun and the rest of the modifier is not quite so straightforward to model. It requires an analysis of demonstrative pronouns which extends the actions associated with them to include the construction of more semantic structure than is standard in Dynamic Syntax. Pronouns are seen not only to be placeholders but also to build partial epsilon structures. Specifically, they project an argument variable and an epsilon binder, but no restrictor. The restrictor may be provided by substitution of a referent from context, in which case the demonstrative has a definite, pronominal interpretation. Alternatively, it may be provided by a verb, in which case the demonstrative essentially acts as a relativiser. Another possibility is that the restrictor's value is constructed from some contextually provided value expressing some relationship, such as possession, between the argument variable and some other term. These possibilities directly model the fact that the interpretation of a demonstrative pronoun is dependent on what follows in the rest of the modifier phrase.

Key to this analysis is the strong formal distinction between pronouns and lexical nouns. The construal of pronouns as underspecified forms contrasts with lexical nouns which build semantic structure so completely specified that nouns cannot be modified directly. Nouns project entire epsilon-structures; pronouns, even the non-standard version presented here, retain their function of acting as placeholders to be updated by the parsing of other lexical material. As such, it is no surprise that pronouns should behave quite differently from lexical nouns.

11.3 Concluding comments

In this section I conclude the study by providing some comments about the conceptual implications of the typological and theoretical findings discussed above.

11.3.1 Taking a dynamic approach

In any scientific enterprise, theory and data should be in a symbiotic relationship: the theory should explain and make sense of the data, but the data should lead and shape the theory. In research like that presented in the present study, whose main aim is the application of a particular theoretical framework to novel data, the continual interaction between theory and data must be a guiding principle.

The way in which the data acts to shape the theory is relatively obvious. Chapters 8–10 provide Dynamic Syntax analyses of various morphosyntactic phenomena found

in Katcha nominals. Some of these analyses are straightforward implementations of Dynamic Syntax as it has previously been used in the analysis of various languages, but others involve adjusting or extending the framework. Such extensions have been noted in the course of presenting the analyses. A clear example is the discussion in section 10.2, which extends the analysis of demonstrative pronouns from the projection of a simple metavariable to a more complex set of actions projecting a partial epsilon term including a nominal variable and epsilon binder in addition to the metavariable. It was noted in that section that this construal of demonstrative pronouns entails a reformulation of the notion of substitution, and that this may be a challenge to the Dynamic Syntax formalism.

The way in which the theory acts on the data may be less blatant, but it is important to make it as explicit as possible. From an epistemological point of view, it is not possible to look at data in a completely objective, non-theoretical manner. The very act of using metalinguistic notions such as ‘noun’ to describe some element of the language being studied implies theoretical assumptions at some level. Indeed, it would be impossible to discuss the data at all without engaging in such theoretical abstraction. The whole point of theory is to provide a systematic framework for these assumptions, allowing the researcher to explain and make sense of the data. As such, I have tried throughout this thesis to maintain an awareness of how the descriptive analyses presented may have been influenced by the theoretical approach adopted. Maintaining a balance between data and theory has been a key objective throughout.

This objective may have been concealed somewhat by the order of presentation, which purports to separate out the descriptions of the data in part II from the theoretical analyses in part III. This somewhat artificial separation was made for two reasons. The first is a practical one. In order to make the study accessible and of benefit to the widest possible range of readership, I have endeavoured to keep the descriptive analysis as general and atheoretical as possible. It is hoped that those whose interest is in questions of typology, the description of Nuba languages or the genetic affiliation of Kadu, but who do not have a background in Dynamic Syntax or formal semantics, may find at least the first two-thirds of the thesis to be of use and of interest.

The second reason for separating the presentation of the data from the theory is that it reflects the fact that this research has been data-led. As noted at the beginning of this chapter, the goal of this research project was not to test a specific hypothesis, but to investigate the Katcha language with an open mind, find out what was interesting about it and then try to provide a Dynamic Syntax analysis for that. In this way, separating the presentation of the descriptive analyses and theoretical analyses in this study reflects the nature of the process as a whole.

The descriptive analyses in chapters 4–7 are thus presented with little or no explicit reference to Dynamic Syntax. Nonetheless it must be acknowledged that certain

interpretations of the data come from approaching it with a dynamic mindset. Again, the analysis of nominal modifiers is perhaps the clearest illustration of this.

In chapter 5 it is argued that the modifiers of nouns in Katcha are themselves appositional nominals. This is an inherently dynamic view. Most traditional grammatical formalisms see syntax as a set of largely static relationships between words, and therefore explain modification in terms of hierarchical notions such as constituency. In contrast, the analysis given here appeals not to a hierarchical relationship between head and modifier but to the incremental build-up of information during the parsing process. One nominal (the ‘head’) is parsed, contributing semantic information to the proposition under construction; a further nominal (the appositional ‘modifier’) is then parsed, contributing further semantic information.

The analysis of nominal modifiers also relies on a sharp distinction between lexical NPs, which do not allow ‘internal’ modification, and pronouns, which do allow such modification. Again, this distinction has its source in a dynamic approach. Central to the dynamic perspective are the notions of underspecification and subsequent update. Anaphoric elements are seen as semantically underspecified, requiring some subsequent update to make them interpretable. In contrast, lexical nouns have a fully specified semantics and so provide significantly less scope for any further specification of their interpretation. From this perspective, it is intuitive rather than surprising that there should be a difference in the way pronouns and lexical NPs undergo modification.

Approaching the data from a dynamic perspective thus opens up the possibility of analysing modifiers as appositional nominals. This analysis provides what I believe to be the best explanation of the facts of the Katcha data, incorporating the role of the medial and distal demonstratives within the account of nominal modification and suggesting a connection between Katcha modifiers and the construct form found in many African languages. These insights would in all likelihood have been missed if the data had not been considered from a perspective whose underpinning presuppositions are dynamic.

It has to be recognised then, that data is not described in a vacuum; the general theoretical assumptions held by the researcher — any researcher — frame the questions he or she asks and influence the descriptive analysis. In this study I have attempted to present the morphosyntactic descriptions in a relatively atheoretical way but the general assumptions underlying these descriptions come from a position which takes incrementality and dynamic processes seriously. Adopting such assumptions brings a particular perspective and yields particular insights in the morphosyntactic descriptions, which otherwise might be missed.

11.3.2 The notion of context

A central aspect of the incremental approach to grammar exemplified by Dynamic Syntax is that it takes seriously the fact that utterances (and the morphemes that make them up) are parsed in context. The various analyses presented in this thesis all involve syntactic processes which are dependent on context. Process and context may interact in different ways, however. In some cases, context is utilised as part of some pragmatic process based on general principles of reasoning and inference. In other cases, reference to context is encoded within the lexical actions of a morpheme. The latter may be in the form of a simple trigger condition specifying the context in which the morpheme may be parsed successfully, or it may go so far as to actually define the value of some tree decoration.

In cases of the first type, the context is referred to in the course of executing pragmatic actions. In these cases, context contributes to the interpretation of a tree, rather than its construction. A clear example is the phenomenon of pro-drop. The standard Dynamic Syntax construal of pronouns (Kempson *et al.* 2001:95-98, Cann *et al.* 2005:67-73) is that they project a metavariable, a placeholder for some term whose reference may be established (among other ways) by the SUBSTITUTION of an appropriate term. There are one or two clearly defined structural constraints which limit the application of SUBSTITUTION, but otherwise it is a freely available process guided by general pragmatic principles such as relevance. SUBSTITUTION is therefore an action which is dependent only on a general, broad context.

Context dependence may also be encoded within the lexical actions of a morpheme. Indeed, lexical entries by definition have a conditional structure that refers to the context in which the lexical actions may operate. This ‘trigger condition’ may simply be used to license the morpheme’s presence by defining the context in which the morpheme may be parsed. For example, the lexical entry for the dative case marker (9.44) merely checks that an applicative verb has previously been parsed and does not affect the growth of the semantic structure in any way. More common is for a lexical entry to include alternative sets of actions, the choice of which is determined by the context. So for example, the lexical entry for a proper noun (10.26) contains two menus of lexical actions, one of which operates when the noun occurs in an ordinary argument context, and one which operates when the noun is interpreted as a possessor. The possessive interpretation is marked by syntactic position, i.e. when the noun occurs following a demonstrative pronoun, so in this case, it is syntactic context which is referred to by the condition within the noun’s lexical entry.

Finally, the analysis of valency-reducing verb extensions given in chapter 8 shows an example where context dependence is even more obvious. The lexical actions associated with these suffixes construct highly context-dependent epsilon terms in which the values of the nodes within the epsilon term are taken from the tree in which it occurs. The

formula value projected by these morphemes is almost completely context dependent, meaning that they can take up an argument role in a proposition while contributing negligible semantic content, thus effectively reducing the valency of the predicate.

11.3.3 Grammar and lexicon

Dynamic Syntax defines two types of syntactic rules: computational actions and lexical actions. The balance between them is explicitly lexicalist. That is, computational actions are limited in number, general, optional and are universally available across languages, while language-specific idiosyncracies are associated with the actions of specific lexical items. In section 9.2 it was noted that bare relatives in English pose something of a challenge to DS because there is no overt morpheme to trigger the transition to a relative clause. The choice of analysis is therefore between positing a phonologically null lexical item (as per Cann *et al.* (2005:114)) or a language-idiosyncratic computational rule (as per Kempson *et al.* (2001:117)), neither of which sit well with the principles of Dynamic Syntax. This choice raises the question of how to evaluate the cost of an extra computational rule: how willing should we be to posit new computational rules (and is it worse than positing a silent grammatical marker)?

One way towards answering this question might be to consider the likelihood of finding constructions which might require new computational rules to account for them. If the lexicalist model of grammar is correct, there should be a limited number of computational actions and most of them should be relevant in most languages. Given enough cross-linguistic data, it should be possible in theory to develop an exhaustive list. At the same time, if computational actions are genuinely optional, the possibility must be left open that there may be some rules which are used only rarely. A computational action that is motivated by data from only one language might be suspicious, but it is not clear how many languages would need to be analysed as using a particular action before it was no longer classed as ‘idiosyncratic’. Besides, it must be theoretically possible that a rule that is dismissed for being language-idiosyncratic may be a genuine rule of the computational system, just one that is not widely used. For this reason I would favour positing a novel computational action over invoking a silent morpheme, though it should always be done tentatively in the hope of confirmation by additional data. In fact, the LINK-COPY INTRODUCTION rule discussed in section 9.2 is an example of exactly this kind. It was introduced to account for English bare relatives and was controversial due to seemingly being language-specific. However, the fact that it has been used to account for Katcha recursive prepositional phrases – an unrelated construction in an unrelated language – makes it seem much more likely to be a universally available rule of grammar.

Ultimately, answering these questions will need more analysis of more data from diverse languages. Only with enough cross-linguistic data would it be possible to

develop (something close to) an exhaustive list of computational actions, or to know whether a given putative action is too idiosyncratic to be kept as a computational rule. As ever in linguistics, there is a need for more fieldwork, more language data and more testing of the theory using data from many and diverse languages.

Of course, we do not want to be positing novel computational actions too frequently. If every language that is investigated turns up three or four extra rules, something has gone wrong! However, it should be noted that in general the analyses of Katcha nominals presented in this study have not required new computational actions to be invoked. The analysis of recursive PPs required the resurrection of LINK-COPY INTRODUCTION and the analysis of relative clauses as headed by demonstrative pronouns required some adjustment to the concept of SUBSTITUTION, but otherwise, the analyses in part III were achieved by the application of pre-existing rules to new data. It is important to note that the way these pre-existing rules apply in Katcha is often different to the way they apply in previously-studied languages. So LINK APPOSITION, which has been used for appositive constructions and for equative copular clauses in English, is used for nominal modifiers in Katcha. Likewise, LINK INTRODUCTION rules used for relative clauses in English can be used for prepositional phrases and applicatives in Katcha. This use of a small number of universal tools to create some quite different linguistic constructions is reflective of the variety and creativity found in human language.

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ADVICE. Advice to Grandaughter.

SPLA. The SPLA attacks Katcha.

TEACH. We must teach our children Katcha.

THIEF. The sorceress identifies a thief.