

ASPECTS OF A KARITIANA GRAMMAR

by

Luciana R. Storto

B.A. in History
Universidade Estadual de Campinas (UNICAMP), 1988

M.A. in Linguistics
Pennsylvania State University, 1994

Submitted to the Department of Linguistics and Philosophy
In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

At the

Massachusetts Institute of Technology

February 1999

©1999 Luciana R. Storto
All rights reserved

The author hereby grants to MIT permission to reproduce and to distribute publicly paper
and electronic copies of this thesis document in whole or in part

Signature of Author: _____

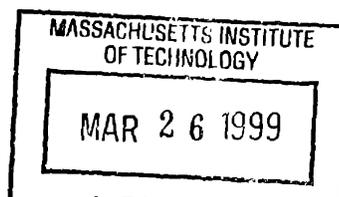
Department of Linguistics and Philosophy
December 31, 1998

Certified by: _____

Kenneth Locke Hale
Ferrari P. Ward Professor of Modern Languages and Linguistics
Thesis Advisor

Accepted by: _____

Michael Kenstowicz
Chair, Linguistics Program
Department of Linguistics and Philosophy



ARCHIVES

ASPECTS OF A KARITIANA GRAMMAR

by

Luciana R. Storto

Submitted to the Department of Linguistics and Philosophy on
December 31, 1998 in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy in Linguistics

ABSTRACT

This dissertation is intended as a description of some theoretically interesting aspects of the phonology and syntax of the Karitiana language. Karitiana is the sole surviving language of the Arikém family (Tupi Stock), spoken today by approximately 200 people living in their own demarcated reservation located 95 Km south of Porto Velho, in the state of Rondonia, Brazil. Chapter 1 describes and analyzes the segmental phonology of the language. With respect to segmental features, special attention is given to the consonants of the nasal series, which undergo partial oralization in environments contiguous to oral vowels. I claim that this phenomenon gives support to the hypothesis that nasality must be represented as a binary feature. Another phenomenon of theoretical interest in Karitiana phonology is vocalic epenthesis, which is triggered by syllabification word-internally and by syllabification as well as stress clash avoidance in certain phrasal environments. I explain the interactions between epenthesis and stress assignment in a derivational model of cyclic phonology. Chapter 2 describes the pitch accent system of the language, in which tones are assigned to the same metrical plane in which stress is computed. In chapter 3, I show that the language is verb-final and that the verb obligatorily raises to the complementizer position (C) in matrix clauses to check tense and agreement features. In dependent clauses, the verb is final, and no agreement or tense is present. I draw a parallel between Karitiana and Germanic verb second languages: in both systems the matrix tensed verb must surface in C, and a phrase must fill Spec,CP. The latter is only a tendency in Karitiana. Standard agreement is nominative (absolute), although whenever the object is A-bar moved to the focus position (Spec,CP) in non-declarative focused clauses, the verb shows ergative agreement. I argue that the functional morphology inserted as a focus marker deactivates the agreement features of I, the functional head that would normally covertly agree with the ergative subject, and as a result, the other functional head bearing agreement features (C) agrees with the ergative subject. Chapter 5 describes other instances of non-declarative and declarative focus constructions.

Thesis Advisor: Kenneth Locke Hale

Title: Ferrarri P. Ward Professor of Modern Languages and Linguistics

ACKNOWLEDGMENTS

The first person I would like to thank is my thesis advisor, Ken Hale, for the unconditional support he gave me during the four and a half years of my stay at MIT. Ken was always happy to discuss every detail of my half worked out accounts of Karitiana data, miraculously finding time in his busy schedule for our weekly appointments. His deep knowledge of typology, modern linguistic theory and field methods gave me the foundation to tackle the difficult job of describing and accounting for theoretically interesting phenomena in Karitiana, a virtually undescribed language. I wouldn't have been able to write this thesis without his guidance.

Many thanks to the other two members of my committee, Morris Hale and David Pesetsky. Morris discouraged my sloppiness from early on with the motto "per aspera, ad astra". Although I may have resisted his advice at times, in more than one occasion I was eventually converted and convinced that he was RIGHT and I was WRONG. Thanks to his insistence on scientific rigor and clarity of exposition, the chapters on phonology are much more intelligible than they would have been otherwise. David always gave me very good advice on how to present an argument. His approach to problem solving - to brainstorm and consider all imaginable solutions and then rule them out one by one on principled grounds - taught me to keep an open mind to alternative analyses.

I have enjoyed discussing my work with many other people, specially Calixto Aguero-Bautista, Maya Arad, Karlos Arregi, Marie-Claude Boivin, Noam Chomsky, João Costa, Bob Dixon, David Embick, Nilson Gabas Jr., Vilacy Galucio, Elsa Gomez-Imbert, Michael Kenstowicz, Jay Keyser, Alec Marantz, Shigeru Miyagawa, Denny Moore, Aryon Rodrigues, Juan Romero, Filomena Sandalo, Hooi Ling Soh, Esther Torrego, Sonny Vu, and Cheryl Zoll.

I don't want to imagine how tedious my social life at MIT could have been without my dear class mates and friends Christopher Bader, Marie-Claude Boivin, Gaurav Mathur, David McKay, Taylor Roberts, Hooi Ling Soh, Fleur Veraart and Susi Wurmbrand. Thank you for many enlightened conversations, nights at the movies, dinner parties, colloquium evenings, and for just being there. You will always have a special place in my heart.

Other people outside of my class with whom I had interesting conversations and /or a specially good time are Calixto Aguero-Bautista, Elena Anagnostopoulou, Maya Arad, Karlos Arregi, Degif Petros Banksira, Pilar Barbosa, Sveva Besana, Rajesh Bhatt, Jonathan Bobaljik, Benjamin Bruening, Anne Cahill, Brigit Cosgrove, João Costa, Maria Cuervo, Henry Davis, Michel DeGraff, David Embick, Jessie Little doe Fermino, Danny Fox, Aaron Goluba, Elsa Gomez-Imbert, Marilyn Goodrich, Tom Green, Mary Grenham, Paul Hagstrom, Maya Honda, Michela Ippolito, Yoonjung Kang, Meltem Kelepir, Cornelia Krause, Vivian Lin, Ingvar Lofsted, Victor Manfredi, Lisa Matthewson, Seth Minkoff, Isabel Oltra-Massuet, Rachel Pearl, Rob Pensalfini, Orin Percus, Jennifer Purdy, Norvin Richards, Juan Romero, Anna Roussou, Danilo Salamanca, Filomena Sandalo, Vaijyanthi Sarma, Phillipe Schlenker, Shigeko Shinohara, Bev Stohl, Carol Tenny, Anthony Theille, Hubert Truckenbrodt, and Sonny Vu.

I thank Wayne O'Neil and Michael Kenstowicz for all the help and support in the many occasions in which I had bureaucratic problems with my Brazilian fellowship. You made huge problems vanish, and that is no small matter for me.

A special thanks to Sally Hale, for making me feel welcome in these parts, and for being my "oracle" in so many spheres of life.

I must specially thank my housemates and friends Elsa Gomez-Imbert and Juan Romero, who, during my last months of dissertation writing, shopped for me, cooked for me, and endured my aloofness and bad moods without complaint.

During the last few days of dissertation writing, I was saved by Karlos Arregi, who helped me edit the document, spending many funny and scary hours with me, piloting Microsoft Word to a safe landing.

I have met at MIT more role models than I could possibly digest. I will keep you all in my mind as food for thought for the rest of my life.

In Belém, I specially thank Denny Moore and the Museu Goeldi crowd. Denny is my advisor and mentor in linguistics, field work and life in general. His vision of how the field of indigenous linguistics can be developed in Brazil became my vision.

In Porto Velho, I must thank my friends and companions Emilia, Laura, Isabel, and the good people of CIMI, and Porto Hotel.

In the field, I thank the Karitiana for cautiously taking me in, and for gradually warming up to me, as they learned to trust me. Some people who made my stays in the village specially meaningful are Alberto, Antonio José, Antonio Paulo, Celson, Cizino, Claudiana, Claudio, Dalvanete, Daniel, Edelaine, Edineia, Elivar, Elizangela, Enedina, Garcia, Geovania, Gumercindo, Inácio, Jacqueline, Jacquesilene, Janete, João, José Maria, Jucinete, Junior, Katia, Leandro, Leriane, Lucinda, Luiz, Oita, Rogério, Rosa, Marcos, Marilena, Marinete, Meireles, Nelson, Pereira, Sarita, Sebastião, Terezinha, Valter, and Vilany.

My friends and family in São Paulo, I thank for their continuous support and friendship, and for all the good times we spent together during my yearly field trips to Brazil. Lucia Helena, Maria Helena, Nereu, Paula, and Vera: I can't wait to join you.

Finally, a word for the three most important people in my life. To my parents, Margarida and Domingos, thank you for giving me the one crucial thing I carry with me at all times: your unconditional love. To Ricardo, thank you for believing in me, for staying by my side even when I couldn't stand myself, and for never ceasing to expect more from me. I dedicate this dissertation to the three of you.

ABBREVIATIONS.....	7
CHAPTER 1 - PHONOLOGY I: SEGMENTAL FEATURES.....	9
0. Introduction.....	9
1. Vowels.....	13
1.1. Vowels and their features.....	13
1.2. Distribution of vowels.....	14
2. Consonants	16
2.1. Consonants and their features.....	16
2.2. Distribution of consonants	17
2.3. A Feature-based analysis of Karitiana consonants.....	21
2.3.1. Distribution of [-continuant, -nasal] consonants	21
2.3.2. Distribution of [-cont,+nas] consonants	24
2.3.2.1. Local spreading of [-nasal] from oral vowels to nasal stops.....	25
2.3.2.2. Closure and release and the binary nature of the feature [nasal].....	32
2.3.3. Distribution of [+continuant] consonants	35
3. Phonological processes and morphophonemic alternations	36
3.1. Nasalization spreading across [+sonorant] segments.....	36
3.2. Intervocalic lenition of [-continuant] segments	37
3.3. Progressive assimilation of a nasal to place features of an oral stop.....	38
3.4. Consonantalization of high front vowels.....	39
3.5. Non-productive palatalization of /t/	40
4. Syllable structure.....	41
4.1. Prohibited codas and obligatory onsets.....	41
4.2. Vowel epenthesis.....	44
4.2.1. Morpheme-internal vowel epenthesis.....	45
4.2.2. Vowel Epenthesis Between Stem and affix	51
4.2.3. Vowel epenthesis inside a complex syntactic head or functional phrase.....	54
4.2.3.1. Compounds.....	54
4.2.3.2. Phonological phrases.....	68
CHAPTER 2 - PHONOLOGY II: PITCH ACCENT SYSTEM	79
0. Introduction.....	79
1. Stress.....	79
1.1. Halle and Idsardi's metrical grid theory and the stress of roots	79
1.2. Stress of affixes	83
1.2.1. Stressed suffixes.....	85
1.2.2. Stress-neutral affixes	86
1.3. Conclusion	88
2. Tone	89
2.1. Stress-based tone rules.....	89
2.2. Phrasal pitch accent and its interactions with the syntax of heads	94
2.2.1. L-insertion	95

2.2.2.	Stress Deletion	97
2.2.3.	Stress Deletion and L-insertion in examples from the text “Gokyp”	98
2.2.4.	Examples of L-insertion and stress deletion in imperatives	104
2.2.5.	Examples of L-insertion and stress deletion in Questions	110
2.2.6.	An analysis of stress deletion	112
2.2.6.1.	Right-headed phrases	112
2.2.6.2.	Left-headed phrases	114
2.2.7.	Conclusion	118
CHAPTER 3 - WORD ORDER.....		119
0.	Introduction.....	119
1.	Verb raising.....	121
2.	Spec, CP as a focus position.....	134
3.	Adverb adjunction as evidence of verb raising in matrix clauses.....	138
4.	Verb-initial word orders and theV-2 effect.....	147
CHAPTER 4 - AGREEMENT IN C		153
0.	Introduction.....	153
1.	Ergative-nominative agreement.....	157
2.	Movement of V to C correlates with the presence of nominative agreement	160
3.	An apparent exception to nominative agreement: the object focus construction.....	163
4.	Theoretical Background	167
CHAPTER 5 - OBJECT FOCUS CONSTRUCTIONS.....		189
0.	Introduction.....	189
1.	The non-declarative object focus construction in relative clauses.....	191
1.1.	Object relativization.....	192
1.2.	Object wh-movement.....	194
2.	The declarative object focus construction.....	205
REFERENCES		214

ABBREVIATIONS

1excl	first person exclusive (excludes the interlocutor)
1p	first person plural (inclusive)
1s	first person singular
2p	second person plural
2s	second person singular
3	third person
3anaph	third person anaphoric
A	adjective
Adjvzr	adjectivizer
Adv	adverb
AFC	agent focus construction (K'ichee')
Aff	affirmative
Ant	[anterior]
AP	antipassive
Asp	aspect
Assert	assertative
Aux	auxiliary
B&H	Bittner and Hale (1996a)
Benef	benefactive
Bk	[back]
C	complementizer
Caus	causative
Cons	[consonantal]
Cont	[continuant]
Cop	copula
Cor	[coronal]
D	determiner
Decl	declarative
Dem	demonstrative
Det	determiner
Dir.evid	direct evidential
DOFC	declarative object focus construction
EC	extraction construction (Karo)
EHRC	externally headed relative clause
Emph	emphatic
Evid	evidential
Fnc	functional head (closed class)
Ger	gerund
Glott. Stop	glottal stop
H&I	Halle and Idsardi (1995)
H&V	Halle and Vergnaud (1987)
Hi	[high]

I	Infl (inflection)
IHRC	internally headed relative clause
Imp	imperative
Impfve	imperfective
Ind.evid	indirect evidential
Interr	interrogative particle
IntP	intonational phrase
Intr	intransitive
Irr	irrealis
Iterat	iterative
KP	Case phrase
Lex	lexical head (open class)
L-insertion	low tone insertion
N	noun
Nas	[nasal]
Neg	negation
Neg.pol	negative polarity item
Nfut	nonfuture
Nomlizr	nominalizer
Non-decl	nondeclarative
Obl	oblique
OFC	object focus construction (non-declarative)
Op	empty operator
P	postposition
Part	participle
Pass	passive
Perfve	perfective
PPh	phonological phrase
Pron	pronoun
PWd	prosodic word
Rd	[round]
Refrtl	referential (aspect)
RN	relational noun (K'ichee')
TO	'to' (oblique in K'ichee')
Tr	transitive
V	verb
V-2	verb second
Vd	[voiced]
Wh	word introducing a content question (wh-word)
?	unidentified morpheme

CHAPTER 1 - PHONOLOGY I: SEGMENTAL FEATURES

0. Introduction

This chapter is a description of Karitiana phonology implemented within a strongly derivational framework. I adopt the model of cyclic phonology proposed by Halle and Vergnaud (1987).

Halle and Vergnaud (1987) (henceforth H&V) provide us with the theoretical apparatus needed to account for the Karitiana data in a straightforward manner. They use the notion of blocks of rules inspired by work done in Lexical Phonology (cf. Pesetsky (1979), Kiparsky (1982, 1983, 1984, 1985), Mohanan (1982), Hale and Mohanan (1985)), where a given rule may appear in more than one block (cyclic or non-cyclic), but depart from that framework in disallowing morphological rules from being linked to particular blocks or strata (influenced by critics of Lexical Phonology such as Aronoff and Sridhar (1983) and Sproat (1985)). That is, they claim that phonological rules typically appear in blocks, at the same time denying the possibility that phonological blocks can be associated with specific morphological processes:

‘We deviate from most proponents of Lexical Phonology in that, following Sproat (1985), we do not assign the rules of morphology – prefixation, suffixation, reduplication, compounding, and so on – to particular phonological strata. Instead, we make the traditional assumption that these rules are the province of a separate model, the *morphology*. In our theory, then, as in SPE, morphology is distinct and separate from phonology. Morphology interacts with phonology in that it creates the objects on which the rules of phonology operate’.

(H&V 1987:78)

The theory is called “cyclic” because it incorporates the notion that words may undergo the same set of rules (the rules of the cyclic stratum) more than once. Based on the empirical observation that languages often distinguish between two classes of affixes which show distinct phonological behavior, Halle and Mohanan (1985) first suggested that different classes of affixes may undergo separate blocks of rules (what they called *cyclic* versus *non-cyclic* affixation). They distinguish cyclic from non-cyclic rules in the following way: in a cyclic block the rules of phonology apply to every morpheme of the word (stem and cyclic affixes independently), while in non-cyclic blocks the rules apply just once to the complete word.

In English, the rule that assigns stress to words is limited to the cyclic (level I) stratum. Affixes which contribute to a change of stress patterns of a root belong to class I. All other affixes are non-cyclic (level II). For instance, in the word *gouvernemental*, the structure is as follows:

1. [[[govern]_I ment]_{II} al]_I

The stem *govern* is stressed in the first syllable, as is the derived word *gouvernement*. The stress assigned to the stem in the cyclic block is preserved because *-ment* is non-cyclic. Since *-al* is a cyclic suffix, the stress assigned previously is wiped out and the word receives penultimate stress. The rules of the non-cyclic stratum apply subsequently to the whole word.

Evidence for the cycle in Karitiana comes from the fact that all roots bear stress, independent of whether they combine with inherently stressed affixes or not, as well as from the interactions between the processes of stress, epenthesis, lenition, destressing,

and tone insertion. Many of these phonological rules apply in different blocks in slightly different conditioning environments.

For instance, vowel epenthesis in the cyclic stratum I and in the non-cyclic stratum II takes place when a consonant is left unsyllabified, whereas in stratum III (reserved for compounds and phonological words) stress clash is an additional condition required for the application of the rule.

Epenthesis, which is necessarily triggered by syllabification, interacts with the rules of stress and lenition in all levels of the phonology in which it applies. In section 4.2 I show that the variety of interactions between morphological constituents and phonological rules suggest that the grammar of Karitiana has 4 levels or strata of phonological rules. The first and second strata (cyclic and non-cyclic respectively) are restricted to rules applying internal to prosodic words¹. The third level applies to compounds and other phonological phrases (PhPs), which syntactically, are units larger than words but smaller than phrases. Phonologically, PhPs are combinations of phonologically dependent words and their “hosts” (syntactically adjacent heads or phrases). A clitic and its host is a typical phonological phrase, as are complex syntactic heads formed by head-movement, or compounds. Other rules applying to phonological phrases are low tone insertion (L-insertion) and destressing. These two rules also apply to constituents which do not undergo level III epenthesis, indicating that a fourth level is needed.

¹ Prosodic words are phonologically distinct units which bear their own stress: words, and strong clitics.

I depart from H&V's theory in that my understanding of which units are computed by each phonological level. To H&V, morphosyntactic units are the constituents that serve as input to the phonological cycle: levels I and II are reserved for words, whereas levels III and IV apply to units larger than words. In my view, morphosyntactic units map into prosodic units, and these prosodic units are the constituents inputted to the various levels in the phonological cycle. The main reason I need to adopt this modified version of the theory is to account for the behavior of compounds in the language. Although compounds are words, with respect to the rule of epenthesis they pattern as level III units. For this reason, we must say that compounds do not ever enter level II of the phonology. That is possible, if level II is not accessible for units larger than a prosodic word.

The first three sections of the chapter describe the distribution of segments, their feature composition, and the phonological rules that apply to specific sets of segmental features to derive their surface forms. Section 4 deals with syllable structure and the rule of vowel epenthesis.

1. Vowels

1.1. Vowels and their features

Karitiana has five vowels, which can be long or short, nasal or oral:

2. Short oral:

i i
e o
 a

Short nasal:

ĩ ã
ẽ õ
 ã

Long oral:

i: i:
e: o:
 a:

Long nasal:

ĩ: ã:
ẽ: õ:
 ã:

The only features involved in phonological rules are the features [high], [back] (rule of consonantalization, cf. section 3.4) and [round] (allophonic variation of labial glide, cf. section 2.3.3). This suggests that the feature [low] is only useful to *phonetically* differentiate a from the other vowels with respect to height. Phonologically, the features [high], [back] and [round] are sufficient to differentiate all vowels from each other:

3. Vowels: (long or short, nasal or oral)²

	-bk	+bk
+hi	I	i
-hi	E	o (+rd) a

² Phonetically, the vowels [e] and [o] can be described as half-open (between [e] and [ɛ] and [o] and [ɔ], respectively). The vowel [i] is often not tense, and lower than high central vowels usually are, to the point that some speakers pronounce it as a schwa.

1.2. Distribution of vowels

Below are lists of minimal pairs or near minimal pairs, showing the relevant oppositions in the distribution of vowels:

4. /a/, /e/, /i/, /o/, /ɨ/

[biki ^a pa]	'bench'
[biki ^e pa]	'cockroach'
[ʔot ^a -]	'to fall'
[ʔit ^a -]	'son (father speaking)'
[ʔet ^a -]	'son (mother speaking)'
[pi]	'fear'
[pa]	'path'
[gop ^a -]	'wasp'
[gip ^a -]	'termite'
[gep ^a -]	'lice'
[i-]	'3 p. agreement'
[i-]	'1 p. sg. agreement'
[a-]	'2 p. sg. agreement'
[ket ^a -]	'blue'
[kat ^a -]	'to sleep'
[ota]	'friend'
[oti]	'noon'
[opi]	'ear-ring'
[opo]	'penis'

5. /ā/, /ē/, /ī/, /ō/, /ū/:

[īn ^a -]	'1 p. sg. pronoun'
[ān ^a -]	'2 p. sg. pronoun'
[nōm ^a -]	'breasts'
[nām ^a -]	'rotten'
[mām ^a -]	'to tighten'
[mēm ^a -]	'to enter'
[sōŋ ^a -]	'firewood'
[sīŋ ^a -]	'to grind (ideophone)'
[opī]	'to cut'
[opī]	'tip, top, edge'
[ām ^b i]	'house'
[ōm ^b i]	'basket'
[dopī]	'ant species'

[pisokō]	'finger nail'
[dʒekā]	'lower part of the face'
[tē]	'sleep (iɔ̃:əpʰone)'
[mōrã]	'wh-word'

6. /a:/, /e:/, /i:/, /o:/, /ɨ:/

[sa:ra]	'alligator'
[sara]	'bad, ugly'
[ʔe:tɿ]	'bee'
[ʔetɿ]	'son (mother speaking)'
[ke:repɿ]	'in the old days'
[kerepɿ]	'to grow'
[so:ʝɿ]	'wife'
[soʝɿ]	'pepper'
[si:po]	'eye'
[sipo]	'seed'
[andi:kɿ]	'cold'
[andikɿ]	'buttocks'
[otʔo:pɿ]	'bamboo'
[otʔi:pɿ]	'bowl'

7. /ã:/, /ẽ:/, /ĩ:/, /õ:/, /ĩ:/

[mã:mɿ]	'frog'
[mãmɿ]	'to tighten'
[ʔõmɿ]	'tadpole'
[ʔõ:mɿ]	'shadow'
[ʔã:mɿ]	'mortar'
[ẽ:mɿ]	'black, dirty'
[ʔi:mɿ]	'rope'
[sĩ:ʝɿ]	'jacamim (bird species)'
[paʔĩ:ʝɿ]	'jacú (bird species)'
[ĩ:ʝɿ]	'bird'

2. Consonants

2.1. Consonants and their features

8. Surface forms:

I. p t tʃ k ʔ
 p̣ ṭ ḳ
 w r ʎ
 ẉ ṛ ʎ̣ ʔ
 β
 β̣

II. m n ñ ŋ
 ṃ ṇ ɲ̣ ŋ̣
 b d ɟ g
 b_m d_n y/ɟ̣ ɟ_n
 b_m^b d_n^d y ɟ_n^ɟ
 m^b n^d ỹ ɟ^ɟ
 ẉ ṛ ʎ̣
 β

III. s
 ts

IV. w r h
 ẉ ṛ ħ
 β
 β̣

9. Consonants

	[labial]	[+cor, +ant]	[+cor, -ant]	[velar]	[glottal]
[-cont, -nas]	p	t		k	
[-cont, +nas]	m	n	ñ	ŋ	
[-cont, -son]		s			
[-cont, +son]	w	r			h

Justification for the featural analysis proposed in (9) will be given in section 2.3.

2.2. Distribution of consonants

The minimal pairs which reveal the relevant oppositions in the distribution of consonants are listed below³:

10. [p], [t], [k]:

[pa]	'path'
[opo]	'penis'
[pop̄]	'dead'
[siip̄]	'salty'
[siit̄]	'gray'
[ti]	'mother'
[oti]	'moon'
[hik̄in ^d it̄]	'stone axe'
[kōm ^b o]	'cocoa'
[pok̄]	'white'

Labial, coronal and velar stops are unreleased word-finally: [p̄], [t̄], [k̄]. The lenited and nasalized allophones of these stops are triggered by lenition rules (cyclic and non-cyclic, cf. 3.2) and nasalization spreading (cf. section 3.1), respectively.

11. [tʃ]:

[tʃak̄]	'to bite (ideophone)'
[mōrōtʃa]	'tight, close, dependent'
[tʃōrōwā]	'running water (ideophone)'
[iʃtʃa]	'1p.sg. pronoun'

The occurrence of [tʃ] is extremely rare, and limited to onset position.

12. [ʔ]:

[ʔet̄]	'son (mother speaking)'
[saʔep̄]	'leg'
[otʔo:p̄]	'bamboo'
[ʔirip̄]	'tapir'
[ōʔi]	'no!'

³ Stressed syllables are marked in bold. The symbol $\bar{\cdot}$ stands for "unreleased".

[sokõʔi]	'to tie up'
[oɬt]	'to heal'

Note that the distribution of the glottal stop seems to be predictable⁴: it is limited to onset position in stressed syllables.

The labial, coronal, and velar nasal consonants have a similar distribution⁵ (cf. section 2.3.2), and for that reason are considered to be part of the underlying nasal series.

13. [m], [n], [ɲ], [ỹ], [ɲ], [ɲ]:

[mārām-]	'fly'
[nām-]	'rotten'
[ñõɲ-]	'teeth'
[pĩỹõɲ-]	'mixture'
[dʒeokõn-]	'woodpecker'
[nẽɲã]	'to lie down'
[sõɲ-]	'firewood'
[põn-]	'to play'

The fully nasal allophones [m], [n], [ɲ], [ỹ], [ɲ], [ɲ] occur: (i) in the beginning of a word followed by a nasal vowel, (ii) inside a word, adjacent to nasal vowels, or (iii) in the end of a word, preceded by a nasal vowel. The palato-alveolar /ɲ/ lenites to [ỹ] in environment (ii), and surfaces as the palatal [ɲ] in environment (iii) (details to be discussed in section 2.3.2).

⁴ See section 2.3.1 for discussion.

⁵ David Landin, who studied Karitiana before me, was the first linguist to identify the pre and post-oralized allophones of nasal consonants (Landin, D. and R. Landin 1973) in Karitiana. His analysis of the segmental phonology of the language differs from mine mainly in that he posits a glottal stop and a palatal glide as phonemic.

14. [ᵇm], [ᵈn], [y], [ɟ], [ɕŋ]:

[irihoᵈnɾ]	'thank you'
[dʒiᵈŋɾ]	'to stand'
[ʔoᵇmā]	'pierced'
[haᵈnā]	'to speak'
[oropoɟɾ]	'squirrel'

The pre-oralized allophones [ᵇm], [ᵈn], [ɕŋ] occur: (i) inside a word, when preceded by an oral vowel and followed by a nasal vowel, (ii) in the end of a word, preceded by an oral vowel. The palato-alveolar /ɲ/ surfaces as [y] in environment (i) and as [j] in environment (ii) (cf. section 2.3.2 for discussion).

15. [mᵇ], [nᵈ], [ŋ], [ỹ], [ŋᵈ]:

[nᵈopi]	'ant species' (older speakers)
[mᵇoroti]	'paca' (older speakers)
[ānᵈikɾ]	'buttocks'
[pōŋᵈipɾ]	'shy, quiet'

The post-oralized allophones [mᵇ], [nᵈ], [ŋᵈ] appear: (i) inside a word, preceded by a nasal vowel and followed by an oral vowel, (ii) in the speech of older Karitiana only, in the beginning of a word followed by an oral vowel. The palato-alveolar /ɲ/ surfaces as [ỹ] in environment (i).

16. [ᵇmᵇ], [ᵈnᵈ], [y], [ɕŋᵈ]:

[apiᵇmᵇikɾ]	'to push'
[kiᵈnᵈa]	'thing'
[sopaᵈŋᵈijɾ]	'eyebrows'
[giyo]	'corn'

The pre and post-oralized allophones [ᵐᵐᵇ], [ᵈᵈᵈ], [ɛ̃ɛ̃] occur inside a word, when preceded and followed by oral vowels. The palato-alveolar nasal lenites, surfacing as an oral glide [y] in that same environment.

- | | |
|--------------|-----------------------------|
| 17. [dikisi] | 'spider' (younger speakers) |
| [boroti] | 'paca' (younger speakers) |
| [gop̃] | 'wasp' (younger speakers) |
| [dʒopiʔop̃] | 'nose' (younger speakers) |

Nasal consonants surface as [b], [d], [dʒ], [g] word-initially, when followed by an oral vowel (in the speech of Karitiana youngsters).

In the speech of older Karitiana, [ts] is in free variation with [s] but in the speech of younger Karitiana, [s] is the only allophone of this phoneme.:

- | | |
|----------------|--------------------------------|
| 18. [s], [ts]: | |
| [sop̃] | 'hair' (younger speakers) |
| [tsop̃] | 'hair' (older speakers) |
| [sa:ra] | 'alligator' (younger speakers) |
| [pasēñ] | 'cricket' (younger speakers) |

Among the [+continuant] consonants, /s/ is the only one which blocks long-distance nasalization spreading (cf. 3.1). For that reason we know that nasalization is blocked by [-sonorant] consonants.

- | | |
|---------------------------|-----------------|
| 19. [w], [w̃], [β], [β̃]: | |
| [kowot̃] | 'sweet' |
| [-wak]/[-βak] | 'verb suffix' |
| [ōwā] | 'child' |
| [ʔeβet̃] | 'thin' |
| [dʒeβi] | 'flute' |
| [paβak] | 'silent, light' |

Labial glides become unrounded after unrounded vowels:

20. [+labial, +round] → [-round] / [+vocalic, -round] ____

The [+continuant, +sonorant] consonants [w], [r], [h], occur word-internally in onset position, and, unlike the [+continuant, -sonorant] /s/, allow the nasal feature of a preceding vowel to spread through it (cf. section 3.1):

21. [r]:

[akiri]	'vulture'
[pipiri]	'hawk'
[nōrōŋ~]	'snail'

22. [h]:

[oho]	'potato'
[ohōrōrā]	'nambú-galinha (bird species)'
[ōñi]	'lizard'

2.3. A Feature-based analysis of Karitiana consonants

2.3.1. Distribution of [-continuant, -nasal] consonants

Row I of the consonant chart in (8) depicts voiceless oral stops, which are phonetically defined as [-continuant, -voiced, -nasal]. However, since the feature [voice] does not play a role in phonological rules, it is more economical to define these consonants by the smaller set [-continuant, -nasal] as in (9). The segments *p*, *t* and *k*, belong to a natural class because they show identical phonological behavior in the following environments: (i) they occur in onset and word-final positions, before or after

all types of vowels, in opposition to nasal stops, which also occur as codas word-medially, and to [+continuant] segments, which are limited to onset position, never occurring word-finally. I will argue in section 4.1 that word-final voiceless stops are not syllabified, based on the fact that they do not show up as codas word-internally, nor ever occur adjacent to a consonant-initial suffix (cf. section 4.2.1 and 4.2.2 on epenthesis). (ii) they lenite morpheme-finally (cf. section 3.2), when followed by a vowel-initial morpheme. (iii) they are unreleased word-finally. The phonological processes described in (ii) and (iii) above are *not* restricted to segments which are [-continuant, -nasal], but instead affect all [-continuant] sounds.

It is clear from the allophonic variation exhibited in the different points of articulation of [-continuant, -voiced] segments, that not all stops behave alike. The voiceless palato-alveolar *tʃ* and the glottal stop *ʔ* do not pattern with other stops with respect to at least some phonological rules. Namely, they don't lenite, and they never occur word-finally (cf. section 4.1). This can be explained if we posit that the surface forms *tʃ* and *ʔ* are predictable. Indeed, it is not difficult to make a case for this hypothesis, as shown below.

Voiceless palatal stops are limited to seven words in the corpus, some of which are onomatopoeic as in (23)-(25), and others which can be explained as the result of the restricted palatalization rule (to be discussed in 3.4). The latter palatalizes a *t* to *tʃ* after a palatal stop (cf. (26)-(28)):

- | | | |
|-----|---------------------------|----------------------------|
| 23. | [tʃak~] | 'to bite' |
| 24. | [tʃõrõwã] | 'running water' |
| 25. | [tʃĩrĩβã] | 'trickle of running water' |
| 26. | /i+i+ta/ → iʃta → [iʃtʃa] | '1pl. pronoun' |
| 27. | /a+i+ta/ → aʃta → [aʃtʃa] | '2pl. pronoun' |

28. /so+i+ ta] → sojta → [sojtʃa] 'wild pig'
 29. [mōrōtʃa] 'dependent, tight'

The only occurrence of the voiceless palatal for which we have no immediate explanation is (29). The semantics of *mōrōtʃa*, however, suggests that the word might contain a putative onomatopoeic morpheme *tʃa*, which, judging from (23) could be roughly translated as “grab”, or “snatch”. If this is correct, the occurrence of *tʃ* is onomatopoeic as well. The stress pattern of (29) indicates that the word is bimorphemic, and contains an unstressed suffix: *mōr*<*ō*>+*tʃa* (cf. stress and epenthesis rules). Based on the evidence presented above, I consider all occurrences of the segment *tʃ* to be predictable.

Now we must deal with the phonological status of the glottal stop. We saw in 2.2 that the distribution of glottal stops is almost predictable in Karitiana: in all environments in which it occurs, it is the onset of a stressed syllable. However, since there exists a small class of stressed onsetless syllables in the language, one could argue that it is not accurate to hypothesize that glottal stops are epenthetic. Some contrasts are shown below:

30. [ʔō:mɾ] 'shadow'
 31. [ē :mɾ] 'black'
 32. [ō. ʔɪ] 'no'
 33. [ō.ē] 'dear'⁵
 34. [o.ɪtɾ] 'to cure'
 35. /i+a+t/ → [i.ʔatɾ] 'I did (non-declarative)'
 36. /a+ot/ → [a.otɾ] 'you caught (non-declarative)'
 37. /a+ep/ → [a.ʔepɾ] 'your tree'

If all glottal stops were inserted by rule as the onset of onsetless stressed syllables, then (31), (33), (34) and (36) would have to be listed as exceptions. However, if we hypothesize that glottal stops are underlying forms, we have no explanation for their

limited distribution to onsets of stressed syllables, which does not parallel that of other voiceless stops. I believe the reasons for excluding the glottal stop from the underlying inventory are stronger than the reasons for including it. I conclude that Karitiana has a rule that inserts a glottal stop as the onset of a stressed onsetless vowel:

38. $\emptyset \rightarrow ? / _ . V(C)$

The small class of words exemplified in (31), (33), (34) and (36) have to be listed as exceptions to rule (38).

2.3.2. Distribution of [-cont,+nas] consonants

In the following two sections, I will show that the feature [\pm nasal] in vowels plays a crucial role as far as the phonology of Karitiana is concerned. I claim that vowels have to be represented as either [+nasal] or [-nasal], since both values of the feature participate in spreading processes.

⁵ This word is used as a vocative, and judging from its meaning and form, it could be onomatopoeic.

2.3.2.1. Local spreading of [-nasal] from oral vowels to nasal stops

Karitiana has a spreading process which I analyze as the assimilation of a negative nasality feature [-nasal] from oral vowels to neighboring nasal stops, resulting in their pre and/or post oralization. This process is a little understood phenomenon cross-linguistically⁶, and deserves further study. In this section, I describe the facts, and account for the phenomenon with a rule of local assimilation.

We saw that nasal consonants occur at four different points of articulation, and become partially oralized when contiguous to oral vowels. The way in which oral vowels modify nasal consonants is exactly the same in bilabial, coronal (that is, [+coronal, +anterior]) and velar points of articulation. In these cases, nasals are partially pre or post oralized when preceded or followed by oral vowels (as in (39)-(46)):

39. Environment V__ V:

/apimik/ →	[apib ^b m ^b ik~]	'to pierce'
/kina/ →	[ki ^d n ^d a]	'thing'
/sopariñ/ →	[sopa ^g ŋ ^g ij~]	'eyebrows'
/ŋiño/ →	[giyo]	'corn'

40. Environment ##__ V:

/moroti/ →	[boroti]	'paca'
/neso/ →	[deso]	'mountain'
/ŋokip/ →	[gokip~]	'sun'
/ñere?op/ →	[dzere?op]	'anus'

⁶ Other Brazilian languages which have pre and post-oralized nasals are Kaingang (Wiesemann (1972), (1978) and Apinaye (Ham (1961))). Since these languages are not genetically related to Karitiana (Rodrigues (1986) classifies them as belonging to the Ge family), the process of local spreading of [-nasal] from oral vowels to nasal stops can arguably be described as an areal linguistic trait. This phonological process, which seems to be limited to an area of the world whose languages have barely been described, when better understood, is certain to add to our knowledge of linguistic typology and universals. It is important to note that Ladefoged and Maddieson (1996) do not acknowledge the existence of pre and post-oralized sounds in their recent book, which is intended as an analysis of the sounds of the world's languages.

41. Environment V ___ ##:

/kam/ →	[ka ^b m [~]]	'now'
/osen/ →	[ose ^d n [~]]	'to rejoice'
/te:ŋ/ →	[te:ŋ [~]]	'to fly'
/soñ/ →	[soj]	'wife'

42. Environment \tilde{V} ___ \tilde{V} :

/āmāŋ/ →	[āmāŋ [~]]	'to plant'
/ʔinā/ →	[ʔinā]	'small'
/ŋōŋōrōŋ/ →	[ŋōŋōrōŋ [~]]	'summer, year'
/mīñō/ →	[mīyō]	'Brazil nut'

43. Environment ## ___ \tilde{V} :

/mēm/ →	[mēm [~]]	'to enter'
/nōm/ →	[nōm [~]]	'breasts'
/ŋōŋōrōŋ/ →	[ŋōŋōrōŋ [~]]	'summer, year'
/ñōŋ/ →	[ñōŋ [~]]	'teeth'

44. Environment \tilde{V} ___ ##:

/sōm/ →	[sōm [~]]	'red'
/mān/ →	[mān [~]]	'husband'
/īīŋ/ →	[īīŋ [~]]	'cicada'
/irōñ/ →	[irōŋ [~]]	'suī monkey (species)'

45. Environment V ___ \tilde{V} :

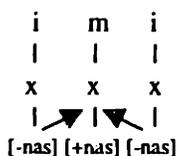
/hinūnā/ →	[hi ^b mūnā]	'roasted'
/oñiinā/ →	[oyii ^d nā]	'rainbow'
/esiŋā/ →	[esiŋā]	'water fall'

46. Environment \tilde{V} ___ V:

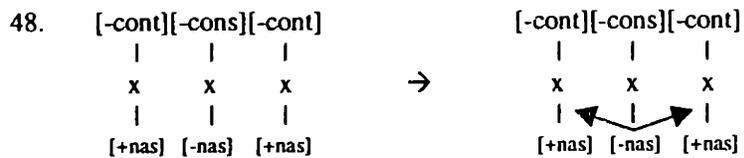
/āmō/ →	[ām ^b o]	'to climb'
/osēna/ →	[osēn ^d a]	'side, waistline'
/pōŋip/ →	[pōŋ ^ŋ ip [~]]	'quiet, timid'

I analyze the assimilation of a [-nasal] feature to nasal stops as local spreading from oral vowels to contiguous nasal consonants as in (47):

47.



The rule is represented in (48) below:



In section 2.3.2, we saw that the palato-alveolar nasal (featurally defined as [+coronal, -anterior]) undergoes an obligatory rule of lenition in intervocalic environments which does not apply to other nasals. I formalize this rule in (49):

49. $[-\text{cont}, +\text{cor}, -\text{ant}] \rightarrow [+cont, +\text{voiced}] / V_V$

A consequence of this lenition rule is that it creates a configuration in which the rule of nasal spreading (cf. section 3.1) applies in environment (44), neutralizing the distinction between environments (46) and (42). The same neutralization seems to take place between environments (39) and (45), only there the feature which spreads across the lenited consonant in (45) is [-nasal]. In order to explain the oralization of the nasal vowel in this case, the rule of palato-alveolar lenition in (49) must apply after [-nasal] spreading from the vowel to the nasal stop. Otherwise, it would not be possible to explain why palato-alveolars undergo the [-nasal] spreading rule in the same way that other nasal stops do, since after the application of (49) they become [+continuant]. The rule which oralizes the nasal vowel in (45) seems to be the counterpart of (48), the local rule that pre and post-orals nasal stops. The difference between them is that the spreading process starts in a [-nasal] glide in the former and in a vowel in the latter:

given by Ladefoged and Maddieson is to be extended to the data in (39), one would have to assume that partially oral *closures* are also present in languages as a strategy to avoid the nasalization of an oral vowel by a following nasal consonant. If that were correct, we would have to assume that the following processes operate in Karitiana: (i) nasal consonants tend to spread nasality to neighboring vowels, in both directions. (ii) the language has a strategy to avoid nasalization of oral vowels contiguous to nasal consonants: a change or adjustment in the articulation of both the closure and the release of the nasal consonants.

It is hard to show that either (i) or (ii) above are categorically wrong. However, I believe the explanation I give to the phenomenon of partial oralization of nasal consonants in Karitiana is more adequate than an explanation of the type proposed by Ladefoged and Maddieson. That is, although Acehnese may very well have orally released nasals, Karitiana does not – the oral and post-oralized segments of Karitiana are of a different nature than those of Acehnese. One argument to be made in substantiation of my claim is that complete oralization of the nasal consonant may take place as an alternative pronunciation of the words in (39). Also, in word-initial environments, when followed by an oral vowel, a nasal consonant is completely oralized (*b, d, g, dʒ*). It would be hard to explain why this is the case explain in Ladefoged and Maddieson's theory, because these phenomena go well beyond a simple change in articulation of the underlying nasal. Nonetheless, it is necessary that a systematic study of the variation in pronunciation of the same word be carried out before a strong case is made for the oralization hypothesis. The main problem is that it is not yet clear whether the variation that has been observed is limited to the environment of the words in (39). As shown in

(53), one and the same speaker may pronounce the same word in two or three different ways:

53.

eŋ̃i, ẽŋi, egi	'to vomit' (Walter Karitiana)
pēn ^d ot, pe ^d n ^d ot	'wide' (Lindalva Karitia)
ām ^b i, abi	'house' (Luiz Francisco Karitiana)
kī n ^d a, kida	'thing' (Luiz Francisco Karitiana)
ām ^b i, a ^b m ^b i	'house' (Cizino Karitiana)
kida, ki ^d n ^d a	'thing' (Cizino Karitiana)

Note that, strictly speaking, the variation implies variation in the underlying forms of each word since oral vowels never occur contiguous to nasal consonants without causing oralization, and nasal vowels never occur contiguous to oralized portions of nasal consonants. However, when the language is analyzed as a whole, it is possible to see that the tendency towards oralization is stronger than the tendency towards nasalization in the distribution of the allophones of the nasal consonants.

Incidental evidence that oralization of nasal segments by contiguous oral vowels is correct comes from an accent that is detectable when some Karitiana speak Portuguese. The proper name *Nelson*, pronounced in Portuguese as *New.sõ*, surfaces in Karitiana as *De.o.sõ*, and the Portuguese word *inimigo* (*[i nĩ mĩ g^u]*) 'enemy' surfaces as *i dnĩ mĩ g^u*.

Another piece of evidence in favor of the oralization hypothesis is the phonological process (to be described in 3.1) of rightward nasalization spread from a vowel throughout [+sonorant] consonants. This process enables a nasal vowel to spread its nasal feature in a long distance manner, not only to a neighboring [+sonorant] consonant, but to subsequent vowels and [+sonorant] consonants. The rule of nasalization spread is blocked only by [-sonorant] segments. For instance, in (46) The [+nasal] feature

of the vowels is unable to spread rightward, throughout the following nasals, as if postoralization was obstruent-like in nature. If nasal stops were completely [+sonorant] in (46), no blocking of the expected spreading should occur. The way nasalization interacts with local oralization indicates that the post-oralization of a nasal indeed creates a partial obstruent-like occlusion, which, being [-sonorant], prevents spreading of the feature from a previous vowel. This outcome is expected if post-oralization is seen as the spreading of [-nasal] to the closure or release phases of a stop, but not if it is interpreted as resulting from a slight change in the articulatory gesture. I take this as evidence that the partially oralized nasals in Karitiana are different from the orally released nasal consonants of Acehnese discussed by Ladefoged and Maddieson. Although these authors transcribe the special class of “orally released nasals” as *post-oralized*, their description of the articulation of such nasals does not include a change in articulation that involves an oral occlusion, but just one in which the nasal is pronounced as less nasal than regular nasals, achieved through a “lowering of the velum to a lesser degree”.

A final argument for the oralization hypothesis is that the long distance spreading of a [+nasal] feature from vowels is specially in tune with my account of nasal consonants, because, in this view it is possible to generalize that all [\pm nasal] spreading in Karitiana originates in [-consonantal] segments. The same is true of the rule that spreads [-nasal] from glides.

2.3.2.2. Closure and release and the binary nature of the feature [nasal]

The distribution of nasals in the inventory of Karitiana points toward one important theoretical issue, namely, the characterization of nasal stops proposed by Steriade (1993). Steriade (1993) claims that stops have a closure and a release phase, which may be associated or not with the feature [nasal]. In her theory, nasal is a privative feature, that is, a feature which is either present or absent, but crucially *not* binary. This section demonstrates that Karitiana is a clear counterexample not only for Steriade's theory.

Steriade's typology of stops is represented in (54)⁷, and show that it is inadequate to represent the surface forms of nasal stops in Karitiana:

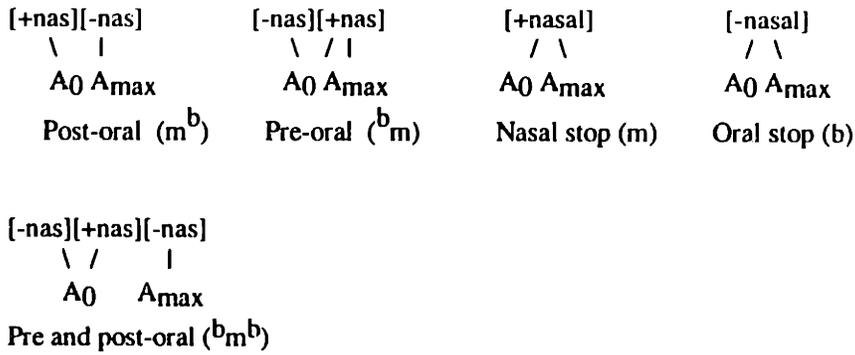
54. Steriade (1993)

[nasal] /	[nasal] \	[nasal] /\	
A ₀ A _{max}			
Prenasal (mb)	Postnasal (bm)	Nasal stop (m)	Oral stop (b)

We saw in (39) that nasal stops may be partially oral and nasal in a more complex way, which cannot be captured in Steriade's system. I propose that the feature nasal must be binary and that the closure phase of a stop may be doubly linked to different values of the nasal feature:

⁷ Where A₀ means closure (aperture₀) and A_{max} means release (aperture_{max}).

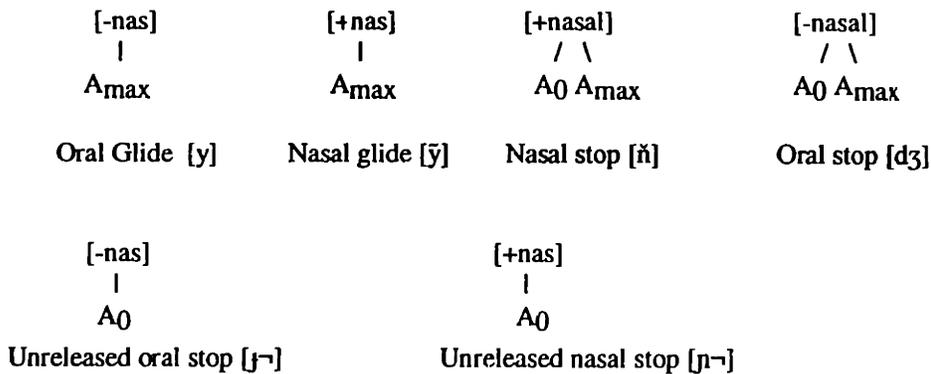
55.



The four first diagrams in (55) represent the same segments schematized in (54). The fifth diagram cannot be represented in Steriade's (1993) theory. I take that as evidence that double linking in A_0 and the binarity of the feature nasal must be part of universal grammar if the behavior of nasal stops in Karitiana is to be explained.

For the sake of completeness, it is important to show whether the biphasic model adopted also accounts for the allophonic variation of the palato-alveolar nasal.

56. Palato-alveolar



Crucially, palato-nasals are never linked to more than one value of the feature nasal because they obligatorily lenite (loose their closure phase) intervocalically. In the same

intervocalic environment, other nasals surface as post-oral, pre-oral or pre and post-oral as in (55). Word-initially, however, palato-nasals keep both their closure and release phases.

For the sake of argument, let us examine the competing hypothesis that the underlying segments in question are prenasal (*mb*, *nd*, *ŋg*), and that the triphasic allophones (*bmb*, *dnd*, *gŋg*) are a result of the delayed onset of nasality after an oral vowel (cf. Storto (1993) for other possible analyses). If this account holds, we can keep Steriade's system intact, which amounts to a simpler UG. However, we will see that the language specific rules have to be complicated a great deal in this analysis. Word-initially in the speech of older speakers, and in words such as *ãmbi* the prenasal surface forms can be explained without resort to any special rule: they are simply the default expression of the underlying forms. For all other surface forms, however, something special must be said. First, we must have a rule of local assimilation of nasality to accommodate allophones with a nasal release:

57. Local assimilation rule: Spread [nasal] from a vowel onto Amax releases within the same syllable.

This rule spreads the nasal feature from a vowel to the prenasal consonant adjacent to it iff they are in the same syllable. It accounts for the nasal allophones of the stop in environments, since in those cases the stop is either the onset ($## _ \tilde{v}$, $\tilde{v} _ \tilde{v}$) or the coda ($\tilde{v} _ ##$) of a nasal vowel. In words such as *hi.bmi.nã*, rule (57) plus the delayed onset of nasality have to be evoked, whereas in *a.pi.bmbik* only the latter is at work.

The two final cases left to be discussed are more problematic. First, in word-final environments, when preceded by an oral vowel, the wrong prediction is apparently made:

that a triphasic stop would surface (**kabmb*). At closer inspection, however, it is clear that the attested form, *kabm*, can be explained as the unreleased version of the predicted form. Given that all stops are unreleased in word-final position, it is in fact predicted that A_{\max} of the underlying *mb* will be deleted, yielding the correct output after the application of the delayed nasality onset: *bm*. Finally, the last and most problematic case: that of word-initial environments followed by oral vowels. As seen in (40), stops are completely oralized in this position. The hypothesis under analysis cannot account for this fact in any natural manner, because it does not have a feature [-nasal]. To capture the data in (40) in this framework, it would be necessary to posit a rule of deletion of the feature [nasal] in word-initial position, which is completely ad hoc. I conclude that the only analysis of the Karitiana data that would be compatible with Steriade's model fails empirically. I take this as further evidence that nasality must be represented as a binary feature.

2.3.3. Distribution of [+continuant] consonants

The surface variation of [+continuant] segments is as follows: labial glide assimilates the feature [+round] from a preceding round vowel *o*, and otherwise surfaces as unrounded, as in (58):

58.

kow<o>t	'sweet'
õwã	'child'
ereβok	'the name of a mythical star'
dʒeβi	'flute'
kyβi ^d nã	'to rub'
taβ<a>ra	'salty'

The coronal *s* is pronounced as *ts* (or maybe it is in free variation with *ts*) in the dialect of older speakers:

59.

sop	'hair'
tsop	'hair'

The labial, and glottal continuants, as well as the flap *r*, by virtue of being sonorants, allow nasalization from a previous vowel to spread through them (cf. section 3.1). The glottal stop, in spite of not being part of the underlying inventory, is also nasalized by nasalization spread, indicating that glottal stop epenthesis occurs before long distance nasalization.

In terms of their distribution in the syllable, [+continuant] segments are radically different from [-continuant] segments, in that the former are limited to onset position (cf. section 4.1).

3. Phonological processes and morphophonemic alternations

3.1. Nasalization spreading across [+sonorant] segments

Long distance spreading of [+nasal] is possible in Karitiana. This feature spreads word-internally from a nasal vowel in rightward direction, passing through sonorants (*/h, r, β, ʔ, m, n, ŋ, ñ/*) as in (60), and being blocked by the presence of a [-sonorant] sound (*/p, t, k, s, tʃ/*) (as in (61)):

60.

ohōrōrā	'nambu-galinha (bird species)'
ōñī	'lizard'
tʃōrōwā	'running water (onomatopoeia)'
sokōʔi	'to plant'
opikīyō	'horn'
āmēm	'to enter'
ʔinā	'small'
sōŋō	'firewood'

61.	<i>ɲõnso</i>	'woman'
	<i>mõrõtʃa</i>	'tight, close, dependent'
	<i>hãñipa</i>	'heart'
	<i>pipĩtĩ</i>	'gavião real (species of hawk)'
	<i>hĩñyõko</i>	'no longer sang'

3.2. Intervocalic lenition of [-continuant] segments

The lenition rule in (63) affects [-continuant, +consonantal] codas by making them [+continuant, +voiced] when they are followed by a vowel-initial morpheme. The boundary in the lenition rule can be a morpheme boundary (+), or a word boundary (#):

62.	$p \rightarrow w/\beta$	$m \rightarrow \tilde{m}/\beta$
	$t \rightarrow r$	$n \rightarrow \tilde{n}$
	$k \rightarrow \gamma$	$\eta \rightarrow \tilde{\eta}$
	$j \rightarrow y$	$\eta \rightarrow \tilde{y}$

63. Lenition rule: $[-\text{continuant}, +\text{consonantal}] \rightarrow [+ \text{continuant}, +\text{voiced}] / V_ [V$

The rule of coda well-formedness, which blocks [+continuant, -nasal] segments from occurring in coda position, and the prohibition against onsetless syllables (cf. section 4.1) force lenited segments to resyllabify as onsets.

Karitiana has another rule of lenition which is limited to underived environments.

The stops that can be input to this rule are *p* and *t*, but not *k* or nasal stops:

64. p, t → [+cont, +vd] / V. __ V (morpheme-internal⁸)

3.3. Progressive assimilation of a nasal to place features of an oral stop

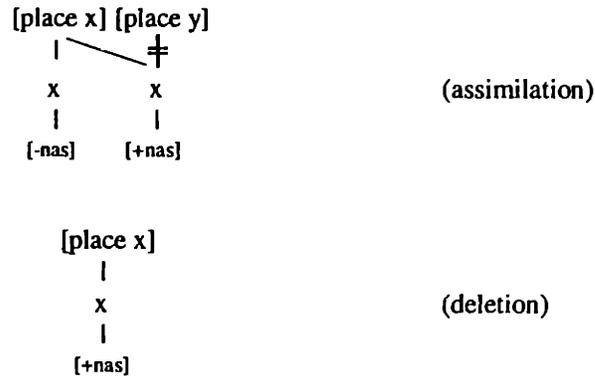
When a morpheme-final oral stop is followed by a morpheme-initial nasal, a rule of assimilation applies according to which the place features of the former spread to the latter. The oral stop deletes as a result of this process:

65.

ʔet+nā → ʔe. ^d nā	'child-adjectivizer = pregnant, with child'
ʔop+nā → ʔo. ^b mā	'hole-adjectivizer = pierced, with hole'
a.ndik+nā → a.ndi. ^g ṅā	'buttocks-adjectivizer = with buttocks'
si.po _J +na → si.po. ^J nā	'tail-adjectivizer = with tail'

I represent this assimilation process as follows:

66.



⁸ In section 4.2.1. we will see that this rule occurs in the cyclic stratum, which is reserved for roots and level I affixes.

3.4. Consonantalization of high front vowels

We must posit a phonological rule which causes *i* to turn into the voiced palatal stop *ɟ* between a VC sequence:

66. [+hi, -bk, -cons] --> [+cons] / V ___ C

The rule of consonantalization described in (66) transforms a high front vowel into a palatal stop (*i* → *ɟ*) between a vowel and a consonant. This phonological process is motivated by the universally marked status of onsetless syllables.

67. koɟ.pa 'pineapple'
68. eɟ.pat 'female'
69. /ko+i+pa/
70. /e+i+pat/

This rule explains some apparent exceptions to epenthesis. We will see in section 4.2 that an epenthetic vowel is predicted to surface between a palatal stop and an obstruent (a [-cont, -nasal] consonant) in (67)-(68). The surface forms of the words in question can be accounted for if underlyingly their structures are the ones in (69) and (70) respectively, and if the consonantalization rule applies after epenthesis.

A parallel example is (71), which is known to be polymorphemic (c.f. (72)) and to contain the third person morpheme *i*-, which is required by some inalienably possessed nouns and adjectives:

71. sōɟ.bap 'sucuri (species of snake)'
72. /sō+i+bap/
 snake-3-cripple (adj.)

3.5. Non-productive palatalization of /t/

This rule palatalizes a *t* occurring after the voiced palatal stop *j*, and does not seem to apply productively in the language:

73. [cor, +ant] → [-ant] / [cor, +ant] ____

One place where rule (73) applies is inside pronouns. The first and second person plural pronouns are formed by the first or second person marker, followed by the third person marker *i*, and the plural suffix *-ta*. The rule of consonantalization discussed in 3.4 changes the high front vowel into a palatal stop in (76) and (78), creating the environment in which rule (73) applies:

74. <i>i+n</i> → <i>in</i>	'1 sg. Pronoun'
75. <i>a+n</i> → <i>an</i>	'2 sg. pronoun'
76. <i>i+i+ta</i> → <i>ijta</i> → <i>ijtʃa</i>	'1 pl. pronoun'
77. <i>i+ta</i> → <i>ita</i>	'1 excl. pronoun'
78. <i>a+i+ta</i> → <i>ajta</i> → <i>ajtʃa</i>	'2 pl. pronoun'
79. <i>i</i>	'3 sg./pl. pronoun'

Although palatalization can also occur between person clitics and the declarative prefix *ta(ka)-*, it is not obligatory in that environment. Verb stems bearing the declarative prefix very often appear prefixed by the person agreement markers *yj-* and *aj-*, without triggering palatalization:

80. <i>y-j-taka-hor-i</i>	<i>y-j-tʃa</i>	'we will leave'
1-pers-decl-leave-irr	1-pers-pl	
81. <i>a-j-taka-ʔō:m</i>	<i>a-j-tʃa</i>	'you were fooled'
2-pers-decl-fool-irr	2-pers-pl	

4. Syllable structure

4.1. Prohibited codas and obligatory onsets

In this section I will examine the principles guiding the formation of syllable structure in Karitiana. Syllables are formed minimally of a simple nucleus (one time slot) and maximally of an onset, a complex nucleus (two time slots, as is the case in long vowels) and a coda. The onset of a syllable has no restrictions as to the quality of the consonants allowed, but codas do not allow any of the following surface segments: *s*, *tʃ*, *r*, *h*, *β*, and *ʔ*. We saw that, having discarded the voiceless palatal stop and the glottal stop as underlying consonants, it is possible to define this class as comprising of the [+continuant] *s*, *r*, *h*, and *β*.

The only consonants that may occur word-internally as codas are nasal:

82.	na.kam.ʔat	'he/she made someone do something (declarative)'
	ñõn.so	'woman'
	koɽ.ti	'pregnant (literally, 'big-belly)'
	ñiŋ.ti	'electric eel'

The generalization that codas must be nasal is evident when a consonant-initial suffix is added to a root, as in (83) and (84): a non-nasal in root-final position triggers epenthesis in (83), whereas a nasal does not (cf. (84)).

83.	bik+pa --> bì .k<ɨ>.pá	'seat, bench'
	to sit-nominalizer	
84.	hõ.rõn+pa --> hõ̃ .rõn.pá	'basin'
	to wash-nominalizer	

These facts suggest that nasals are licensed as codas, and non-nasals are not:

85. Coda well-formedness condition:

$$\begin{array}{c} C] \sigma \\ | \\ [-\text{cont}, +\text{nasal}] \end{array}$$

Another rule that plays a role in syllabification is the obligatory onset condition, given in (86):

86. Obligatory onset condition:
 $C_1VC_2 \rightarrow .C_1V.C_2 / ___ V$

With respect to this rule, nasal and non-nasal stops behave exactly alike: any consonant in C2 position must syllabify as an onset:

87. [[na+[m+a.n^d_{ij}]]+Ø] --> nā.mā.n^d_{ij} 'He made him smile'
decl-caus-laugh-nfut

88. [[pit+oki]+n] --> pi.ro.ki^d_n 'there was'
assert-do-nfut.

In (89) and (90) word-initial onsetless syllables are followed by nasal consonants. In the former the nasal becomes the onset of the following syllable because a vowel is available following the nasal. The alternative syllabification would be VN.V, resulting in two onsetless syllable, which violates (86). In (90), the nasal syllabifies as a coda, because a consonant follows it:

89. i+m^b_{ik<i>j} --> i.m^b_{i.kij} 'he will come'
3-come-fut

90. ān+ta+ok*i*+t → ān.ta.o.k*i*t 'they killed him'
 DOFC-decl-kill-nfut

Rule (86) conforms with the universal tendency against onsetless syllables. Vowel-initial syllables in Karitiana are often in morpheme-initial position as in (91)-(94), where the language has no choice but to syllabify a vowel without an onset, since the vowel is either word-initial, morpheme-initial, or preceded by another vowel. Examples (91) and (92) depict oral vowels in word-initial and word-medial environments respectively, and in (93) and (94) we have the same pattern occurring with nasal vowels:

91. a.k*a*^bm 'now'
92. i+a+k*i*n^da oti+nā → i.a.k*i*.n^da o.ti.^dnā 'he is not sick'
 3-pass-sick
93. ā.m^bi 'house'
94. nā+ā.m^bo → nā.ā.m^bo 'to go up'
 decl-go up

There are very few cases of morpheme internal onsetless syllables, and in all of these cases the onsetless syllable is preceded by an open syllable, as in (96).

95. [[i+i]+p*i* → i*j*.p*i* 'our hands'
 1-3-hand
96. d*ʒ*e.o.kōn 'toucan'

In (95), although there are two contiguous vowels underlyingly, an onsetless syllable is avoided by the application of the consonantalization rule (cf. section 3.4), which changes a high front vowel into a voiced palatal stop between a vowel and a consonant. (96) is

one of the rare occurrences of a monomorphemic word which has an internal onsetless syllable.

Note that an analysis in which stray consonants are allowed to remain word-finally, instead of being deleted, is viable only if we reject the principle of Stray Erasure - a mechanism that automatically deletes unsyllabified segments - proposed by Ito (1989). Polish seems to be an even stronger case than Karitiana against Stray Erasure. According to Gussman (1992), Stray Erasure is not at play in Polish, a language with complex post-vocalic consonant clusters which violate sonority principles. He accounts for these facts by positing a coda condition which is restricted to sonorant segments, and leaves any following consonants unsyllabified. I follow Gussmann, in denying the existence of Stray Erasure as a universal principle of phonology.

A question that immediately comes to mind at this point is: if obstruents are allowed to strand word-finally, why can't they also be left unsyllabified word-medially in environments such as (83)? The answer can be found in the cyclic nature of the phonology: in each stratum, resyllabification takes place. In affixation cases, when a stranded consonant is followed by a consonant-initial suffix, a rule of epenthesis applies, inserting a vowel between the consonants. The stray consonant becomes the onset of the syllable which has an epenthetic nucleus. Word-finally, however, stray consonants are tolerated by the language, because the environment for epenthesis never arises.

4.2. Vowel epenthesis

The rule of epenthesis inserts a vowel between two adjacent underlying consonants. The phonological process of epenthesis is driven by syllabification: in monomorphemic and polymorphemic words, it takes place when, after syllabification, an

obstruent is left stranded between an open syllable and an obstruent. The same conditions that hold word-internally must be present for epenthesis to occur in phonological phrases (compounds, other types of complex heads, clitic-phrase units). In phonological phrases, however, an additional requirement must be met: the presence of a stress clash between the syllables adjacent to the stray consonant.

4.2.1. Morpheme-internal vowel epenthesis

The goal of this section is to describe epenthesis internal to a monomorphemic word. We will examine cases of vowel epenthesis occurring inside a certain class of monomorphemic words which would otherwise have two stray consonants. The epenthetic vowel is inserted between these two stray consonants, licensing the first consonant as its onset:

97. Epenthesis (underived environment)
 $\emptyset \rightarrow V / _ . C _ C$

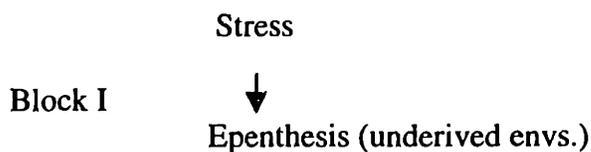
The crucial evidence that supports this hypothesis comes from the patterns of stress in those words. According to the stress patterns of Karitiana, all monomorphemic disyllabic words must bear stress in the last syllable unless the first syllable has a heavy nucleus⁹, as seen in (98a). However, it is clear from the examples in (98b) that not all lexical items can be accounted for straightforwardly by the generalization above. The examples in (98b) seem to be exceptional in that we would expect stress to fall on the last syllable:

⁹ Heavy nuclei in Karitiana are limited to v:. Codas never count as heavy for the purposes of stress.

98.	e.ɣ̃ɣ̃i	'to vomit'	98b.	mā.rām	'fly (n.)'
	si.poj	'tail'		ta.rak	'to walk'
	pi.hop	'to dry'		?ō.rōm	'black monkey'
	so.ʔo:t	'to see'		ho.rop	'long'
	o.ko:t	'again'		gi.rɨj	'earthworm'
	pi:pi:p	'owl'		ba.kap	'hanging'
	i.ri	'açaf palm'		?i.rɨp	'tapir'
	ki.ri	'liver'		ki.rɨk	'mosquito'
	ka.rak	'sleep' (n)		pi.kip	'tree bark'
	ō.wā	'child'		?e.βet	'thin'
	do.kōn	'skunk'		te.rep	'straight'
	sa:ra	'alligator'		hi.ɽɨj	'to sing'
	ke:rep	'in the old days'		ke.rep	'to grow, to raise'

When we compare the class of words in (98a) with those in (98b), it becomes clear that it is not the CV_i.CV_jC shape that determines the exceptional word-initial stress pattern. Words such as *ka.rak* and *do.kōn* in (98a) have the same shape as the class of words in (98b), but their stress falls predictably on the final syllable. Notice that words that do not obey the stress patterns all have something in common: their syllabic nuclei have exactly the same features. One straightforward way of accounting for the data is to posit an epenthetic nucleus in the last syllable of such words, and to define the stress rules at this level as to somehow ignore epenthetic vowels. If epenthetic vowels are not accessible to the computation of stress, then the words in (98b) are not exceptional because stress is predictably assigned to the rightmost syllabic nucleus, that is, the only nucleus in the word before the application of epenthesis:

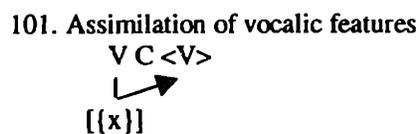
99.



The underlying forms of the words in (98a) and (98b), according to this hypothesis, would be as in (100a) and (100b), respectively:

100a.	/eŋi/	'to vomit'	100b.	/mārm/	'fly (n.)'
	/sipop/	'tail'		/tark/	'to walk'
	/pihop/	'to dry'		/ōrm/	'black monkey'
	/soo:t/	'to see'		/horp/	'long'
	/oko:t/	'again'		/ŋirŋ/	'earthworm'
	/pi:pi:p/	'owl'		/makp/	'hanging'
	/iri/	'açai palm'		/irp/	'tapir'
	/kiri/	'liver'		/kirk/	'mosquito'
	/karak/	'sleep' (n)		/pikp/	'tree bark'
	/ōβā/	'child'		/eβt/	'thin'
	/nokōn/	'skunk'		/terp/	'straight'
	/sa:ra/	'alligator'		/hūrŋ/	'to sing'
	/ke:rep/	'in the old days'		/kerp/	'to grow, to raise'

Epenthesis is understood here as the insertion of a vowel. The specific quality of the vowel in question is given by a different phonological process, represented in (101) that involves spreading of features from left to right, resulting in an assimilation by the epenthetic vowel <v> of all features (the set {x} represented below) from a previous vowel:



The corpus presents us with a puzzle that must be discussed before we formalize the interactions between stress and epenthesis: the great majority of monosyllabic words in which epenthesis occurs have *r* as the onset of the syllable whose nucleus is epenthetic. The near-minimal pair [*ta.rak*] 'to walk' and [*ka.rak*] 'sleep'(n) indicates that it is not possible to argue that *r* is somehow triggering the process of epenthesis. I suggest that a possible account of this phenomenon is to posit two different sources for the

surface *r*: /*t*/ and /*r*/. When epenthesis occurs, it creates the intervocalic environment in which lenition of the obstruent *t* takes place. Words like /*mārām*/, /*itarak*/ and /*ʔōrom*/ therefore, could conceivably have the following underlying forms: /*mātm*/, /*tatk*/ and /*ōtm*/. After the insertion of an epenthetic vowel by rule (97), an environment is created in which the lenition rule (63) applies, deriving the surface forms in (98).

This hypothesis is plausible for two reasons: (i) the glide *w*, which also occurs as the onset of epenthetic vowels in (99b), arguably is a lenited consonant, resulting from the same application of lenition to the underlying obstruent *p*; (ii) we saw in section 3.2. that Karitiana has a rule of lenition (cf. (63)) which applies across affixation, clitic and word boundaries (being optional in the latter environment), leniting a morpheme-final stop intervocalically. The difference between the lenition rule that occurs in underived environments (as in (64)) and the more widespread lenition rule (63), is that the former does not apply to velar stops, while the latter does. This can be explained if the rule of lenition that applies in underived environments must produce segments that are present in the underlying inventory of the language. The continuants *r* and *w*, but not *ɣ* fulfill that requirement. Since lenition and epenthesis are both obligatory in (99b) it is not possible to determine which words have *t* and *p* underlyingly and which ones have *r* and *w*. Because of this indeterminacy, I choose not to represent [-cont] forms in (99b), although we have seen that some of these words must have labial and coronal obstruents underlyingly. A comparative study of cognates in Karitiana and other Tupi languages should enable us to solve that indeterminacy in the future.

To account for the interactions between stress and epenthesis, I assume that stress assignment applies before the process of epenthesis. I adopt the framework of metrical

phonology proposed by Halle and Idsardi (1995) to represent stress. In the remainder of this section and in the next two sections (4.2.2 to 4.2.3), a three-leveled model of cyclic phonology will be presented to account for the interactions between stress, tone, epenthesis and lenition in Karitiana. At this moment, it suffices to say that stress is a process that occurs partially at level I of the phonology, and partially at level II, and that level II affixes are unaffected by level I stress rules precisely because they do not ever undergo level I of the phonology.

Stress in Karitiana is iambic - assigned to the rightmost syllable of a stem. Heavy nuclei (v:) are always stressed, as are a few suffixes, and prefixes never bear stress. All roots undergo level I stress rules independently as roots.

The rules of stress assignment in Karitiana are represented in (102)¹⁰:

102.1. Project nuclei¹¹(In.0)

2. Insert a right parenthesis after nuclei which are heavy.
3. Line 0: LLL, Heads R (level I)
4. Line 1: RRR, Heads R (level II)

103. * line 2 '*alligator*'
 *) line 1
 (*) * line 0
 sa:ra

104. * line 2 '*to see*'
 *) line 1
 (* *) line 0
 so.?o:t

¹⁰ Epenthetic vowels are indicated by angled brackets: <v>.

¹¹ The rules of stress assignment in (102) dictate that underlying nuclei will be projected on a grid, and heavy nuclei (those containing two syllabic time slots, that is, long vowels) will be followed by a right parenthesis. This special marking of heavy nuclei excludes following nuclei from the computation of stress as in (103).

by the underived epenthesis rule, when the word undergoes level II rules the stress rule will ignore the epenthetic vowel, because it only applies to nuclei projected in line 1. Note that that the rule of lenition may apply in (108), because the surface form β could be an underlying p . However, it is never possible to know whether the underlying form is a p or a β , and for that reason I use a question mark in the derivation, to remind the reader of this indeterminacy in underived environments:

108.	morpheme-internal environment: /eβt/	
level I	e.βt	syllabification
	e.βt	stress (line 0)
	?e.βt	epenthesis: glot. stop
	?e.β<e>t	epenthesis underived environment: vowel
	?	lenition underived environment
level II	----	syllabification
	----	stress (line 1)

4.2.2. Vowel Epenthesis Between Stem and affix

When an affix is added to a root, the resulting word is syllabified. We saw in section 4.1 that nasals are the only consonants that may syllabify as codas. Epenthesis between a stem and an affix offer further evidence that [-nasal] stops are stray consonants in word-final position. Below we have examples of deverbal nouns formed by consonant-final verb roots and the inherently stressed suffix *-pa*¹². The way Karitiana syllabification deals with word-internal stray consonants is not deletion, but epenthesis:

109.	kej+pa → kè.y<e>.pá	'shelf'
	to grab-nominalizer	

¹² Secondary stress will be formalized in section 4.2.3.1, when compounds are discussed.

110. **bik+pa** → **bì .k<i>.pá** 'seat, bench'
to sit-nominalizer
111. **pi.hop+pa** → **pi.hò .p<o>.pá** 'drier'
to dry-nominalizer
112. **so.ʔo:t+pa** → **so.ʔò :.t<o>.pá** 'microscope'
to see-nominalizer
113. **ko:kot+pa** → **ko:kot<o>pá** 'bridge'
to pass-nominalizer

Note that epenthesis occurs between a root ending in a [-cont, -nas] consonant and the consonant-initial suffix *-pa*, whereas a root ending in a nasal consonant may be immediately followed by the same suffix in (114)-(115) without triggering epenthesis:

114. **hõ.r<õ>n+pa** --> **hõ̃ .r<õ>n.pá** 'basin'
to wash-nominalizer
115. **ke.ʔõn+pa** --> **ke.ʔõ̃ n.pá** 'fan'
to cool-nominalizer

There are many examples of affixation which corroborate the generalization that the only word-internal codas allowed in the language must be nasal:

116. **na+ka+m+põn+∅** --> **na.kām.põn** 'to make someone fire (sth)'
117. **na+ka+m+tat+∅** --> **na.kām.tat** 'to make someone go'
118. **na+ka+m+ko:kot+∅** --> **na.kām.ko:kot** 'to make someone pass'
119. **na+ka+m+se.ka¹³+t** --> **na.kām.se.kat** 'to make something dry'
120. **na+ka+m+ʔa+t** --> **na.kām.ʔat** 'to make someone do (sth)'

The causative prefix *m-* in the examples above does not trigger epenthesis when the verb root is consonant-initial, while other prefixes which end in a [-nasal] consonant (cf.(121)) do:

¹³ The exceptional stress of this verb is due to its origin: it is a borrowing from Portuguese [seca] 'dries'.

121. pit+?a+n --> pi.r<i>.?a^dn 'there was'
 assert-do-nfut.

It is important to mention that nasal consonants occur as codas word-internally just in case they are followed by a consonant. If a nasal consonant is followed by a vowel instead, the nasal will be syllabified in onset position, as in (122). This is predicted by the resyllabification rule (86) presented in section 4.1:

122. [[na+[m+a.n^dij]]+Ø]--> nã.mã.n^dij 'He made him smile'
 decl-caus-laugh-nfut

The rule of epenthesis applying word-internally in affixation cases is not a level I rule, because it interacts with different stress and lenition rules than the ones present in level I underived environments. Recall that the level I lenition rule affects bilabial and [coronal, +anterior] obstruents exclusively, whereas level II lenition applies to all stops, including nasals. More importantly, the vowel following the lenited consonant in the level II rule must belong to a different morpheme, and cannot be epenthetic, because lenition crucially fails to apply in (109)-(113):

123. Level II epenthesis
 ∅ → V / .C__C

Thus far we have examined the behavior of epenthetic vowels in monomorphemic and polymorphemic word-internal environments. I conclude that in both cases the rules guiding syllabification are triggering epenthesis. Namely, the rule that eliminates [+continuant, -nasal] consonants from coda position, and a rule forcing a prevocalic CVC sequence to syllabify as CV.CV.

4.2.3. Vowel epenthesis inside a complex syntactic head or functional phrase

4.2.3.1. Compounds

Compounds in Karitiana can be defined as complex prosodic constituents formed by either one prosodic word and a bound stem or two prosodic words. Syntactically, they can be described as complex lexical heads whose syntactic head takes another head as a complement:

124.



Although they often involve two separate prosodic words, where level II epenthesis is unexpected, epenthesis *does* take place in compounds. However, the rule applying inside compounds is crucially different from the one applying to words formed by affixation. The condition for epenthesis in compounds is to separate a stress clash by providing a nucleus for an unsyllabified consonant followed by another consonant inside the compound. The goal of this section is to demonstrate that, despite being words, compounds are crucially different from words formed by affixation with respect to epenthesis, patterning instead with larger prosodic units, the phonological phrases, which

will be discussed in section 4.2.3.2. The implementation of this distinction can be captured naturally by the introduction of a third level in the phonology, where the phonological process of epenthesis as stress clash avoidance applies to units larger than words:

125. Level III epenthesis
 $\emptyset \rightarrow V / V.C_ CV$

In (126)-(129), compounds formed by two separate prosodic words are exemplified:

Noun-Noun:

- | | | | |
|------|---------------------------------------|--|---------------------------|
| 126. | ?ip
fish | biʃ → ?i .p<i > bi'ʃ
chief | ‘surubim fish (species)’ |
| 127. | [[kī .n ^d ə pa.só ʃ] ?ep] | → kī .n ^d ə pa.sò y<o> ?é p
jenipapo tree | ‘jenipapo (species) tree’ |
| 128. | pe.tē m | gak → pe.tē m gá k
tree (species) caterpillar | ‘caterpillar (species)’ |
| 129. | ?ep kījūm^hi | → ?è p kījūm^hi
tree root | ‘tree root’ |

Note that the strategies that the language uses to avoid unsyllabified consonants is similar in compounding and affixation: in both environments, for epenthesis to apply, an unsyllabified consonant is needed in morpheme-final position of the first member of the morphological unit. Nasals, as expected, do not resyllabify as onsets in (128), since they are licensed as codas. In compounding, however, epenthesis fails to apply in cases such as (129), where there is no stress clash between the syllables adjacent to the stray consonant, whereas in affixation cases, stress clash is not an issue (cf. (113) **ko:kot<o>pá**).

With respect to stress, level I affixation and compounding behave exactly alike. In both cases, the morphological unit bears primary stress in the stressed syllable of the rightmost morpheme (the level I suffix or the second member of the compound), and secondary stress in the stressed syllable of the leftmost morpheme. Secondary stress in our system should be implemented as a result of the cycle: after each member of a complex morphological unit went through level I, the unit enters the phonology at a level in which stress rules apply to correctly derive primary and secondary stress taking as input the output of the previous cycle. The question is: should compounds and words derived by affixation go through the same steps in the cycle in order to get primary and secondary stress?

The answer to this question, in face of the problem posited by epenthesis in compounds, must be negative. If compounds are made to enter level II in order to undergo the line 1 (RRR,R) stress rule which will derive primary and secondary stress, they will also have to undergo the epenthesis rule present at that level, which, as seen, does not take into consideration stress clash. Therefore, compounds cannot undergo level II epenthesis, or the incorrect result would obtain, namely, epenthesis without a stress clash:

130. *ʔ^e.p<e> k̄i.ŷi.m^bi'

The solution I propose to this problem implements formally some of the descriptive generalizations stated informally in the paragraphs above. I will present my account and exemplify it first, and then proceed to discuss why I discard other alternatives.

First, compounds must undergo a different rule of epenthesis than words formed by affixation, and the two rules must feature in different levels of the cycle. Specifically, they must not enter level II of the phonology. Being larger than prosodic words, compounds pattern as the type of prosodic constituent which goes through level III, so the optimal solution to escaping the epenthesis rule applying to prosodic words should be one in which compounds completely skip level II. The level III epenthesis is formalized below:

Note, however, that by rejecting the idea that all words, including compounds, must go through level II of the phonology, we are radically changing the original notion of what levels stand for. To H&V, each level of rules applies to certain morphosyntactic units: level I is cyclic and applies to those lexical items marked level I themselves, or to words formed by level I affixation, whereas level II applies to every word once, after all passes through the first cycle. According to this theory, all words must enter level II of the cycle, and the notion of excluding compounds from the set of words that must go through level II seems ad hoc. My understanding of which types of units are computed by the phonology is different than H&V's. Levels of rules in my view apply to prosodic constituents, and not to morphosyntactic units. Morphosyntactic units such as words dominated by a categorial node map into prosodic units, and these prosodic units are the only information the phonology considers, that is, levels are reserved exclusively for certain kinds of prosodic constituents. For instance, level II does not apply to units larger than a prosodic word. That is, if a constituent is formed by more than one prosodic word, it cannot go through level II, even if it is a prosodic word itself.

A second property of my account is that compounds must enter level I as a constituent because they are headed by level I roots. The rationale for this approach is an extension of H&V's notion of level I. We saw that in H&V's theory level I applies to those units lexically specified as cyclic. I take that to literally mean that if all roots are cyclic, a constituent grouping two level I roots must be cyclic as well. The main motivation for positing this passage of compounds through level I is stress: to derive a pattern of stress subordination in compounds, it is necessary to have them undergo a level of the phonology where stress rules are operative. Recall that, given our assumptions about epenthesis we cannot posit that compounds go through level II, which leaves us with two other possibilities: level I and level III. The only place where stress rules clearly apply is level I. We will see in section 4.2.3.2 that, with the exception of compounds, constituents undergoing level III rules do not display stress subordination. This leaves us with level I as the only place in the phonology where the stress patterns of compounds could be derived.

Let us now consider whether words formed by level I affixation undergo the same levels in the phonology as compounds do. One might argue that this is expected, since level I suffixes are similar to roots in that they are lexically marked as level I morphemes, and should thus go independently through level I rules and also induce a pass through the cycle of the whole word to which they are suffixed. I argue that this idea cannot be implemented because it either introduces redundancy in our account, or it contradicts the requirement that every minimal prosodic word must go through level II. The redundancy would come from an implementation of the idea in which morphemes which already went through level I independently reenter the cycle as a single unit, because the stress

rules at level I would vacuously apply in all cases. If, instead, we had level I as the only portion of the phonology applying to these constituents, our account would be weakened, because we defined level II as obligatory for all minimal prosodic words, and since words formed by level I affixation do not contain any prosodic words inside them, by definition they should pass through level II. It is indeed possible to differentiate level I affixation from compounding with respect to stress, and still obtain the same pattern of subordination in both cases. The answer to this problem must be that level I affixes and roots have a different status in the lexicon. Specifically, I suggest that level I affixes are inherently stressed, that is, they come into the metrical grid with a right parenthesis to their right, just like long vowels, whereas roots get their stress by going through the cycle independently. In my account, inherently stressed affixes do not go through level I independently, but as a unit with the root. This enables them to get stress at level I, and to undergo stress subordination at level II. In chapter 2, section 1.2, level I affixation is distinguished from level II affixation with respect to stress and tone patterns. Below are some derivations exemplifying our account of compounds:

131.	Compounding: /ip miɲ/		
	i.p	bi.j	syllabification (level I)
	i.p	bi.j	stress (line 0: LLL,R) (level I)
	ʔi.p	bi.j	epenthesis: glot. stop / _ . v (level I)
	----	----	epenthesis: vowel / .c_c (und.) (level I)
	----	----	lenition: p, t → β, r / v. _ v (und.) (level I)
	----	----	syllabification (level II)
	----	----	stress (line 1: RRR,R) (level II)
	----	----	epenthesis: vowel / .c_c (level II)
	----	----	lenition: / v_ [v (level II)
	ʔi.p	bi.j	syllabification (level I)
	ʔi.p	bi'.j	stress (line 0: LLL,R) (level I)
	-----	-----	epenthesis: glot. stop / _ . v (level I)
	-----	-----	epenthesis: vowel / .c_c (und.) (level I)
	-----	-----	lenition: p, t → β, r / v. _ v (und.) (level I)

----		syllabification	(level III)
ʔi.p<i> bi'.j		epenthesis: vowel / v.c__ cv	(level III)
----		lenition: / v_ [v	(level III)

In (131), each member of the compound undergoes the rules at level I and II independently, since each member of the compound is a word. Being formed by two level I roots, the compound then goes through level I of the phonology, where primary stress is assigned to the rightmost stressed nucleus. We saw that whenever a stress clash is present inside a compound, the level III rule of epenthesis as stress clash avoidance applies, inserting a vowel after an unsyllabified consonant followed by an onset.

In (132), epenthesis does not apply because no stress clash configuration arises inside the compound:

132. Compounding: /ep kīyīmi/

e.p		ki.yī.m^bi	syllabification	(level I)
e.p		kī.yī.m^bi	stress (line 0: LLL,R)	(level I)
ʔe.p		kī.yī.m^bi	epenthesis: glot. stop / _ . v	(level I)
----		----	epenthesis: vowel / .c_c (und.)	(level I)
----		----	lenition: p, t → β, r / v. _ v (und.)	(level I)
----		----	syllabification	(level II)
----		----	stress (line 1: RRR,R)	(level II)
----		----	epenthesis: vowel / .c_c	(level II)
----		----	lenition: / v_ [v	(level II)
ʔe.p		kī.yī.m^bi	syllabification	(level I)
ʔ`e.p		kī.yī.m^bi	stress (line 0: LLL,R)	(level I)
----		----	epenthesis: glot. stop / _ . v	(level I)
----		----	epenthesis: vowel / .c_c (und.)	(level I)
----		----	lenition: p, t → β, r / v. _ v (und.)	(level I)
----		----	syllabification	(level III)
----		----	epenthesis: vowel / v.c__ cv	(level III)
----		----	lenition: / v_ [v	(level III)

In (133), syllabification at level I results in a well-formed compound, that is, one in which no consonant is left unsyllabified word-medially. Therefore, no environment is created in which epenthesis could apply, and the stress clash is tolerated:

133. Compounding: /petēm ŋak/

pe.tēm	ga.k	syllabification	(level I)
pe.tēm	ga.k	stress (line 0: LLL,R)	(level I)
----	----	epenthesis: glot. stop / _ . v	(level I)
----	----	epenthesis: vowel / .c_c (und.)	(level I)
----	----	lenition: p, t → β, r / v. _ v (und.)	(level I)
----	----		
----	----	syllabification	(level II)
----	----	stress (line 1: RRR,R)	(level II)
----	----	epenthesis: vowel / .c_c	(level II)
----	----	lenition: / v_ [v	(level II)
pe.tēm	ga.k	syllabification	(level I)
pe.tēm	ga.k	stress (line 0: LLL,R)	(level I)
----	----	epenthesis: glot. stop / _ . v	(level I)
----	----	epenthesis: vowel / .c_c (und.)	(level I)
----	----	lenition: p, t → β, r / v. _ v (und.)	(level I)
----	----		
----	----	syllabification	(level III)
----	----	epenthesis: vowel / v.c__ cv	(level III)
----	----	lenition: / v_ [v	(level III)

At this point I interrupt the exposition of compounding to discuss some alternatives to the solution I adopted. First, I will consider an account in which the rule of epenthesis applying to affixation and the one applying to compounds is formalized as one and the same level II rule (stated with a disjunctive environment so that the right results will obtain). I reject this account because it is unnecessarily complicated and stipulative. The first obvious disadvantage it has is a disjunctive rule, and the second is a built in redundancy. The redundancy comes from the fact that in such an account we would still need another rule of epenthesis as stress clash avoidance applying at level II, because: (I) constituents larger than words cannot go through level II in H&V's theory;

(ii) even if they did, the wrong result would obtain: phonological phrases would be subject to stress subordination.

Another possibility which I discard is to have two separate epenthesis rules at levels II and III, and to make compounds undergo levels II and III. This would be stipulative and redundant: the rule of epenthesis at level II would have to be stated in a way as to exclude compounds from its environment, since the rule of epenthesis applying to them is the one at level III, which is needed independently of compounds.

Now I resume the exposition on compounding, discussing the forms in (134)-(138) which are prosodic words formed by a prosodic word and a bound root. As far as data is available, the syntactic heads of such compounds (*-sap*, *-po*, *-se*) are the bound roots in all cases:

Noun-Noun stem:

134.	?ep +sap → ?è .p<e>.sá p tree-leaf.like.object	'tree leaf'
135.	?ej +po → ?è .y<e>.pó soil-seed.like.object	'stone'
136.	?e:t+se → ?è :.t<e>.sé bee-liquid.like	'honey'
137.	nōm+se → nōm.sé breast-liquid.like	'breast milk'
138.	pi.kip+se → pi.kip.sé bark-liquid.like	'bark liquid'

The compound in (138), whose derivation is represented in (139), is independent evidence that stress rules operate in two levels. The vowel that prevents the stress clash configuration at level III is an epenthetic vowel, inserted at level I (underived environment). Because the epenthetic vowel in (138) is not outside of the environment of

level III stress rules as it is in morpheme internal epenthesis cases (cf. (98b), we know that the stress rules operating inside compounds at the level III are different than the ones at level I:

139. Compounding: /pikp -se/

pi.kp	-se	syllabification	(level I)
p̄i.kp	-se	stress (line 0: LLL,R)	(level I)
----	----	epenthesis: glot. stop / _ . v	(level I)
p̄i.kip	-se	epenthesis: vowel / .c_c (und.)	(level I)
----	----	lenition: p, t → β, r / v. _ v (und.)	(level I)
----	----	syllabification	(level II)
----	----	stress (line 1: RRR,R)	(level II)
----	----	epenthesis: vowel / .c_c	(level II)
----	----	lenition: / v_ [v	(level II)
p̄i.ki.p.se		syllabification	(level I)
p̄i.ki.p.sé		stress (line 0: LLL,R)	(level I)
----	----	epenthesis: glot. stop / _ . v	(level I)
----	----	epenthesis: vowel / .c_c (und.)	(level I)
----	----	lenition: p, t → β, r / v. _ v (und.)	(level I)
----	----	syllabification	(level III)
----	----	epenthesis: vowel / v.c__ cv	(level III)
----	----	lenition: / v_ [v	(level III)

Now we must explain the parallel phonological behavior of (132) and (139) with respect to epenthesis as being independent from the difference in their phonological constituency. (132) is a compound formed by two separate phonological words, whereas in (139) the leftmost member of the compound is a prosodic word, and the rightmost member is a bound root. Morphosyntactically, (139) seems to be exactly parallel to the affixation cases in (109)-(113), because in both cases the result is a compound. Internally, however, they are very different, since (139) involves one prosodic word and a bound root. The explanation I suggest for this phenomenon relies in our three-leveled

phonological system. A compound, being a complex level I unit, undergoes level I of the phonology. However, being formed by at least one prosodic word, it undergoes level III as well:

140.

<u>Phonology</u>	<u>Phonological units</u>	<u>Morphological units</u>
Level I	prosodic word (Pwd)	roots, level I suffixes
Level II	at most one Pwd	all words, only once
Level III	larger than Pwd	compounds, clitic-host units

Finally, a note about stress clash. The facts indicate that a stress clash between the first and the second members of a compound is not always avoided by epenthesis. An explanation for this phenomenon is immediately available in our derivational system, where level III epenthesis requires a stray consonant and a stress clash. Predictably, a configuration in which no consonant is left unsyllabified (cf. (141)) will not be subject to epenthesis and will allow a stress clash to surface:

141.	mī j̃õ	ʔé p	'Brazil nut tree'
	Brazil-nut	tree	

We will see in Chapter 2 that Karitiana has other rules applying at level III: a rule of low tone insertion (henceforth L-insertion) applying in stress clash environments, and a rule of destressing in certain syntactic environments.

In the remainder of this section we shall account for one real and one apparent set of exceptions to our account of compounding. First, note that the corpus contains (142),

which should have an epenthetic vowel. The occurrence of (143), however, indicates that regular epenthesis indeed occurs in that environment:

- | | | |
|------|--|------------------------|
| 142. | ʔep+ʔo --> ʔep. ʔó
tree-round object or fruit | ‘pama fruit (species)’ |
| 143. | ʔep+ʔo --> ʔe.p<e>.ʔó
tree-fruit | ‘fruit of the tree’ |

It is possible that the exceptional form is a lexicalized old compound, whose internal structure is no longer recoverable. Other similar exceptions exist, all of which have a glottal stop as the onset of the second word: *otʔep* ‘bow’, *otʔoop* ‘bamboo’, *otʔyyp* ‘bowl’.

Recall that, according to our analysis, glottal stops are epenthesized as onsets of stressed syllables at level I. The presence of a glottal stop as the initial consonant of the second member of the compound in all exceptional forms, suggests that these lexicalized forms may date back from a time in which glottal stops were part of the underlying inventory of the language. I assume these words are not productive compounds, but “frozen” forms, with idiosyncratic meaning.

A second class of apparent exceptions can be seen in (144)-(146), which at first sight are compounds and thus should be expected to behave as other compounds do. These compounds allow consonants to cluster in neighboring syllables, while in examples (126) and (127) above, the same type of clusters trigger epenthesis:

Noun- Adjective:

- | | | |
|------|---|------------------------|
| 144. | ʔip pok --> ʔip pok
fish white | ‘white fish (species)’ |
| 145. | bi:p sōm --> bi:p sōm
turtle red | ‘red turtle (species)’ |

146. $\text{ʔeɟ} [\text{bit}+\text{nā}] \rightarrow \text{ʔeɟ bi}^{\text{d}}\text{nā}$ 'clay pan'
 soil pan-adjectivizer

If the examples above were compounds, we would expect epenthesis to occur between N and A whenever consonant clusters were created, and this prediction is not corroborated (compare *bi:p sōm* in (145) and *ʔe.p<e>.sap* in (134)). As far as I can see, there seems to be one explanation for this fact. We could analyze examples (126) and (127) as compounds, and the ones in (144)-(146) as relative clauses¹⁴. As we will see below, there is independent evidence for this hypothesis.

An interesting piece of phonological evidence supports the hypothesis that the units in question are not compounds: a unit formed by a noun and an adjective (or adjective stem) is not a prosodic unit of the same type that compounds are, because it does not have primary and secondary stress, as compounds do. Instead, in the examples (144)-(146), each word has primary stress. I claim that these examples fail to undergo compound stress subordination and epenthesis because they are clauses and do not go through level I of the phonology as a unit.

There is some syntactic evidence to confirm the hypothesis that the constituents formed by a noun plus an adjective are clauses in Karitiana: (i) the language is head-final (cf. chapter 3) and the head of compounds are all in accordance with this parameter (for instance, in (134), a tree leaf is a kind of leaf), while the noun-adjective combinations in (144)-(146) are head-initial (for instance, in (145), a red turtle is a kind of turtle); this mismatch can be explained if the latter are relative clauses headed by the noun (ii) the examples in (144)-(146), as well as relative clauses, distribute as NPs; (iii) all

¹⁴ This proposal was inspired by Green's (1992) analysis of covert clause structure in Miskitu.

occurrences of noun-adjective combinations in Karitiana are ambiguous between a relative clause reading and a simple NP reading (chapter 3); (iv) adjective roots distribute in the same way as verb roots do in the language.

If I am correct in analyzing all noun-adjective combinations as relative clauses, then an explanation for the lack of epenthesis in (144)-(146) is immediately available: the adjectival predicate and the head of a relative clause are too far apart in the syntax to be mapped in the phonology as a level III prosodic unit, because two maximal projections (the subordinate clause AspP and AP) intervene between them. The structure of adjectival relative clauses is represented in (147). The operator (Op) of the relative raises to the specifier of the clause, and is coindexed with the external head of the relative:

147.

$NP_i \text{ AspP} [Op_i \text{ AP} [t_i \text{ A}]]$

In section 4.2.3.2, the syntactic and phonological nature of level III prosodic units will be discussed. We will see that certain morphosyntactic configurations map into prosodic units larger than a prosodic word (phonological phrases), which enter the phonology as units at level III. Although noun-adjective phrases do not qualify as phonological phrases, they do qualify as even larger prosodic units, the intonational phrases, which enter the phonology at level IV. That will become clear in chapter 2, where we discuss pitch accent rules.

4.2.3.2. Phonological phrases

When examining the phonological behavior of compounds, we saw that epenthesis may occur inside prosodic constituents formed by more than one prosodic word. In this section, I will show that clitics and the lexical item that hosts them behave, in that respect, exactly in the same way as compounds. The only difference between compounding and cliticization is stress: compounds undergo a level II rule of stress that clitics and their hosts do not. By virtue of consisting of units larger than words, the latter do not enter level II of the phonology as a unit, but instead, undergo level III rules exclusively.

The clitics which form a prosodic unit with the lexical item that hosts them are: the negation word *padni*, the postposition *piri* 'through', and an empty determiner heading a possessive phrase.

Verb and negation together form a prosodic constituent in which resyllabification takes place in (148)-(150), creating an environment for epenthesis. As is the case in compounding, the motivation for epenthesis here is syllabification and stress clash:

[- sonorant]-final verb stems:

148.	i+so.ʔo:t 3-see	pa ^d n+ī neg	--> i.so.ʔo:t<o> (pa. ^d nī)	'He/she didn't see'
149.	i+pik 3-run	pa. ^d nī neg	--> i.pi.k<i> (pa. ^d nī)	'He/she didn't run'
150.	i+pop 3-die	pa. ^d nī neg	--> i.po.p<o> (pa. ^d nī)	'He/she didn't die'

In (151)-(153), verbs ending in nasal consonants or vowels, as expected, do not require epenthesis, because the requirement for the application of the rule (/C__C) is not met.

[+ sonorant]-final verb stems:

- | | | | |
|------|--|---|-------------------------------|
| 151. | i+a+o.ki
3-pass-kill | pa. ^d nĩ --> i.a.o.ki (pa. ^d nĩ)
kill | 'He/she wasn't killed' |
| 152. | i+a+ki
3-pass-live | pa. ^d n+oko --> i.a.ki (pa. ^d no.ko)
neg-iterat. | 'He/she was no longer living' |
| 153. | i+o ^g ŋōm ¹⁵
3-work | pa. ^d nĩ --> i. o.ŋōm (pa. ^d nĩ)
neg | 'He/she didn't work' |

Another syntactic environment in which level III epenthesis occurs is after a possessor in a possessive phrase:

- | | | |
|------|--|---|
| 154. | i+sip+ti --> i.si.p<i>.ti | 'My father's mother (woman speaking)' |
| 155. | i+sip tāŋ --> i.sip<i>. tāŋ | 'My father's knife' |
| 156. | [[i+sip tāŋ] ?op] --> y.sy.p<y> tāŋ ?op | 'The handle of my father's knife' |
| 157. | [[ta.so hyk] ha. ^d n+a] --> ta.so hy.k<y> ha. ^d na | 'The men's old stories' |
| 158. | i.haʃ | 'My (younger) brother' (man speaking)' |
| 159. | i.ha.y<a >?it | 'My brother's son' |
| 160. | [[i.ha.ya.ʔi.t<i>] pō.wōm] ¹⁶ | 'My brother's son's doll' |
| 161. | [[[i.ha.ya ʔi.t<i>] pō.wōm] o.sop] | 'The hair of my brother's son's doll' |
| 162. | [[[[i.ha.ya ʔi.t<i>] pō.wōm] o.so.p<o>] pi] | 'The ends of the hair of my brother's son's doll' |

One could alternatively hypothesize that what really occurs in negated verbs and possessive constructions is the suffixation of a morpheme (an unspecified vowel) to the first element in the unit (the verb in the former and the possessor in the latter) to indicate that it is in a certain grammatical relation with the second element in the unit (the possessed object and the negation word). However, we have independent evidence to

¹⁵ Stress is initial in this word because it is bimorphemic: ?oŋ+Vm

support the analysis that the epenthetic vowels are not suffixes in the relevant examples. If they were, the process of lenition should take place, weakening the obstruent in stem-final position before the hypothetical suffix in (148)-(150), (146)-(149) and (159)-(162).

Examples (163)-(165) show imperatives, formed by the suffixation of *-a*, which triggers the lenition of a preceding consonant. The comparison between this type of regular suffixation and epenthesis is useful here to show that although vowel-initial suffixes trigger lenition, epenthesis alone does not as we saw in (109)-(113) above:

- | | | |
|------|---|---------|
| 163. | a+taktak ¹⁷ +a --> a.tak.ta.ɣa | 'swim!' |
| 164. | a+tat+a --> a.ta.ra | 'go!' |
| 165. | a+hi.r<i>p+a --> a.hi.r<i>.wa | 'cry!' |

Now we examine vowel insertion in postpositional phrases. Examples (166)-(169) and (173) depict postpositions which are bound forms, and thus form a prosodic word with the roots to which they associate, whereas in (170)-(172) involve the postposition *piri*, which has its own stress:

- | | | |
|------|--|-----------------------------|
| 166. | i+ʔit+sok --> i.ʔi.t<i>.sok | 'with my son' |
| 167. | gok+kīn --> go.k<o>.kīn | 'after the yam' |
| 168. | [ɲōn.so pi.sip]+kīn --> ɲōn.so pi.s<i>.kīn | 'after the fat woman' |
| 169. | [ɲōn.so harāɲ]+kīn --> ɲōn.so ha.rāɲ.kīn | 'after the beautiful woman' |

¹⁶ Stress is initial in this word because it is bimorphemic: *pōm*+*Vm*

¹⁷ One class of words which does not seem to conform to the generalization that word-medial obstruents cannot cluster with other consonants are reduplicated forms:

- | | | |
|----|---------|-------------------------|
| a. | kij.kij | 'to tickle/ ticklish' |
| b. | sip.sip | 'to stick/ muddy' |
| c. | pāŋ.pāŋ | 'to thunder/thunderous' |

These cases do not seem problematic to me for the following reason: Their very nature as reduplicated forms. Onomatopoeic words must always undergo *complete* reduplication in Karitiana, and it makes sense to imagine that the insertion of a vowel between the base and the reduplicant would break their symmetry, which is independently given by the fact that they are complete reduplicants. One way to derive the correct results in our system would be to characterize reduplicants as proclitics. Not being roots, they escape level I, and not being affixes, they escape level II. The unit enters the phonology at level III, and the absence of stress clash accounts for the absence of epenthesis.

- | | | |
|------|-----------------------------------|-------------------------------|
| 170. | [o.pok][pit+i] --> o.po.k<o> piri | 'through the white man' |
| 171. | [nõn.so hã.rãŋ][piri] | 'through the beautiful woman' |
| 172. | [i.ʔi.t<i>] [piri] | 'through my son' |
| 173. | [i+ʔ it]+ty --> y.ʔi.t<i>.ti | 'my father - oblique marker' |

The solution I propose to account for the phonological status of level III units is inspired by Selkirk's (1995) suggestion that functional words, due to their inherent prosodic dependency (observed typologically), are always prosodized into a unit with an adjacent lexical word:

"... a function word (Fnc) may be prosodized either as a PWd or as one of three different types of prosodic clitics. The term prosodic clitic will be taken to stand for a morphosyntactic word which is not itself a PWd. It will be argued that options in the surface prosodization of function words simply reflect the manner in which function words are organized into prosodic words in the sentence Corresponding to a syntactic phrase [Fnc Lex], for example, four different organizations into prosodic word are in principle available"

(Selkirk (1995), pg. 440)

174. The prosodic structure of function words

Surface structure:	[Fnc Lex]	
Prosodic Structure:	(i)	((fnc) _{PWd} (lex) _{PWd}) _{PPh} <i>Prosodic Word</i>
		<i>Prosodic Clitics</i>
	(ii)	(fnc (lex) _{PWd}) _{PPh} free clitic
	(iii)	((fnc lex) _{PWd}) _{PPh} internal clitic
	(i)	((fnc (lex) _{PWd}) _{PWd}) _{PPh} affixal clitic

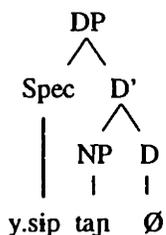
(Selkirk (1995), pg. 441)

Although I adopt Selkirks's idea that morphosyntactic structures map into prosodic units such as prosodic word (PWd) and phonological phrase (PPh), I do not accept her claim (pg. 441) that a constraint-based theory is more adequate than a derivational theory in accounting for the various ways in which phonological processes

affect prosodic structures. I shall incorporate the notion of prosodic structure in my cyclic account of Karitiana phonology by reserving specific cycles to phonological rules affecting a certain prosodic structure. We saw in (140) that the rules affecting morphosyntactic units resulting from affixation operate at level II of the phonology. This level is reserved for the prosodic unit PwD. Compounds and the clitic-host units discussed in this section are larger than prosodic words, and map instead into PPhs, which are affected by level III of the phonology. We will see below that some of the clitics appearing inside phonological phrases in Karitiana are prosodic words themselves (cf. type (i) in (174)), whereas others are affixal (type (iii) or (iv) in (174))¹⁸.

According to Selkirk, a functional word which bears stress is “strong” and must itself constitute a prosodic word. In its functional interdependence with a lexical word, however, it may form a higher prosodic unit, the phonological phrase (cf. (i) in (174)). Therefore, prosodic words such as the negation head *pa^dni*, and the postposition *piri* are “strong” functional heads, which form a phonological phrase with an adjacent lexical item inside their projection. In Karitiana, the syntactic structures which map into phonological phrases are possessive Determiner Phrases (DPs)¹⁹, Postpositional Phrases (PPs) and Negation Phrases (NegPs):

175.

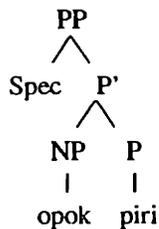


Ex: (155)

¹⁸ Between the two, type (iv) is the most common case, occurring between an affixal postposition and its complement noun. A structure of type (iii) arises, for instance, when the bound negation root *padn-* hosts the irrealis suffix *-i*.

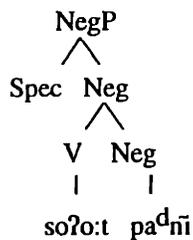
¹⁹ Other determiners, such as demonstratives, are not discussed in this section because they are vowel-initial and in that environment epenthesis does not apply.

176.



Ex: (170)

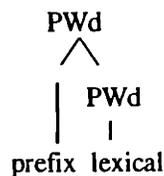
177.



Ex: (148)

The prosodic units where epenthesis applies are represented in (178)-(183):

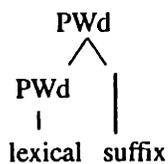
178.



Ex.: **pir<i>-ʔa-^dn**
 assert-to do-nfut

'there is/was'

179.

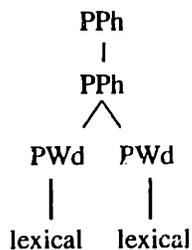


Ex.: **kò :kot<o>-pá**
 to pass+nominalizer

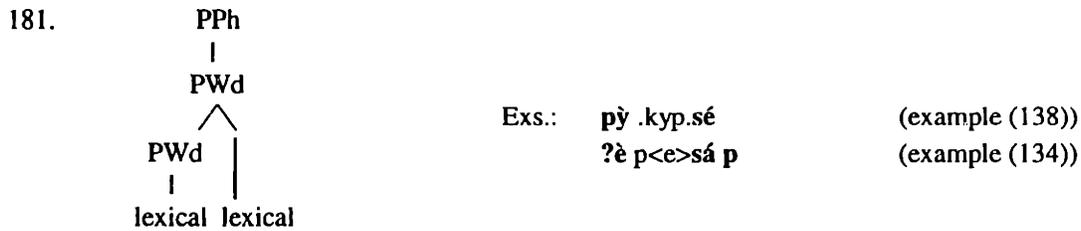
'bridge'

Affix-lexical item combinations are represented in (178) and (179) as forming a prosodic unit: the prosodic word. In our system, they undergo level II of the phonology:

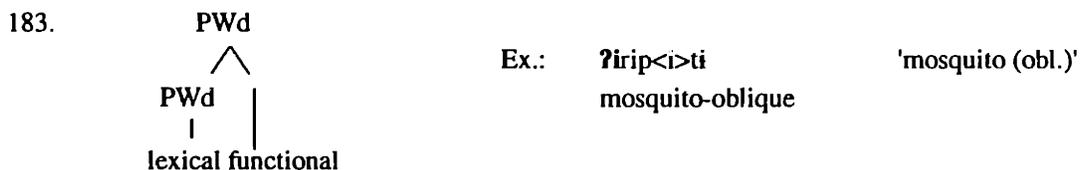
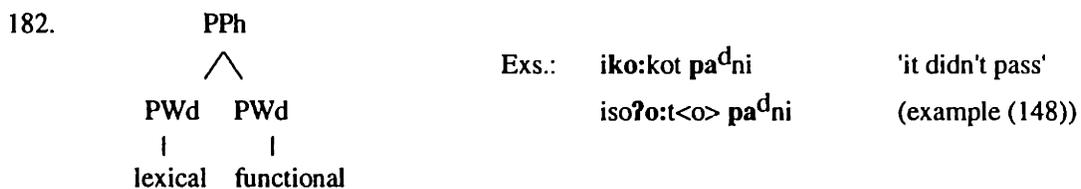
180.



Exs: **?i .p<i > biʔ** (example (126))
?è .p kī.ŋĩ.m^bi (example (129))
y.sy.p<y> taŋ (example (155))



Compounds comprised of two prosodic words are represented in (180), and those formed by one prosodic word and a bound root are represented in (181). We saw that, although compounds are heads in the syntax, they are treated by the phonology as having a dual status, patterning with prosodic words with respect to stress and with phonological phrases with respect to epenthesis. We accounted for these facts by hypothesizing that they undergo the rules at level I and III.



Other phonological phrases can be seen in (182) and (183): the former is the structure for verb-negation, NP-strong clitic combinations, and possessive constructions. Bound postpositions behave like affixes, and thus have the structure in (183), which is parallel to (179). The syntactic class of postpositions, then, is divided between suffixes, which are level II morphemes (cf.(184)), and clitics, which undergo level III as a unit with their hosts (cf. (185)). Being prosodic words, the structures in (178), (179) and (183)

undergo level II rules, while all other prosodic units represented above (compounds and clitics) go through level III:

184.	Affixation: /irp -ti/ tapir oblique		
	i.rp	syllabification	(level I)
	i.rp	stress (line 0: LLL,R)	(level I)
	?i.rp	epenthesis: glot. stop / _ . v	(level I)
	?i.r<i>p	epenthesis: vowel / .c_c (und.)	(level I)
	?	lenition: p, t → β, r/ v._v (und.)	(level I)
	?i.r.i.p.ti	syllabification	(level II)
	----	stress (line1: RRR,R)	(level II)
	?i.r.i.p<i>.ti	epenthesis: vowel / .c_c	(level II)
	?i.r.i.β<i>.ti	lenition: / v_ [v	(level II)

Derivation (185) represents the structure in (182): the noun *ijʔit* forms a phonological phrase with the postposition *piri*: Being a “strong” postposition, *pit* is lexically marked level I, and thus gets its own stress at the cyclic block. It goes through level II of the phonology as a unit with the suffix *-i*, where lenition takes place, deriving *piri*. The noun *ijʔit* is formed by the first person clitic *ij-* and the noun *ʔit*. The latter goes through level II of the phonology by itself. Being a clitic-host unit, *ijʔit* goes through level III of the phonology, where epenthesis does not apply for a lack of stress clash²⁰. The noun-postposition unit goes through the phonology at level III, where it is subject to syllabification and epenthesis.

²⁰ Note that if the person marker were a prefix, level II rules would apply to the word, and an apenthetic vowel would be inserted between the clustering consonants.

185. Cliticization: /{ij it} [pit-i]/

i.t	pi.t	syllabification	(level I)
i̇.t	pi̇.t	stress (line 0: LLL,R)	(level I)
ʔi̇.t	----	epenthesis: glot. stop / _ . v	(level I)
----	----	epenthesis: vowel / .c_c (und.)	(level I)
----	----	lenition: p, t → β, r / v._v (und.)	(level I)
----	pi̇.ti	syllabification	(level II)
----	----	stress (line 1: RRR,R)	(level II)
----	----	epenthesis: vowel / .c_c	(level II)
----	pi̇.ti	lenition: / v_ [v	(level II)
i.j.ʔi.t		syllabification	(level III)
----		epenthesis: vowel / v.c_ cv	(level III)
----		lenition: / v_ [v	(level III)
i.j.ʔi.t pi̇.ti		syllabification	(level III)
i.j.ʔi̇.t<i> pi̇.ti		epenthesis: vowel / v.c_ cv	(level III)
-----		lenition: / v_ [v	(level III)

The negation word is also a clitic, forming a phonological phrase with the verb, which goes through level III of the phonology:

186. Cliticization: /{i- soo:t} pan-i/

so.o:t	pa ^d n	syllabification	(level I)
so.ȯ:t	pȧ^dn	stress (line 0: LLL,R)	(level I)
so.ʔȯ:t	----	epenthesis: glot. stop / _ . v	(level I)
----	----	epenthesis: vowel / .c_c (und.)	(level I)
----	----	lenition: p, t → β, r / v._v (und.)	(level I)
----	pȧ.^dn̄	syllabification	(level II)
----	----	stress (line 1: RRR,R)	(level II)
----	----	epenthesis: vowel / .c_c	(level II)
----	----	lenition: / v_ [v	(level II)
-----		syllabification	(level III)
i.so.ʔȯ:t<o> pȧ.^dn̄		epenthesis: vowel / v.c_ cv	(level III)
-----		lenition: / v_ [v	(level III)

The negation phrase in (187) has exactly the same morphosyntactic structure as the one in (186). However, epenthesis does not apply in the former, for lack of a stress clash:

187. Cliticization: /[-ko:kot] pan-i/

ko:.ko.t	pa ^d n	syllabification	(level I)
ko:.ko.t	pá ^d n	stress (line 0: LLL,R)	(level I)
----	----	epenthesis: glot. stop / _ . v	(level I)
----	----	epenthesis: vowel / .c_c (und.)	(level I)
----	----	lenition: p, t → β, r / v_ .v (und.)	(level I)
----	pá . ^d nī	syllabification	(level II)
----	----	stress (line 1: RRR,R)	(level II)
----	----	epenthesis: vowel / .c_c	(level II)
----	----	lenition: / v_ [v	(level II)
i.ko:.ko.t		syllabification	(level III)
----		epenthesis: vowel / v.c_ cv	(level III)
----		lenition: / v_ [v	(level III)
i.ko:ko.t	pa. ^d nī	syllabification	(level III)
-----		epenthesis: vowel / v.c_ cv	(level III)
-----		lenition: / v_ [v	(level III)

The behavior of evidential and aspect heads confirms our analysis. Like the negation word *pa^dni*, these “strong” functional heads are stress bearing clitics.

188.	nā+ka+?a+t	sarít	i+?it	'My father said (they say)'
	decl.-aug-say-nfut	evid.	1s-father	
189.	nāka+?a+t	ta?āt	i+?it	'My father said (I know)'
	decl.-say-nfut	evid.	1s-father	
190.	Morā+mōn	i+hry<i>p	ti-ka	'Who is crying?'
	wh-cop	part-cry	impfve-motion	

Examples (188)-(190) show that epenthesis does not occur between a verb and aspect or evidential particles. Note that, the “strong” prosodic words which condition epenthesis in our corpus are stress-initial (*pa^dni*, *piri*), and the ones that do not are stress-final (*sarít*,

taʔāt, tika). Since most verbs are stressed in the last syllable, stress clash configurations arise with the former but not with the latter. I conclude that the verb-aspect units in (188)-(190) do not trigger level III epenthesis because there is never a stress clash between verbs and aspectual or evidential heads.

CHAPTER 2 - PHONOLOGY II: PITCH ACCENT SYSTEM

0. Introduction

Karitiana has a pitch accent system which assigns tone based on stress. To account for stress and tone patterns, I adopt the metrical stress theory proposed by Halle and Idsardi (1994). After stress applies, a few tone assignment rules associate tonal melodies to certain stress prominent positions on the grid. Therefore, tone assignment processes in Karitiana need not make use of any additional theoretical machinery other than that already posited to account for stress patterns.

1. Stress

1.1. Halle and Idsardi's metrical grid theory and the stress of roots

A basic underlying assumption of Halle and Idsardi's (henceforth H&I) theory is that stress is an autosegmental phenomenon, computed on a plane that is separate and independent from segments, which they call the metrical plane. Languages differ with respect to the phonemes that are stressable. E.g., Indonesian does not project "weak" vocalic nuclei, such as schwa. Other languages project all vocalic nuclei. This fact is reflected in H&I's theory by projecting only stressable phonemes into the metrical plane.

The metrical plane is represented as a set of lines of asterisks associated with a string of phonemes. Example (1) illustrates the projection into line 0 of the grid of the Karitiana noun *boroja*²²:

- 1.
- | | | |
|--------|--------|----------------|
| * * * | line 0 | <i>'snake'</i> |
| | | |
| boroja | | |

All underlying syllabic nuclei in (1) are projected in line 0 of the metrical grid, as asterisks. Rules apply to line 0, creating feet, whose heads are candidates for bearing stress. The feet are the main prosodic units in the computation of stress. In this respect, H&I implement formally Liberman's (1975) idea of defining stress not as a phonological feature, but as a reflex of groupings of stress bearing elements.

The grouping of asterisks into feet in this system is notated by the use of parentheses. We saw in chapter 1, that a left parenthesis inserted to the left of the leftmost asterisk (LLL) in line 0, groups all asterisks to its right into a foot. This assignment of parentheses at the edges of each grid line, called the Edge Rule, is one of the most important foot-formation rules in H&I's system²³. Head Marking rules, which apply to each line of the grid, assign head status to an edgemost asterisk inside each foot:

2. Rules: Line 0: Edge LLL, Head R
 Line 1: Edge RRR, Head R

²² In sections 1 and 2 of chapter 2, and in all subsequent chapters, examples are represented orthographically. For a justification of the orthography, see Storto (1995). The symbol *y* stands for the high central vowel *i*, the symbol *j* stands for oral allophones of an underlying palato-nasal. Bold syllables represent stress, and long vowels are marked by a colon (*v:*).

²³ Another process that applies cross-linguistically to create feet is the Iterative Constituent Construction rule (ICC), which is not operative in Karitiana.

3. * line 2
 *) line 1
 (* * * line 0
 boroja

In Karitiana, line 0 feet are right-headed. All the heads of the feet from line 0 are then projected into line 1. The Edge Rule applying in line 1 is RRR²³, and the Head Marking Rule of line 1 assigns head status to the rightmost asterisk in a foot, causing those heads to project to line 2. The rules are represented in (2), and example (3) illustrates the complete grid of the projection in (1).

Note that a RRR Edge Rule in line 0 would foot all the asterisks to the left of the rightmost asterisk, delimiting the same foot as the LLL Edge Rule did in (3). It is nonetheless possible to determine, when more complex examples are examined, that LLL and not RRR is the correct Edge Rule parameter operating in line 0. Example (5), for instance, would incorrectly be predicted to have final stress if the line 0 Edge Rule were RRR:

4. Rule: Insert a right parenthesis after a heavy syllabic nucleus (line 0)
5. * line 2 *'alligator'*
 *) line 1
 (*) * line 0
 sa:ra

Because long nuclei (v:) are stressed in Karitiana, the presence of a long vowel in word-initial position in a disyllabic word such as (5) is enough to trigger word-initial stress. H&I suggest that languages which stress heavy syllables have a line 0 rule inserting a

²³ Note that, although LLL, R would give us the same results, RRR,R is chosen by virtue of being more homogenous (cf. H&I).

parenthesis next to the asterisk representing those syllables, in a position that would force such units to be selected as heads. Rule (4) will create a foot to the left of the heavy syllable, thus excluding the possibility of final stress, because when the line 0 stress rule applies the Edge rule is LLL, which will leave the last nucleus in (5) unfooted. If a RRR Edge Rule applied instead in line 0, two feet would be built in that line, incorrectly yielding final stress as in the unattested (6):

6. * * line 2
 * *) line 1
 *) *) line 0
 sa:ra

The use of a single parenthesis to delimit a foot was first proposed by Idsardi (1992), as a departure from theories of metrical stress such as Halle and Vergnaud (1987), which require a matched pair of parenthesis instead. We saw that Karitiana feet are unbounded and right headed, because stress in monomorphemic words is always final in the absence of heavy nuclei, no matter how many stress bearing units are contained in a foot. However, in the presence of heavy nuclei, stress may fail to be final, as shown in (5). This tension between the prescribed nature of final stress and the prominence of heavy syllables is naturally accounted for within a grid theory that makes use of single parentheses. In a theory in which the unbounded foot created in line 0 is demarcated by a pair of parentheses, the last syllable in (5) would be considered part of the line 0 foot, which is incorrect. Everything else being equal, when compared to Idsardi (1992), such a theory would have to say something extra to account for why the last syllable in (5) does not participate in the computation of stress.

exclusively in the first stratum of the phonology, while the line 1 rule RRR,R applies at level II:

9. Level I: LLL, heads R

* line 2
 * line 1
 (* line 0
 ?et

→

Level II: line 1: RRR, heads R

* line 2
 *) line 1
 (* * line 0
 ?e.dna

Class II affixes never undergo level I rules because they are non-cyclic. The example in (8) is a derived word formed by the noun root *?et* ‘child’, and the class II adjectivizer suffix *-na*. Note that although the nucleus of the suffix projects in line 0, the level II stress rule fails to compute it, since it only “sees” line 1 nuclei.

In (10) the word goes through level I of the phonology, where the line 0 rule stresses the suffix, which is inserted at line 0 with a right parenthesis to its right. A subsequent passage through level II results in stress subordination, where primary stress falls in the rightmost stressed nucleus inputed from the previous cycle:

10. Level I: LLL, heads R

* line 1
 (** line 0
 oky

→

Level I: LLL, heads R

* *) line 1
 (** *) line 0
 oky pa

Level II: RRR, heads R

* line 2
 * *) line 1
 (* * *) line 0
 o ky pá

This account correctly captures the fact that not all morphological constituents undergo line 0 stress rules: class II affixes do not participate at all in the computations that define edges and heads for line 0. As a result, class II suffixes are invariably unstressed.

1.2.1. Stressed suffixes

An example of the level I suffix *-pa* interacting with the level II rule of vowel epenthesis is given in (11a). This example when compared with (10) and (11b), confirms our hypothesis that words formed by level I affixation undergo level II of the phonology, where the rule of epenthesis which is specific to derived environments applies:

11a.	Affixation: /mik -pa/		
	bi.k	syllabification	(level I)
	bi.k	stress (LLL,R)	(level I)
	----	epenthesis: glot. stop / _ . v	(level I)
	----	epenthesis: vowel / .c_c (und.)	(level I)
	----	lenition: p, t → β, r / v._v (und.)	(level I)
	bi.k.pa	syllabification	(level I)
	bi.k.pa	stress (LLL,R)	(level I)
	-----	epenthesis: glot. stop / _ . v	(level I)
	-----	epenthesis: vowel / .c_c (und.)	(level I)
	-----	lenition: p, t → β, r / v._v (und.)	(level I)
	-----	syllabification	(level II)
	b`i.k.pá	stress (RRR,R)	(level II)
	b`i.k<i>.pá	epenthesis: vowel / .c_c	(level II)
	----	lenition: / v_ { v	(level II)
11b.	Affixation: /ko:kot -pa/		
	ko:kot	syllabification	(level I)
	ko:kot	stress (LLL,R)	(level I)
	----	epenthesis: glot. stop / _ . v	(level I)
	----	epenthesis: vowel / .c_c (und.)	(level I)
	----	lenition: p, t → β, r / v._v (und.)	(level I)

ko:kot.pa	syllabification	(level I)
ko:kot.pa	stress (LLL,R)	(level I)
-----	epenthesis: glot. stop / _ . v	(level I)
-----	epenthesis: vowel / .c_c (und.)	(level I)
-----	lenition: p, t → β, r / v_ v (und.)	(level I)
ko:kot.pa	syllabification	(level II)
k`o:kot.pa	stress (RRR,R)	(level II)
ko:ko.t<o>.pa	epenthesis: vowel / .c_c	(level II)
----	lenition: / v_ [v	(level II)

The derivation in (11a) shows the root going through level I of the phonology independently. Then, the whole word enters levels I and II of the cycle as a unit. When the word enters block II, syllabification, stress, and vowel epenthesis apply. The epenthesis rule applying to (11a) is clearly not level I epenthesis, which is limited to underived environments, nor level III epenthesis, whose environment is **V.C_CV**, requiring a stress clash in its environment. That much is clear when example (11b) is taken into account, because there epenthesis applies in an environment in which a stress clash could never arise. Note that level II lenition does not apply in (11a) or (11b), because the environment triggering level II lenition of a stop (/ v_ [v) is before a vowel-initial morpheme, and the vowel in these cases is not morpheme-initial, but epenthetic.

1.2.2. Stress-neutral affixes

In derivations (12a) and (12b) we have examples of level II affixes being added to roots. We saw that level II is non-cyclic, that is, it applies to every word just once. Therefore, although (12a) has three level II affixes, there is just one passage of the word through level II rules.

12a. Affixation: /_{II} [_{II} [naka- _{II} [m- _I [a]]] -t] / decl-caus-do-nfut 'he made him do something'

a	syllabification	(level I)
a	stress (LLL, R)	(level I)
?a	epenthesis: glot. stop / _ . v	(level I)
----	epenthesis: vowel / .c_c (und.)	(level I)
-----	lenition: p, t → β, r / v._ v (und.)	(level I)
nā.kām.?a.t	syllabification	(level II)
-----	stress (RRR, R)	(level II)
-----	epenthesis: vowel / .c_c	(level II)
-----	lenition: / v_ [v	(level II)

In (12a), the nasal stop is syllabified as coda because it is followed by a consonant, and the obstruent in word-final position is left unsyllabified. In (12b), the unsyllabified obstruent in final position undergoes the lenition rule at level II, since the vowel-initial imperative suffix provides the environment that triggers the rule (/V__[V]):

12b Affixation: /a# _{II} [_I [tat]+a] / --> :tara 'go! (imperative)
2s-go-imperative

ta.t	syllabification	(level I)
ta.t	stress (line 0: LLL, R)	(level I)
----	epenthesis: glot. stop / _ . v	(level I)
----	epenthesis: vowel / .c_c (und.)	(level I)
-----	lenition: p, t → β, r / v._ v (und.)	(level I)
ta.ta	syllabification	(level II)
-----	stress (line 1: RRR, R)	(level II)
-----	epenthesis: vowel / .c_c	(level II)
ta.ra	lenition: / v_ [v	(level II)
a.ta.ra	syllabification	(level III)
----	epenthesis: vowel / v.c__ cv	(level III)
----	lenition: / v_ [v	(level III)

1.3. Conclusion

Since main stress in Karitiana is rightmost, the rules that account for stress assignment must create stress constituents in line 1 which are right headed. However, feet cannot have edges to the right of the rightmost syllable in line 0 of the stress grid, because final stress may be overridden by heavy syllables as in (15). The rules that account for stress in Karitiana (presented before in chapter 1, section 4.2) are listed in (13):

13.
 1. Project nuclei (ln.0)
 2. Insert a right parenthesis after heavy nuclei (ln.0)
 4. Line 0: LLL, Heads R (ln.0)
 5. Line 1: RRR, Heads R (ln.1)

14.

*	line 2	<i>bad, ugly'</i>
	*) line 1	
(*	*) line 0	
sara		

15.

*	line 2	<i>'alligator'</i>
	*) line 1	
(*)	*) line 0	
sa:ra		

16.

*	line 2	<i>'to see'</i>
	*) line 1	
(*	*) line 0	
so.ʔo:t		

17.

*	line 2	<i>'owl'</i>
	*) line 1	
(*)	*) line 0	
py:·py:p		

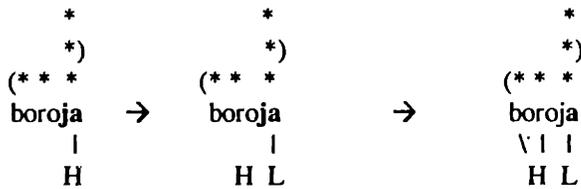
sentence to mark certain sentential types. The L melody is obligatorily inserted in declarative sentences, negated imperatives, and questions²⁵:

19. Intonational L-insertion²⁶:

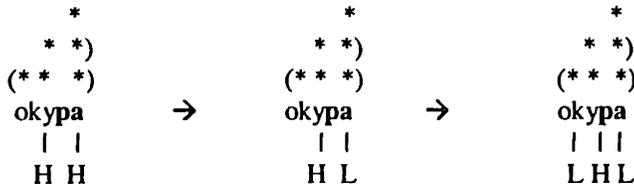
In.1 * *
 In.0 * ## → * / [... [___] Pwd] x where x = {declaratives, questions, negated imperatives}
 | ≠\
 H H L

The nucleus to which the L tone attaches is often the stress head of the last word in the sentence, and as such bears a H melody. When the L associates to a nucleus which bears a H tone, the latter delinks and floats. The floating H tone then associates to the next available nucleus, that is, the nucleus of the penultimate syllable:

20.



21.



²⁵ There seems to be dialectal variation with respect to the application of this rule in questions, in that some speakers consistently have a H tone in that environment. The rule of intonational L-insertion for those speakers applies exclusively in the environments {declaratives, negated imperatives}.

²⁶ Where ## stands for word-final.

In (20) and (21) we have two cases of trisyllabic words with final stress which pattern differently with respect to tone. The difference can be explained by the presence or absence of secondary stress. In (20), a L tone associates to the last stress-bearing syllable of the word, which has a H tone linked to it. When the lexical L is inserted, it associates to the last syllable, and the H tone which was previously linked to that syllable delinks and floats. The floating H then links to the toneless syllable adjacent to the stress head of the word, as well as to the next toneless syllable, yielding a HHL melody. Example (21) has the same association of a L tone to an already H syllable, resulting in a floating H tone. In (21), however, the output is one in which the floating H tone, when relinked, does not spread to the left. Instead, a default L is associated to the first syllable.

I will explain the difference in tone patterns in (20) and (21) as following directly from the foot structure in line 1. What makes the tone melody of (20) different from that in (21) is the fact that in the latter there are two stressed syllables, whereas in the former just one is present. The descriptive generalization is that a H tone linked to a stressed syllable never spreads to the left.

Another tonal process observed in Karitiana is the *rightward* spreading of a H tone associated to a stress head (cf. (22)):

22. a+tat+a --> atara
2s-go-imperative.

'go!'

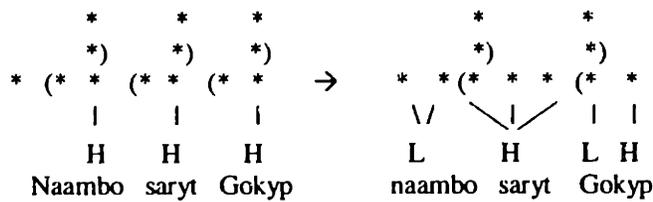
*		*
*)		*)
* (* *	→	* (* *
a ta ra		a t a r a
		\ /
H		L H

Example (22) ends in a H tone because the utterance is an affirmative imperative, and in these environments the intonational rule of L-insertion does not apply. A H tone is associated to the stress head of the word, that is, the nucleus of the syllable *ta* and spreads in rightward direction, to the toneless nucleus that follows. Leftward spreading of the H tone, as discussed, is disallowed because the melody is associated to a stressed nucleus (defined as an asterisk that projects into line 1 as a stress head). Therefore, the first syllable of the word is left toneless, and is realized as a default L tone.

We will explain the conditions on rightward spreading in the examples to be discussed in section 2.2.2: when a process of destressing applies to phonological phrases, the word that loses the stress and H tone is assigned the same melody of a preceding stress head inside the phonological phrase (cf. (23)). This process applies inside prosodic words and phonological phrases only in case the stress head and the stressless nuclei are adjacent. In (23), rightward spreading applies because the toneless suffix and the stress head of the root are adjacent and part of the same prosodic word. In (23) the evidential *saryt* has its stress deleted and its foot structure lost by virtue of forming a complex verbal head with the verb *ambo* (cf. section 2.2.6 for details on the syntactic conditions on destressing). When that happens the H linked to the destressed head automatically deletes. Since the stressed nucleus of the verb and the toneless nuclei of the evidential are adjacent, and the foot structure of the evidential was lost because of stress deletion, the H linked to the stress head of the verb spreads rightward to the toneless syllables of the evidential:

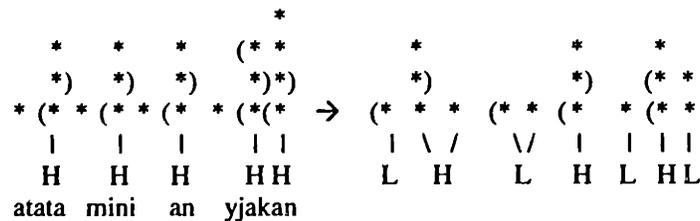
23. na:mbo saryt Gokyp
 na+ambo saryt-Ø Gokyp
 decl-raised ind.evid.-nfut sun
 'the sun raised (to the sky)'

24.



If the stress head is not immediately adjacent to the toneless nuclei, rightward spreading does not apply. In such cases, the destressed word will surface with a default L tone (cf. (24)). For instance, the stressed syllable of the verb *atata* is not adjacent to the stressless syllables of the negative polarity item *mini* since the epenthetic vowel <a> intervenes between the two words. This configuration prevents rightward spreading of the tone from the verb to the negative polarity item, and the latter gets a default L tone:

25. A+tat<a> min+i an yj+[a+kan]²⁷ 'You are going to the village, aren't you?'
 2s-go neg.pol. 2s 1p-[there-place]



We will see in section 2.2.6, that the rule of stress deletion applies to phrases undergoing levels III and IV of the phonology, that is, to phonological phrases (PPh) and intonational phrases (IntP), respectively.

²⁷ The word *akan* is a compound. In chapter 2, section 4.2.3.1, compounds were analyzed as level I units, formed by at least one prosodic word which undergoes levels I and II independently. In this case, both compound members are prosodic words, and as such undergo levels I and II independently before they enter level I as a constituent. At that level, the compound gets primary and secondary stress as a result of the application of the stress rule LLL, R.

In (26) I formalize the tone assignment procedures necessary to account for tone patterns in Karitiana. Note that all 4 steps make reference to units defined inside the metrical grid:

26. Tone assignment rules: (ordered)

a) *H tone assignment to a stress head:*
Assign a H tone to the **stress head of a morpheme**.

The **stress head of a morpheme** is defined as a line 1 asterisk

b) *Leftward spreading*
Assign a **floating H** tone to toneless nuclei to its left **iff** the tone is **not** linked to a **stress head**.

c) *Rightward spreading*
Assign a tone associated with a stress head to toneless nuclei to its right **iff** the stress head and the toneless nuclei are **adjacent** and **belong to the same prosodic domain** (PWd, PPh, IntP).

d) *Default L*
Assign a default L tone to all toneless nuclei.

2.2. Phrasal pitch accent and its interactions with the syntax of heads

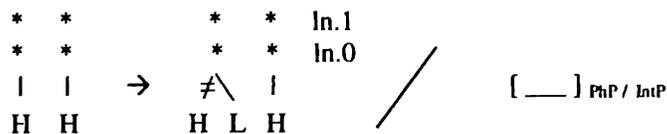
The rules discussed so far are able to account for most patterns in phrasal environments as well. However, to fully explain these patterns, in addition to the rules in (26), we must discuss two other phonological processes. The first one operates whenever two adjacent line 1 asterisks bear H tones, that is, in stress clash configurations, and consists of a L tone inserted between two adjacent H melodies. I will call this process “L-insertion”. The second process involves the stress subordination of one word to another in certain syntactic environments. Since the word bearing secondary stress behaves as if its tone pattern has been deleted, I will call this process “Stress deletion” or “Destressing”.

2.2.1. L-insertion

L-insertion is obligatory and occurs in the same syntactic and metric environments in which level III phrasal epenthesis applies. It differs from epenthesis in that the epenthesis rule applying at level III inserts a vowel between a stray consonant and a consonant in a stress clash configuration, whereas L-insertion inserts a L tone between two stressed syllables, regardless of the segmental configuration.

In addition to occurring in the same level III environments where epenthesis does, L tones are inserted in one environment where epenthesis does not apply: between a noun and an adjective, in a reduced relative clause construction (cf. chapter 1, section 4.2.3.1.). We saw that those units *do not* undergo level III of the phonology, by virtue of being clausal and thus larger than phonological phrases, which are clitic-host morphosyntactic units. Therefore, it is necessary to say that L-insertion applies at levels III and IV of the cycle. The prosodic units at level IV will be referred to as intonational phrases (IntP).

27. Rule of L-insertion (stress clash avoidance)



The insertion of a L tone to the first clashing H syllable in a configuration causes that first H tone to float. A floating tone is subject to the rule of leftward spreading, which often applies in such environments.

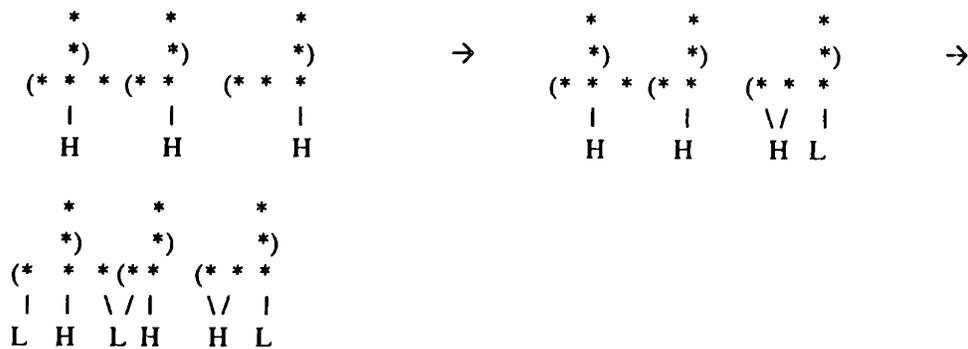
A complete set of examples of L-insertion will be given in sections 2.2.3 to 2.2.5 below, where I analyze the phrasal tone processes occurring in the available data sets:

declarative sentences from the text Gokyp ‘The Sun’, and two grammatical lists of questions and imperatives. In this section, I will limit myself to a detailed discussion of one example.

L-insertion is exemplified in (28b), in comparison to (28a), where no L-insertion takes place. Comparing the two, we see that only (28a) allows for two adjacent H tones linked to separate words to surface: in (28a) the H tone associated to the head of the verb *opít* can coexist with the H tone associated to the first two syllables of *ómbáky*, whereas in (28b) the H tone of the head of *ómbáky* cannot be adjacent to the H tone of the head *kát*.

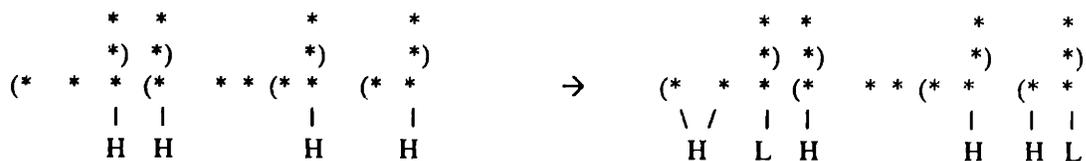
28a *taso na+opī+t ombaky*
man decl-cut-nf. jaguar

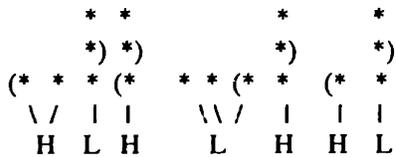
‘the man cut the jaguar’



28b *ombaky kat an+ta+okyt taso*
jaguar asleep DOFC-decl-kill man

‘the sleeping jaguar was killed by the man’





In (28a) the head of each word associates to a H tone (cf. rule (26a)). A L intonational tone is linked to the last nucleus of the sentence (cf. (19)), displacing the H previously linked to the stress head of the word *ombaky*. The delinked H floats and associates to the next toneless syllabic nucleus to the left. The H then spreads to the left according to (26b). Rule (26c) does not apply in this example, because no toneless syllables remain to the right of the stress head of each word. Note that the H tones of *tasō* and *naopīt* do not associate leftward by virtue of not floating and being associated to stress heads, and thus a default L tone is assigned to the remaining toneless syllable of the verb and subject.

It is possible to explain (28b) as following from a prohibition against stress clash. The two adjacent H tones in question are not only adjacent as in (28a), but also linked to stressed nuclei. This stress clash triggers the application of rule (27), that inserts a L tone between the two clashing high melodies, linking it to the leftmost nucleus involved in the clash.

2.2.2. Stress Deletion

In certain syntactic environments a rule of destressing applies, which deletes the stress head of one of the lexical items in that phrasal unit. The result is that only one lexical item in the phrase will have a line 1 asterisk represented in the grid, and the tone previously associated to the unstressed syllable will float and associate to all of the

unstressed syllables to the left of the unfooted toneless domain, according to rule (26b). The environments in which destressing occurs in our data are: between two heads in compounds, or between a clitic and its host in the following environments: verb-negation, verb-evidential, verb-aspect, noun-postposition, NP-adverbial clitics, wh-words and their hosts, and between a verb and the oblique object *ka*. These syntactic units are mapped into the phonology as phonological phrases (cf. definition in chapter 1, section 4.2.3.2), or intonational phrases and enter the phonological cycle at level III and IV, respectively. Therefore, stress deletion must be listed as a rule operating at levels III and IV.

Section 2.2.3 examines all cases of stress deletion and destressing in the text entitled *Gokyp*. Sections 2.2.4 and 2.2.5 discuss those same processes in imperatives and questions, respectively. Section 2.2.6 gives an account of stress deletion. In 2.2.7 I conclude by summarizing the phrasal pitch accent rules discussed in section 2.2.

2.2.3. Stress Deletion and L-insertion in examples from the text “Gokyp”

In this section, we will deal with all cases of L-insertion (as stress clash avoidance) and stress deletion present in the text “Gokyp”. The reader should be aware that in many cases both processes apply to the same example. For ease of exposition, I will start discussing the cases in which a single process applies. Another point of added complexity is that the intonational rule inserting a L tone sentence-finally will also apply in some cases (declaratives, negated imperatives, and questions). Phrases which occur sentence-medially in the text do not undergo that rule, and as a result they end in a H tone. All examples examined in this section fall into that category.

Note that in (29) the word *otidna* has no H tone associated to its stressed syllable:

29. Takinda	otidna	sogng		<i>ta+kinda otidna</i>	<i>sogng</i>
\ /	\ /			[3-[thing wound-adj.]]	with
L H	L	H		'with his disease'	

In (29), whose metrical plane is represented below in (30), the L tone in *otidna* cannot have arisen from L-insertion because this structure does not involve a stress clash. The L tone in question must be a default tone, inserted by rule (26b). This fact confirms our hypothesis that, whenever destressing applies, H deletion automatically follows, as part of the same rule. If that were not the case, the tone pattern of the destressed word should be HHH:

30.

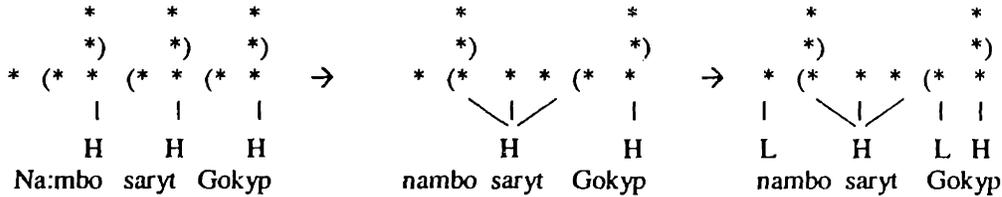
	*	*	*	→	*	*
	*)	*)	*)		*)	*)
*	(* *	* (* *	(* *		(* *	* * *
					\ /	\ /
	H	H	H		L H	L H
Ta kin da	otidna	sogng				

Rightward spreading did not take place in this case because at the level in which tone rules (26) apply the second member of the compound *takinda otidna* is mapped into a phonological phrase with the postposition, and not with its first member. The same observation holds for example (36).

In (31) we have another example of destressing without L-insertion, because a stress clash is crucially absent from the metrical structure. In (31) two instances of stress

33.

na+ambo *saryt* *Gokyp*
 decl-raised ind.evid. sun
 'the sun raised (to the sky)'



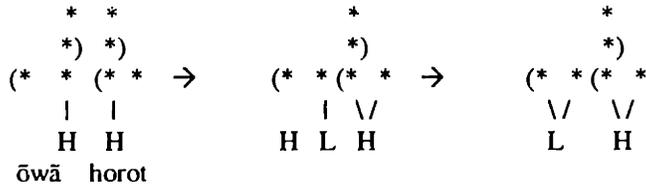
Examples (34) and (36) below are instances of the adverbial *horot* forming a phonological phrase with a preceding noun phrase. They both involve stress deletion, which will be implemented in this case as the deletion of the stress head (the line 1 nucleus) of the lexical item adjacent to the adverbial. Another phonological process applying in these examples is L-insertion between the two clashing H melodies associated to the first nucleus of *horot* and the last nucleus of the preceding word:

34. *ōwā* *hór<o>t* 'child-like'
 \ / \ /
 L H
 child like

There is no sentence-final L inserted at the end of the phrase in (34) because the phrase occurs sentence-medially in the text. According to (26a), we would expect the stress heads of both words to be assigned H tones, a clash which would be resolved by the L-insertion rule (27), resulting in the melody HLHH. The noun-adverbial combination in (34), however, triggers destressing. In fact, whenever the adverbial clitic

horot occurs in a phrase, the deleted stress must be that of the last lexical item in its sister noun phrase:

35.

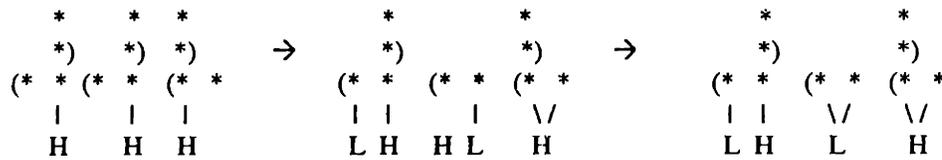


When the stressed nucleus and H melody of *ōwā* are deleted, the L sentential tone which was linked to the last syllable of the word to avoid a stress clash spreads to the other toneless syllable to its left. Leftward spreading is possible because of destressing, since (26b) prohibits leftward spreading from a stressed syllable. Finally, the H associated to the first syllable of *horot* further associates to the last nucleus, yielding the LLHH pattern.

The corpus has another example of destressing inside a prosodic unit formed by a noun phrase and *horot*:



37.



Example (36) is a case of L-insertion and destressing. In (36), the leftmost member of the larger phrase *[[kinda oti] horot]* is destressed. The melody of the destressed word *oti* is L because the stress clash between *oti* and *horot* caused the application of the L-insertion

rule, and leftward spreading (cf. (26b)) applied, associating that L tone to the first syllable of the word.

(38) is an example of L-insertion and destressing involving the verb *iaoky*, which, when construed as a phonological phrase with negation, undergoes destressing (cf. (39)).

38.	<i>iaoky</i> \ / L	<i>padni</i> \ \ / H		<i>i+a+oky</i> 3-DOFC-kill 'He wasn't killed'	<i>padn+i</i> neg-irr																																				
39.	<table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="padding: 0 5px;">*</td><td style="padding: 0 5px;">*</td><td></td><td style="padding: 0 5px;">*</td><td></td><td style="padding: 0 5px;">*</td></tr> <tr> <td style="padding: 0 5px;">*</td><td style="padding: 0 5px;">*)</td><td style="padding: 0 10px;">→</td><td style="padding: 0 5px;">*)</td><td style="padding: 0 10px;">→</td><td style="padding: 0 5px;">*)</td></tr> <tr> <td style="padding: 0 5px;">**</td><td style="padding: 0 5px;">(**</td><td style="padding: 0 5px;">(**</td><td style="padding: 0 5px;">**</td><td style="padding: 0 5px;">**</td><td style="padding: 0 5px;">(**</td></tr> <tr> <td style="padding: 0 5px;"> </td><td style="padding: 0 5px;"> </td><td></td><td style="padding: 0 5px;"> </td><td style="padding: 0 5px;">\ /</td><td style="padding: 0 5px;">\ \ /</td></tr> <tr> <td style="padding: 0 5px;">H</td><td style="padding: 0 5px;">H</td><td></td><td style="padding: 0 5px;">L</td><td style="padding: 0 5px;">H</td><td style="padding: 0 5px;">L</td></tr> <tr> <td style="padding: 0 5px;"><i>iaoky</i></td><td style="padding: 0 5px;"><i>padni</i></td><td></td><td></td><td></td><td></td></tr> </table>					*	*		*		*	*	*)	→	*)	→	*)	**	(**	(**	**	**	(**					\ /	\ \ /	H	H		L	H	L	<i>iaoky</i>	<i>padni</i>				
*	*		*		*																																				
*	*)	→	*)	→	*)																																				
**	(**	(**	**	**	(**																																				
				\ /	\ \ /																																				
H	H		L	H	L																																				
<i>iaoky</i>	<i>padni</i>																																								

A last descriptive point that needs to be made with respect to destressing is that among all the phrase types in which that process occurs, all but one (the NP-adverbial clitic *horot*) are also attested without destressing in the text. Although, I will explain in section 2.2.6 the syntactic motivation for stress deletion, the reason why the process is not obligatory will remain a mystery until further research is carried on the topic.

2.2.4. Examples of L-insertion and stress deletion in imperatives

In Karitiana, affirmative imperatives end in a H tone, whereas negative imperatives end in a L tone²⁸:

40. A+tat<y> 'Don't go'
2s-go-neg.imp.

*		*
*)		*)
* (* *	→	* (* *
		\ /
H		H L
a tat y		a ta ty

The head is L in (40) because the intonational rule of L-insertion (cf. (19)) links a L tone to the final head of a negated imperative.

41. A+tat+a 'Go'
2s-go-aff.imp.

*		*
*)		*)
* (* *	→	* (* *
		\ /
H		L H
A ta ra		a ta ra

²⁸ Negated imperatives are formed by a verb inflected for agreement (subject agreement if intransitive, object agreement if transitive), and followed by the negation word *padni*, which is often omitted, as in (40). When the verb root is obstruent-final, an epenthetic vowel is inserted between the verb and the negation word by the application of epenthesis rule (cf. chapter 2). The quality of the vowel in this case is not determined by assimilations of the features of a preceding vowel, but is listed in the lexicon as the [+hi, +bk] vowel <y>. Note that even when the negation word is dropped, the epenthetic vowel remains. This occurs in all verb-*padni* units in the language (cf. section 4.2.3.2, chapter 2). If the verb root of a negated imperative ends in a nasal consonant or in a vowel, predictably, no epenthesis takes place, and the verb stem is unmarked for imperative mood. Affirmative imperative verbs are marked by the suffix *-a*, which suffixes a consonant-final root. When the root ends in a vowel, the stem is unmarked. It is interesting to notice that negated imperative verbs ending in a vowel would be phonetically indistinguishable from affirmative imperatives ending in a vowel if it weren't for the intonational difference between them.

In (40) an intonational L is linked to the stress head of the last word, displacing the H tone. The floating H links to toneless syllables adjacent to the stress head. The L tone cannot spread to the left because it is linked to a stress head, so it spreads to the right. In (41) the same rule of rightward spreading applies to the H tone associated to the stress head of the word. The L tone associated to the first syllable is a default melody.

The next four examples illustrate the application of the intonational rule (19) in negated imperatives²⁹:

42. An y+mi 'Don't hit me'
 2pron 1s-hit

* * * *

*) *) *) *)

(* * (* → * * (*

| | | | |

H H H H L

An y mi an y mi

43. A+pi so padn+i 'Don't step in it'
 2s-step neg-irr

* * * *

*) *) * *)

*(** (** → *(** (** *

| | \ / | \ /

H H L H L

api so padn a pi so pa dni

Note that, if we say that intonational L tones are linked to the stress head of the last word in a sentence, we can explain two facts: (i) why the tone adjacent to a L stress head is H in this case; (ii) why syllables following the L stress heads are assigned a L tone. The first fact could be stipulated by rule that assigns “the opposite” tone to the nucleus left-adjacent to a stress head. However, our rules of L-insertion have the

advantage of deriving the right tone melodies, because they force delinking of the high tone previously associated to the stress head, which then explains why the nucleus left-adjacent to a L stress head surfaces as H. The second fact would have no explanation if the L intonational tone were linked to the last syllable in the sentence, instead to the last stress head of the last word in the sentence. Leftward spreading would not be able to apply to yield the correct outputs in (43)-(45) because the stressed syllable would have a H tone and rule (26b) restricts spreading to toneless nuclei:

44. An imsemboky 'Don't get wet'
 2pron 3-caus-wet-neg.imp

* * * *
 *) *) *) *)
 (* * * (* * → (* * (* * *
 | | | \ / \ /
 H H H H L
 An imsemboky

45. An iatoty 'Don't take it'
 2s 3-take-neg.imp

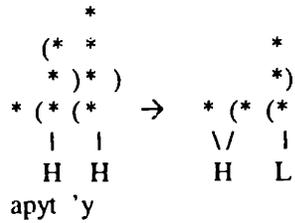
* * * *
 *) *) *) *)
 (* * * (* * → (* * (* * *
 | | | \ / \ /
 H H H H L
 An iatoty

The next four examples are affirmative imperatives ending in H tones, where rule (19) does not apply. The tonal patterns in these cases are similar to the one in (41)³⁰:

²⁹ Agreement in imperatives follow the ergative pattern of the language: Intransitive subjects and objects agree with the verb.

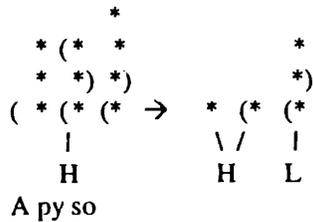
³⁰ Note that, in Karitiana, both the the verb and the referential auxiliary are suffixed by the imperative marker (cf. (47)).

50. A+pyt'y 'Don't eat'
2s-eat

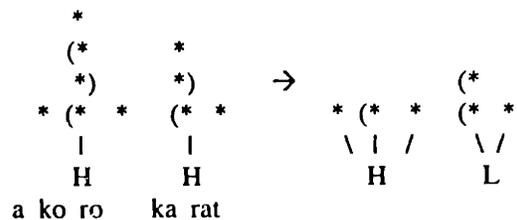


Although the intransitive verb *pyt'y* is stress-final, it is not monomorphemic (*pyt+'y* 'hand(?) -eat(tr.')). *Pyt*, being the first member of a compound, enters the phonology at level I as a separate word, and is accented. However, the head of the compound is the transitive verb 'y, and the stress prominence of *pyt* is lost by stress deletion.

51. A+py+so 'Don't touch it (literally, 'don't be hand-aware')'
2s-hand-aware



52. A+kor<o>+kar<a>+t 'Be careful' (literally, 'think inside')
2s-inside-think-?



In (52) an affirmative imperative ends in a low melody. I claim that this apparently exceptional pattern can be understood from the intended meaning of the sentence. A

sentential L tone is inserted in this case because the sentence is uttered as a “warning”, reflecting the belief of the speaker. That is, the use of the imperative here has a declarative effect, which explains the insertion of the declarative L tone. The L first associates to the stress head of the last morpheme, thus causing the H tone to float, and associate to the remaining toneless syllables to the left of the stress head according to (26b).

In (53) the verb-negation unit *gasta padni* undergoes L-insertion and destressing of the verb³¹:

53. An i-gasta padni dinhero 'Don't spend money'
 2s 3-spend neg. money

*	*	*	*	*	*	*
*)	*)	*)	*)	*)	*)	*)
(*	*(*	*(*	*(*	*(*	*(*	*(*
					\ /	\ /
H	H	H	H	H	L	H
an	igasta	padni	dinhero	an	igasta	padni

In (54) there is a clash between the verb *amy* and the oblique object, which triggers L-insertion and stress-deletion. This type of prosodic constituent (verb-oblique object) does not enter level III of the phonology elsewhere in the language, and for that reason we assume the unit is undergoing destressing at level IV:

54. A+amy ka+t y+hot 'Buy me this'
 2-buy this-obl. 1s-to

*	*	*	*	*
*)	*)	*)	*)	*)
(*	*(*	*(*	*(*	*(*
			\ /	
H	H	H	L	H
A	my	kat	y	hot

³¹ The verb [*gasta*] and the noun [*dinhero*] are borrowings from Portuguese.

55. Yn atakahit kat 'I gave you this'
 1s 2s-realis-give this-obl.

The last issue to be discussed in this section is the apparently exceptional example

(56):

56. I+m+'a siit+o 'Make tamales'
 3-caus-do tamale-emph

* *	* *		* *	
*) *)	*) *)		*) *)	
* (* (* *	→ * (* (* *		* (* (* *	
		\ /		
H H		L H L		L
im'a siito		im 'a sii to		

In (56) an affirmative imperative ends in a L tone. The reason why this occurs can be explained by the behavior of the emphatic suffix –o, which is always associated with a L tone wherever it occurs. I assume that the emphatic suffix has a L melody underlyingly.

2.2.5. Examples of L-insertion and stress deletion in Questions

The cases of stress deletion in interrogatives available in our data set are limited to two syntactic environments: between wh-words and an adjacent word (either the leftmost lexical item inside their sister constituents, or the verb in Comp) as in (57) and (58), and between a verb and the negative polarity item *mini* in (59):

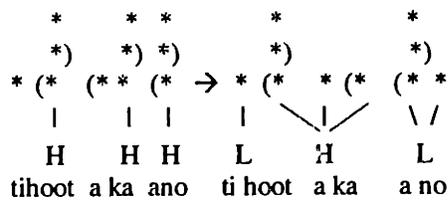
57. Ti+ka+t 'id+na+t a-'a tyka+t 'How many children do you have?'
 wh-aux-? child-vblzr-? 2s-have impfve-nfut

* *	* *	* *	* *		* *	* *	* *
*) *)	*) *)	*) *)	*) *)		*) *)	*) *)	*) *)
* (* (* *	* (* (* *	* (* (* *	→ * (* (* *	* (* (* *	* (* (* *	* (* (* *	* (* (* *
				\ /	\ /		
H H	H H	H H		L H	L H	H L	H L
tikat 'idnat	a'a	tykat					

L-insertion between *tikat* and *'idnat* and destressing of the word *tikat* apply in (57). Note that there is no epenthetic vowel between *tikat* and *'idnat*, showing that this type of prosodic constituent does not go through level III of the cycle. This indicates that the rule of stress deletion applying in this example is operating at level IV of the phonology.

58. Ti+hoo+t a+aka an+o
wh-aux-? 2s-cop 2s-emph.

'Where do you live?'



In (58) the verb *aka* is destressed by virtue of being inside a prosodic constituent with the wh-word *tihoot*. *Aka* loses its stress and H tone, and the application of rule (26c) ensures that the H tone linked to the stress head of the wh-word spreads rightward to the verb. I do not have evidence that *tihoot* does not go through level III epenthesis, but I will consider the prosodic unit it forms with the verb to be a constituent which enters the phonology at level IV because: (i) the wh-word *tikat*, which is certainly a level IV unit, has phonological, syntactic and semantic similarities with *tihoot*; (ii) I do not remember ever hearing the form *tihoot<o>*.

In (25), repeated here as (59), the negative polarity item *mini* is destressed. This negative polarity item is used to prime an affirmative response to polar questions (a function in many respect similar to that of tag questions in English).

59. A+**tat**<a> min+i an yj+[a+**kan**]
 2s-go neg.pol. 2s 1p-[there-place]

'You are going to the village, aren't you?'
 (literally, 'Aren't you going to the village?')

*	*	*	*		*		*	*
*)	*)	*)	(* *)		*)		*)	(* *)
* (* *)	(* *)	(* *)	(* *)	->	(* *)	*	(* *)	(* *)
					\ /	\ /		
H	H	H	HH		L H	L	H	L H L
atata	mini	an	yjakan					

2.2.6. An analysis of stress deletion

Stress deletion inside phonological phrases may occur in one of two ways: either the rightmost or the leftmost member of the phonological phrase has its main stress wiped out. Below we examine the various phonological and syntactic environments which, in our data set, are associated with destressing:

2.2.6.1. Right-headed phrases

These are the prosodic phrases in which the stressed nucleus of the leftmost lexical item is deleted:

(I) NP-Comparison Adverb *horot*: examples (35) and (36):

[õwã horot]_{PhP}
 \ / \ /
 L H

[[kinda oti]_{PhP} horot]_{PhP}
 | | \ / \ /
 L H L H

(II) Compounds: (50)-(52) below:

[apyt'y]_{PhP}
 \ / |
 H L

[apysɔ]_{PhP}
 \ / |
 H L

[akoro kārāt]_{PhP}
 \ / \ /
 H L

(III) NP-Postposition: in (29):

[[Takinda otidna] sogng]_{PhP}
 \ / | \ / |
 L H L H

(IV) V-Negation word *padni*: In (38) and (53):

[iaoky padni]_{PhP}
 \ / / \ /
 L H

[igasta padni]_{PhP}
 \ / \ /
 L H

The prosodic units listed in (I)-(IV) undergo level III of the phonology (cf. chapter 1, section 4.2.3.2), which is evidence that stress deletion applies at that level³². We saw that the prosodic constituents in (V) and (VI) are larger than the units undergoing level III of the phonology, suggesting that stress deletion also applies at level IV, a level which operates on even larger prosodic units, which I call intonational phrases (IntP):

³² Although the adverb horot is not discussed in chapter 2, there are examples in our corpus confirming its status as part of a prosodic constituent which undergoes level III epenthesis: opok<o> horot 'whitemen-like'.

(V) V-Oblique NP: In (54):

[Aamy **kat**]_{IntP}
 \ / |
 L H

(VI) Wh-word *tikat*-host inside wh-phrase in (57):

[tikat 'idnat]_{IntP}
 \ / \ /
 L H

2.2.6.2. Left-headed phrases

The following are the prosodic phrases in which the stressed nucleus of the rightmost member is deleted:

(I) V-aspectual auxiliary: Example (31):

[i'a tyka]_{PhP}
 | \ | /
 L H

(II) V-Evidential: In (33):

[nambo saryt]_{PhP}
 | \ | /
 L H

(III) V-Negative polarity item *mini*: In (59)

[Atata mini]_{PhP}
 | \ / \ /
 L H L

In left-headed environment as well there is evidence that stress deletion operates in two levels of the phonology: phrases (I)-(III) undergo level III rules (cf. chapter 1, section 4.2.3.2), whereas phrases in (IV) and (V) do not (cf.sections 2.2.3 and 2.2.5):

(IV) Wh-word *tihoot*-Verb: In (58):

[*tihoot aka*]_{IntP}
 | \ | /
 L H

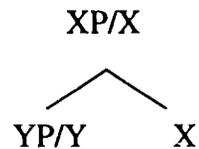
(V) NP-Adverb: In (31):

[*yjxa pitat*]_{IntP}
 | \ | /
 L H

There is evidence that the phonological phrases which constitute an environment for the phonological rule of destressing are defined syntactically. Corroboration for the hypothesis that syntax plays a role in defining these phrases comes from a coincidence between syntactic and phonological headedness. That is, right headed syntactic structures such as compounds, postpositional phrases, and verb phrases are also phonologically right-headed in our data set.

I will now proceed to examine the syntactic configuration of each case in which destressing applies. Most phonological phrases which are right-headed with respect to stress are syntactic structures in which a complement is adjacent to the head that governs it. The clearest cases are NP-postpositions, compounds, and NP-comparison adverb *horot*. The structures involved are represented in (60):

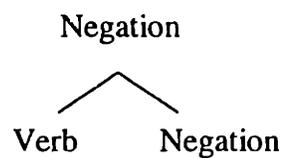
60.



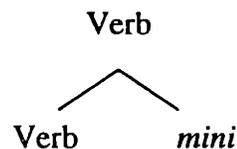
where x = postposition, compound head, or the adverbial *horot*

Recall that the phonological phrase formed by a verb and *padni* is phonologically right-headed and that the one formed by a verb and the negative polarity item *mini* is phonologically left-headed. I assume that this difference is a reflex of their syntactic constituency:

61.



62.



In chapter 5 we will see that Karitiana projects a polarity phrase headed by the negation word *padni* or by the assertative prefix *pyt-*. The verb raises overtly to the negation head in the syntax, forming an indivisible complex head with it. The fact that negation heads the verb-negation constituent is corroborated by the special behavior of negated verbs in Karitiana: they are not inflected for tense. The structure of the complex head formed by verb+*mini* is obviously different from that of verb+*padni*, in that, in all respects, it behaves syntactically as a verb. In particular, the complex head can be suffixed by tense:

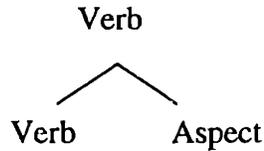
63. Yjxa i-aka min-<a>n haka?
 people 3-cop neg.pol-nfut here

'Is anyone here?'
 (literally, 'Isn't anybody here?')

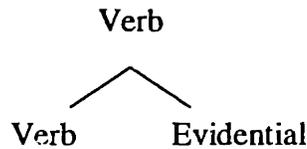
I assume the configuration in (64) also arises when a verb forms a complex head with

Aspect or Evidential auxiliaries:

64.



65.



The non-future tense suffix, which appears on the negative polarity item *mini*, also mark aspect and evidential heads (cf. sections 2.2.3 and 2.2.5), but never a negated verb.

The only structures which still remain to be discussed are the *wh*-phrases (56) and (57). The former is phonologically right-headed, whereas the latter is phonologically left-headed for the following reason: a *ti*-phrase (*wh*-phrase) in Spec,CP has to have one main stress. In (57), *tihoot* is the whole *wh*-phrase, whereas in (56) the syntactic head projecting the phrase is the adjective '*idna*', which explains why the phrase is also phonologically right-headed.

2.2.7. Conclusion

All instances of stress deletion in our corpus were analyzed in section 2.2. We saw that some of them also involve low tone insertion (L-insertion). While L-insertion is motivated by a clash between two stressed heads, stress deletion is a syntactically motivated result of stress subordination between a syntactic head and lexical item adjacent to it which is part of its sister or spec. The deleted stress is always that of the non-projecting head. Both processes occur at levels III and IV of the phonology.

CHAPTER 3 - WORD ORDER

0. Introduction

My goal in this chapter is to show that Karitiana is a verb-final language which displays obligatory verb movement to C in root clauses. Evidence for verb raising to C comes from three sources: (i) the relative word order of the verb with respect to its arguments; (ii) agreement and tense; (iii) adverb adjunction.

Section 1 establishes that there is a complementary distribution between matrix and embedded clauses with respect to the position of the verb. The former are either verb-initial (VOS, VSO) or verb-second (SVO, OVS), whereas the latter are invariably verb-final (OSV, SOV) (cf. Storto (1994)). Verb raising in root clauses is associated with the presence of agreement and tense, which are absent in dependent clauses. This obligatory movement of the finite verb in root clauses, bears a strong resemblance to the phenomenon known as verb-second (Vikner (1995), Koopman, (1983)) in Germanic languages. We will see, however, that verb second (V-2) in Karitiana has different properties than it has in Germanic. Specifically, Karitiana allows verb-initial clauses (although there is a tendency for the first position to be filled) and embedded clauses do not project TPs or CPs but rather are VPs dominated by a single functional projection: an aspectual phrase.

In section 2, I show that the specifier of the position to which the verb raises is a focus position. It is the landing site of *wh*-phrases, and focused phrases given as answers to *wh*-questions.

Section 3 is a discussion of clause structure motivated by evidence from adverb adjunction. We will see that most dependent clauses have one position for adverb adjunction (clause-initially), whereas SVO root clauses have three: before the subject, between the verb and the object, and after the object. I argue that this follows from the fact that verb movement to a second structural position takes place in root clauses, but not in dependent clauses. The impossibility of adverb adjunction between the subject and verb in matrix environments is explained by the fact that they are in the spec and head positions of CP, respectively.

In section 4, I discuss word-order variation in Karitiana, showing that in VSO and VOS clauses there is a strong tendency for adverbs to occur pre-verbally. I suggest this follows from the V-2 effect: a requirement the language has to fill the first structural position in the clause once the verb has raised to second position.

Although much work remains to be done in order to explain topic and focus effects in Karitiana matrix clauses, the difference between V-2 and V-1 word orders seems to correlate with the presence and absence, respectively, of a syntactically focused phrase in Spec, CP, as well as with a phonological requirement to fill that position whenever possible.

1. Verb raising

There is complementary distribution between matrix and embedded clauses with respect to the position of the verb. In embedded clauses, the verb occurs in final position, whereas in matrix clauses it is either in first or second position:

Transitive main clauses with agreement:

- | | | | | |
|----|------------|-------------------------|--------------|--|
| 1. | Taso | i-oky-t | boroja | <i>'The man killed the snake' (non-decl)</i> |
| | <i>man</i> | <i>3-kill-nfut</i> | <i>snake</i> | |
| 2. | Taso | Ø-na-oky-t | boroja | <i>'The man killed the snake' (decl)</i> |
| | <i>man</i> | <i>3-decl-kill-nfut</i> | <i>snake</i> | |

Transitive main clause without agreement

- | | | | |
|----|-------------|--------------------|--------------|
| 3. | *Taso | oky(-t) | boroja |
| | <i>mar.</i> | <i>kill(-nfut)</i> | <i>snake</i> |

Examples (1), (2) and (3) show that in transitive root clauses (declarative and non-declarative) the verb is in second position and agreement is obligatory. No agreement occurs in subordinate clauses, where the verb is in final position with respect to its arguments (cf (4)-(5))³³:

Transitive embedded clauses without agreement:

- | | | | | | |
|----|--|--------------|-------------|---------------|-------------------------------|
| 4. | [Boroja | taso | oky | tykiri] | Ø-naka-hyryp- Ø ðwā |
| | <i>snake</i> | <i>man</i> | <i>kill</i> | <i>perfve</i> | <i>3-decl-cry-nfut. child</i> |
| | <i>'When the man killed the snake, the child cried' (colloquial)</i> | | | | |
| 5. | [Taso | boroja | oky | tykiri] | Ø-naka-hyryp- Ø ðwā |
| | <i>man</i> | <i>snake</i> | <i>kill</i> | <i>perfve</i> | <i>3-decl-cry-nfut. child</i> |
| | <i>'When the man killed the snake, the child cried' (archaic)</i> | | | | |

(Storto 1997)

³³ The aspectual head following the verb takes VP as a complement. These head-final aspectual projections (AspPs) are the only functional categories present in dependent clauses. AspPs are right-headed, in accordance with the head-final character of the language.

Examples (4) and (5) are well-formed because in both cases the verb is final with respect to its arguments. The difference between the two clauses reflects a stylistic variation: OSV is the usual word order in a dependent clause, whereas SOV is found in mythological narratives exclusively. The presence of third person agreement in (6) and (7) renders these sentences ungrammatical, even when the word-order is verb-final:

Transitive embedded clauses with agreement:

6. **[Boroja taso i-oky tykiri] Ø-naka-hyryp- Ø õwā*
snake man 3-kill perfve 3-decl-cry-nfut. child
7. **[Taso boroja i-oky tykiri] Ø-naka-hyryp- Ø õwā*
man snake 3-kill perfve 3-decl-cry-nfut. child

A change in word order resulting in verb-initial (cf. (8) and (9)) or verb-medial sentences (cf. (10) and (11)) is ungrammatical, whether or not agreement is present:

Transitive embedded clauses with or without agreement:

8. **[(I-)oky taso boroja tykiri] nakahyryp õwā* **[VSO]*
(3-)kill man snake perfve 3-decl-cry-nfut. child
9. **[(I-)oky boroja taso tykiri] nakahyryp õwā* **[VOS]*
(3-)kill snake man perfve 3-decl-cry-nfut. child
10. **[Boroja (i-)oky taso tykiri] Ø-naka-hyryp- Ø õwā* **[OVS]*
snake (3-)kill man perfve 3-decl-cry-nfut. child
11. **[Taso (i-)oky boroja tykiri] Ø-naka-hyryp- Ø õwā* **[SVO]*
man (3-)kill snake perfve 3-decl-cry-nfut. child

Intransitive clauses pattern in the same way as transitives: agreement is obligatory in root clauses (cf. (12) and (13)), where the verb is not in final position:

Intransitive main clause with agreement

12. Y-ta-opiso-t (yn) 'I listened'
1s-decl-listen-nfut 1s

Intransitive main clause without agreement

13. *Ta-opiso-t (yn)
decl-listen-nfut 1s

(Storto 1997)

Examples (14) and (15) show that agreement does not occur in embedded clauses, where the verb is final³⁴:

Intransitive embedded clause without agreement

14. [Yn opiso] a-taka-kārā-t an 'You thought that I listened'
1s listen 2s-decl-think-nfut 2s

Intransitive embedded clause with agreement

15. *[Y-opiso yn] a-taka-kārā-t an
1s-listen 1s 2-decl-think-nfut 2s

(Storto 1997)

Note that subordinate clauses lack tense morphology, in contrast to root clauses, where tense morphology is obligatory. In the examples above, the marker of nonfuture tense is *-t* after vowel-final roots, and $-\emptyset$ after consonant-final roots. This is evidence that, if the embedded verb raises at all, it raises to a functional head lower than T or to a tenseless T, because embedded verbs never raise to a position in which tense is checked.

³⁴ The pronoun in (14) can cliticize to the verb, yielding (1) below. We know that the cliticized pronoun in (1) is not agreement, because it cannot co-occur with a pronoun (cf. (2)):

1. [Y-opiso] a-taka-kārā-t an 'You thought that I listened'
1s-listen 2-realis-think-nfut 2s
2. *[Yn y-opiso] a-taka-kārā-t an
1s 1s-listen 2-realis-think-nfut 2s

The complementary distribution observed can be explained if we assume that Karitiana is a verb-final language which displays obligatory verb movement in matrix clauses. When the verb moves, it checks tense and agreement. For this reason, verb-first or verb-second clauses have tense and agreement, whereas verb-final clauses do not. The latter have the verb either in situ, or adjoined to a head-final functional head which functions as a subordinator.

The hypothesis that the basic word order in Karitiana is verb-final makes sense both synchronically and diachronically. Synchronic evidence can be found in the head-final property of the language:

(i) PPs are right-headed:

16. Ambyyk a-taka-karama-j ahe kyn Casa do Indio pi-p
Then 2s-decl-turn-irr right toward Casa do Indio place-to/in
'Then you will turn right to (go to) Casa do Indio'
17. Sete de Setembro tyym a-taka-tar-i hotel pi-p
Sete de Setembro through 2s-decl-go-irr hotel place-to/in
'You will get to the hotel through Sete de Setembro (avenue)'
18. Yn na-amy-t kombo sepa pi-p
Is decl-put-nfut cocoa basket place-to/in
'I put the cocoa (fruit) in the basket'
19. Koro'op pasap pitat taso op'it ãonso hãrãj sogng
Inside smooth very man young woman beautiful benefactive
'The young man is in love with the beautiful woman'
20. Iij na-aka-t i-mboryt 'epe-'opo tyym
Bird decl-cop-nfut part-leave tree-hole through
'The bird left through the hole'
21. Iij na-aka-t i-mboryt 'epe-'opo pi-ri
Bird decl-cop-nfut part-leave tree-hole place-from
'The bird left from the hole'

22. I-tyt y-taka-tar-i i-ambi-p
 3-with 1s-decl-go-irr 3-house-to/in
 'I will go to his house with him'

(ii) DPs, such as phrases headed by demonstratives are right-headed:

23. Ka 'irip aka 'That tapir (moving)'
 Aux.moving tapir det.

24. Ony 'irip aka 'That tapir' (default)
 Aux tapir det.

25. Ja 'irip aka 'This tapir (sitting)'
 Aux.sitting tapir det.

(iii) Subordinate clauses are right-headed. The VP is taken as a complement by a head-final aspectual projection:

Kiit: 'punctual' (temporal coincidence)

26. [Yn i-soko'i] kiit]] a-otam-am
 1s 3-tie.up exactly.when 2s-arrive-?
 'When I tied it up, you arrived (at the exact time)'

Takiit: 'before'

27. [Ta-tat] takiit]] naka-tat Porto Velho ta-sombak
 3anaph-go before 3-decl-go Porto Velho 3anaph-watch-nfut
 'Before he left, (he) went to look at Porto Velho'

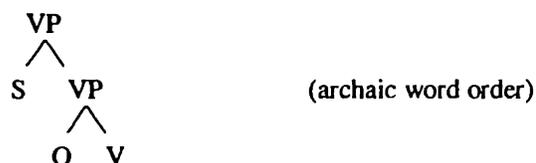
Byyk: 'after' (subsequent perfective)

28. [Yn na-soko'i] byyk]] yn a-taka-hir-i
 1s decl-tie.up after 1s 2-decl-give-irr
 'After I tie it up, I will give it to you'

Diachronically, the verb-final hypothesis fits the pattern found in the genetically related Tupi languages. All Tupi languages are strictly OV, and SOV is the word order hypothesized for Proto-Tupi (Moore 1991), the ancestor language.

Having suggested that Karitiana is a language with verb-final order and matrix verb raising, I would like to turn now to the question of the order of constituents preceding the verb, in particular the position of the subject. The word order in Karitiana dependent clauses is SOV in mythical narratives, and OSV otherwise. I assume that the SOV word order reflects an earlier stage of the language, in which the specifier of VP was projected to the left:

29.



The language uses this order as a stylistic variation, which I assume is a PF option, that is, a phonetic variation in the order of constituents used in a certain register (archaic) that crucially does not affect interpretation, and for that reason is not computed by the syntax.

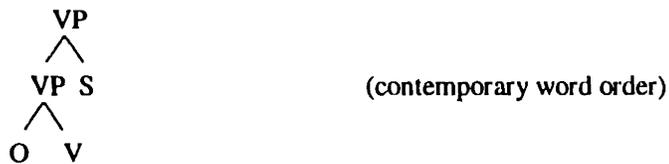
There is evidence that the specifier of VP is projected to the right in contemporary Karitiana. We will see in section 4 that VOS is the most common word order in echo comments³⁵ and narratives, when the subject is a discourse topic, and that SVO is the order of a syntactically focused subject³⁶. Assuming that the preverbal position in matrix clauses is a focus position (cf. section 2) to which the subject raises, it makes sense to

³⁵ Also known as “shadowing”, a speech practice in which the interlocutor repeats what the speaker has just said.

³⁶ This is not to say that whenever SVO word order surfaces the subject is focused. SVO may be used to indicate the pragmatic notion of “newsworthiness” discussed by Mithun (1992).

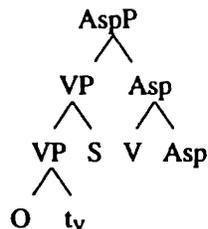
posit that VOS is the word order when the subject is in situ³⁷. This follows naturally if the subject is generated to the right of VP, but not if it is generated to the left:

30.



Note, however, that to derive the colloquial word order in dependent clauses (OSV) under my analysis, the verb must adjoin to the aspectual head. Otherwise, the order would be the unattested OVS:

31.



I assume the structure just presented for dependent clauses is the most adequate for Karitiana because all other possibilities would make the wrong predictions. In order to derive the underlying OSV word order without verb adjunction to Asp, any account would have to posit local movement of the object to VP (or vP³⁸). The adjunction of an object to VP (or vP), however, would predict the wrong results: that adverbs, which

³⁷ Note that ergative subjects are always licensed in situ. Raising of an ergative subject for Case reasons is not an option universally, so it makes sense to imagine that in the absence of a reason to raise (such as checking a focus feature), transitive subjects will stay in situ. Raising ergative languages are those in which the absolutive argument (object or intransitive subject) raises to be Case licensed.

³⁸ Chomsky (1995) posits vP as the projection that hosts the subject in a transitive clause. It takes VP as a complement, and, in nominative-accusative languages, it is responsible for licensing accusative Case.

normally left adjoin to any maximal projection in the language (cf. section 3), would be able to occur between the object and the subject in OSV clauses. Examples (32)-(35) show that adverbs must occur clause-initially in embedded clauses³⁹:

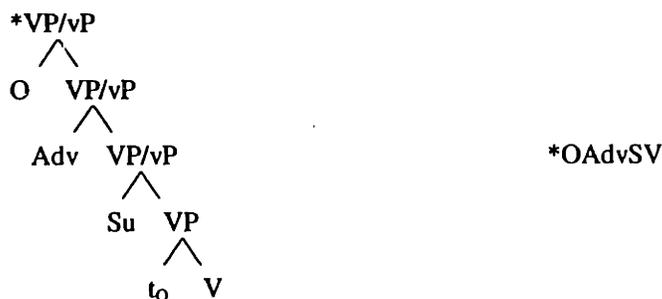
Embedded Clauses:

- | | |
|---|-----------|
| 32. [mynda ysypy'et him okej]
slowly my-uncle meat cut
'..that my uncle cut the meat slowly' | Adv SOV |
| 33. *[ysypy'et mynda him okej]
my-uncle slowly meat cut | *S Adv OV |
| 34. *[ysypy'et him mynda okej]
my-uncle meat slowly cut | *SO Adv V |
| 35. *[ysypy'et him okej mynda]
my-uncle meat cut slowly | *SOV Adv |

(Storto 1997)

I examine the alternatives to my analysis below. The structure in (36) assumes a left-adjoined subject and a verb-final VP, yielding the ungrammatical word order *OadvSV..

36.



³⁹ We will see later in this section that the only dependent clauses that allow adverb adjunction between the object and the subject are head internal relative clauses, which are dependent clauses in which relativized arguments move clause internally to Spec,AspP.

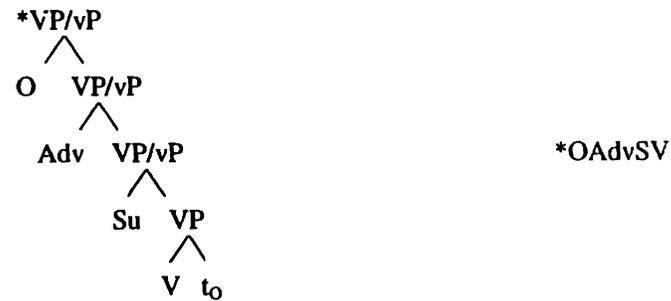
If, instead, the subject were right adjoined, and VP were head-final, an additional problem would arise: embedded clauses would incorrectly be predicted to be subject final as in (37):

37.

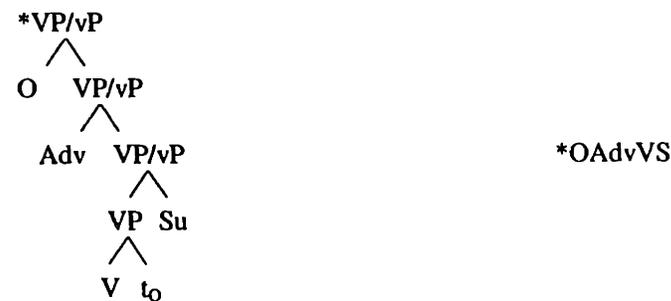


Hypotheses in which VP is head-initial would predict the incorrect results as well, independent of where the subject adjoins:

38.



39.



We must now examine head internal relative clauses and explain how they differ from other subordinates, allowing two sites for adverb adjunction. The internal head of the relative clause raises above VP, presumably to Spec,AspP. Once the argument raises, two positions become available for adverb adjunction: AspP and VP:

40. [OAdv SV]: adverb adjunction to VP

Y-py-so'oot-on	yn	[sosy	mynda	ajxa	ti-oky]-ty
<i>Is-assert-nfut</i>	<i>Is</i>	<i>armadillo</i>	<i>slowly</i>	<i>2p</i>	<i>OFC-kill-obl</i>

'I saw you (pl.) kill the armadillo slowly'
 'I saw the armadillo you killed slowly'

(Storto 1997)

41. Adv [OSV]: adverb adjunction to AspP or adverb constructed with the matrix

Y-py-so'oot-on	yn	mynda	[sosy	ajxa	ti-oky]-ty
<i>Is-assert-nfut</i>	<i>Is</i>	<i>slowly</i>	<i>armadillo</i>	<i>2p</i>	<i>OFC-kill-obl</i>

'I saw you (pl.) kill the armadillo slowly'
 'I saw the armadillo you killed slowly'
 or
 'I gradually saw you (pl.) kill the armadillo'
 'I gradually saw the armadillo you killed'

(Storto 1997)

In (40) the internal head of the relative (the object *sosy*) raises to Spec,AspP, and the adverb is adjoined to VP. The utterance in (41) is ambiguous between a structure in which the adverb is part of the matrix (VSAdv [OSV]) and one in which it is part of the relative, adjoined to AspP (VS [Adv OSV]). This can be confirmed when we compare (41) and (42). In the latter the adverb is clearly part of the matrix clause:

42. Y-py-so'oot-on	yn	[sosy	ajxa	ti-oky]-ty	mynda
<i>Is-assert-nfut</i>	<i>Is</i>	<i>armadillo</i>	<i>2p</i>	<i>OFC-kill-obl</i>	<i>slowly</i>

'I gradually saw you (pl.) kill the armadillo'
 'I gradually saw the armadillo you killed'

(Storto 1997)

The data in (40)-(44) constitutes conclusive evidence that right adjunction of adverbs to maximal projections other than the matrix CP is not an option in Karitiana. If that possibility were open, we would expect to find the word orders OSAdvV and OSVAdv in object head internal relative clauses, which are unattested (cf.(43)-(44)). Right adjunction of an adverb to the embedded VP, as in (43) or to AspP in (44) is ungrammatical:

43. *Y-py-so'oot-on yn [sosy ajxa mynda ti-oky]-ty
Is-assert-nfut *Is* *armadillo* *2p* *slowly* *OFC-kill-obl*
44. *Y-py-so'oot-on yn [sosy ajxa ti-oky mynda]-ty
Is-assert-nfut *Is* *armadillo* *2p* *OFC-kill* *slowly-obl*

(Storto 1997)

We know (40)-(44) are head internal relative clauses because if the object *sosy* were outside the relative we would expect it to be suffixed by the oblique marker *-t(y)*, which marks complements of the verb *so'oot*.

A head external relative clause is shown, for comparative purposes, in (45). The verb *ohit*, as the verb *so'oot* in (40), marks its objects with oblique Case. In the head external relative clause (45) both the external head of the relative and the relative itself are marked oblique, whereas in (45) the relative clause alone is marked oblique (cf. chapter 5 for a head-internal relative with an internal oblique marker):

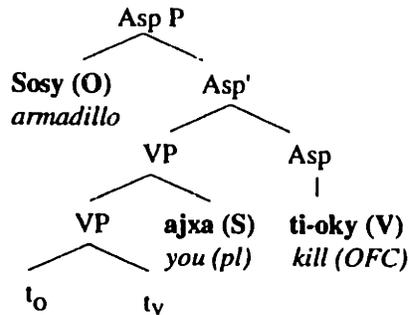
45. Y-pyr-ohit-in yn 'ip-ity [an ti-'y]-t
Is-assert-fish-nfut *Is* *fish-obl* *2s* *OFC-eat-obl*
'I caught the fish for you to eat'

(Storto 1998)

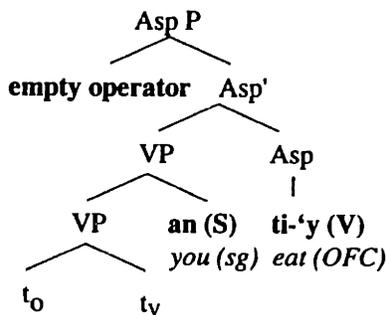
The structural difference between head internal and head external relative clauses is that in the former the head of the relative raises overtly to Spec,AspP, whereas in head

external relatives the head is outside of the relative, coindexed with an empty operator which is internal to the relative, and moves from its base position to Spec,AspP:

46. *Head Internal Relative Clause*



47. *Head External Relative Clause*



Recall that we explained the difference between SOV and OSV in dependent environments as a stylistic variation (archaic versus colloquial, respectively). Head internal relative clauses are the only environments in which this stylistic change in word order does not apply. In these types of relatives the difference is syntactic (the internal head of the relative raises to Spec,AspP):

48. Yn na-aka-t i-so'oot- Ø [ōwā [taso ti-mi]]-ty
 Ip decl-aux-nfut 3ps-see(intr)-nfut [child [man OFC-hit]]-obl.
 'I saw [the child who the man hurt/the child be hurt by the man]'

49. Yn na-aka-t i-so'oot-Ø [taso [ōwā mi]-ty
 1p decl-aux-nfut 3p-see-nfut [man [child hit]-obl.
 'I saw [the man who hurt the child/ the man hurt the child]'

(Storto 1997)

Having argued for an underlying OVS word-order with obligatory raising of the embedded verb to Asp, I now conclude this section with a note about the position of aspectual auxiliaries.

A final point that must be made about the complementary distribution in word order between subordinate and root clauses is the fact that the base position of aspectual auxiliaries must be the same in both environments. This is a generalization based on empirical grounds: the aspectual morphology found in embedded clauses (for instance, the imperfective *tysyp*) is also present in root clauses:

50. [I-soko'i y-tat tysyp-y'oot] a-taka-mew-i
 3-tie.up 1s-go *impfv.aux.-inceptive* 2s-decl-arrive-irr
 'When I am going to tie it up, you will arrive'

51. [I-hadna sogng] myrỹ'in ytakatat tysyp, y-taka-'a ta' āt yn-o
 3-speak since only 1s-decl-go *impfv.aux* 1s-decl-say dir.evid 1s-emph
 'Since he spoke with me, I am going there, I said'

The matrix verb and aspectual auxiliary form a complex head which occupies second position. In dependent environments, aspectual heads are clause-final. If they are generated in this final position, then they must have raised and adjoined to the verb when it is in second position. This suggests that the second structural position to which the verb raises is not I, because I must be the d-structure position of the auxiliary. The conclusion I draw from the data in (50)-(51) is that the landing site of the main verb is not I.

2. Spec, CP as a focus position

Focused arguments typically occupy Spec,CP. This A-bar position is the landing site of all focused arguments in wh-questions, answers to wh-questions, clefts and object focus constructions:

52. Ergative subject in focus position

- | | | | | | | | | | |
|----|----|-----------------------|-----------------------|-----------------|--|--|--|--|-------------------------------------|
| a. | Q: | Mora | i-'y-j | ohy? | | | | | <i>'Who will eat potatoes?'</i> |
| | | <i>wh</i> | <i>3-eat-irr</i> | <i>potato</i> | | | | | |
| b. | A: | Taso | Ø-naka-'y-j | ohy | | | | | <i>'The man will eat potatoes'</i> |
| | | <i>man</i> | <i>3-decl-eat-irr</i> | <i>potato</i> | | | | | |
| c. | A: | * Ø-Naka-'y-j | ohy | taso | | | | | |
| | | <i>3-decl-eat-fut</i> | <i>potatoes</i> | <i>man</i> | | | | | |
| d. | A: | * Ø-Naka'yj | taso | ohy | | | | | |
| | | <i>3-decl-eat-fut</i> | <i>man</i> | <i>potatoes</i> | | | | | |
| e. | A: | ??Ohy | a-taka-'y-j | taso | | | | | <i>'Potatoes, the man will eat'</i> |
| | | <i>potatoes</i> | <i>OFC-eat-irr</i> | <i>man</i> | | | | | |

In (52) I show that the subject must be in preverbal position in answers to subject wh-questions. Verb-initial word orders (cf. (52c) and (52d)) or the declarative version of the object focus construction in (52e) cannot be used as answers in this case.

The declarative object focus construction⁴⁰ in (53) is the ideal answer to an object wh-question. Note that the non-declarative version of the focus construction in (53f) is not a possible in this case because answers to wh-questions must be declarative.

53. *Object in focus position*

- | | | | | | | |
|----|----|---|--|---------------------------------------|--------------------|--------------------------------|
| a. | Q: | Mora-mon
<i>wh-cop</i> | taso
<i>man</i> | ti-'y-t-?
<i>OFC.part-eat-nfut</i> | | <i>'What did the man eat?'</i> |
| b. | A: | Ohy
<i>potato</i> | a-taka-'y-t
<i>passiv-decl-eat-nfut</i> | | taso
<i>man</i> | <i>'Potatoes, the man ate'</i> |
| c. | A: | ?Taso
<i>man</i> | naka-'y-t
<i>decl-eat-nfut</i> | ohy
<i>potatoes</i> | | <i>'The man ate potatoes'</i> |
| d. | A: | * Ø-Naka-'y-t
<i>3-decl-eat-nfut</i> | ohy
<i>potatoes</i> | | taso
<i>man</i> | |
| e. | A: | * Ø-Naka'yt
<i>3-decl-eat-nfut</i> | taso
<i>man</i> | ohy
<i>potatoes</i> | | |
| f. | A: | ??Ohy
<i>potatoes</i> | i-ti-'y-t
<i>3-OFC-eat-nfut</i> | | taso
<i>man</i> | <i>'Potatoes, the man ate'</i> |

Examples (54) and (55) show that focused time expressions and postpositional phrases must occur preverbally:

54. *Time expression in focus position*

- | | | | | | | |
|----|----|-------------------------|--------------------------------------|------------------------------|--|-----------------------------------|
| a. | Q: | Tikat
<i>when</i> | a-ama-j
<i>2s-buy-irr</i> | leite-ty?
<i>milk-obl</i> | | <i>'When will you buy milk?'</i> |
| b. | A: | Dibm
<i>tomorrow</i> | y-ta-ama-j
<i>1s-decl-buy-irr</i> | leite-ty
<i>milk-obl</i> | | <i>'I will buy milk tomorrow'</i> |

⁴⁰ Object focus constructions are discussed in detail in chapter 5.

- c. A: *Leite-ty dibm y-ta-amaj
milk-obl tomorrow 1s-decl-buy-irr
- d. A: *Y-ta-ama-j leite-ty dibm
1s-decl-buy-irr milk-obl tomorrow
- e. A: *Yta-ama-j dibm leite-ty
1s-decl-buy-irr tomorrow milk-obl
- f. A: *Dibm leite-ty ytaamaj
tomorrow milk-obl 1s-decl-buy-irr

55. *Postpositional phrases in focus position*

- a. Q: Tihooop a-ama-j leite-ty? 'Where will you buy milk?'
where 2s-buy-irr milk-obl
- b. A: Lider-pip y-ta-ama-j leite-ty 'I will buy milk at the Lider'
Lider-at 1s-decl-buy--irr milk-obl
- c. A: *Leite-ty y-ta-ama-j Lider-pip
milk-obl 1s-decl-buy--irr Lider-at
- d. A: *Y-ta-ama-j leite-ty Lider-pip
1s-decl-buy--irr milk-obl Lider-at
- e. A: *Y-ta-ama-j Lider-pip leite-ty
1s-decl-buy--irr Lider-at milk-obl
- f. A: *Lider-pip leite-ty y-ta-ama-j
Lider-at milk-obl 1s-decl-buy--irr

(Storto 1997)

To finalize this section, I will examine the two examples of multiple wh-questions that are available in the corpus. Although wh-phrases in-situ are not allowed in Karitiana, it is possible to use a third person pronoun in situ as a way to prime a pair-list answer. This indicates that these sentences function as multiple wh-questions, although they do not employ a wh-phrase in-situ:

56. *Oblique wh in Spec,CP, and third person pronoun in situ*

- Q: Morā-pi-p a-so'oot i-ty-t?
Wh-place-in 2s-see(intr.) 3-obl-?
Where did you see what?' (Where did you see "it"?)

A: Circo-pip y-ta-so'oot elefante-ty, zoologico-pip y-ta-so'oot girafa-ty
Circus-place-in Is-decl-see(intr.) elephant-obl zoo-place-in Is-decl-see giraffe-obl

At the circus I saw an elephant, at the zoo I saw a giraffe'

The answer to the moved wh-phrase “where” is in Spec,CP in (56), as expected. However, a puzzle arises in (57). The way to ask “who killed what” is by moving the object wh-phrase to Spec,CP and leaving the subject pronoun in situ, although the answer has the subject in Spec,CP:

57. *Object wh in spec,CP and third person pronoun in situ*

Q: Mora-mon i ti-oky-t?
Wh-cop 3 OFC-part-kill-nfut

'Who killed what?' (lit.: What did “he” kill?)

A: Jonso na-oky-t sojxa, taso na-oky-t 'irip
Woman decl-kill-nfut pig man decl-kill-nfut tapir

'The woman killed the pig and the man killed the tapir'

Until further research is done on this topic, it is impossible to give an account of (57). For now, the issue must remain open.

3. Adverb adjunction as evidence of verb raising in matrix clauses

Adverbs in Karitiana left-adjoin to maximal projections⁴¹. SVO sentences allow three possible positions for adverb placement: before the subject, between the verb and the object, or after the object, but crucially not between the subject and the verb, arguably because they are in a spec-head configuration⁴²:

Matrix Clauses:

58. Mynda	tasó	na-m-potpora-j	ese	Adv SVO
<i>slowly</i>	<i>man</i>	<i>decl-caus-boil-irr</i>	<i>water</i>	
<i>'The man boiled the water slowly'</i>				

⁴¹ It is still unclear whether all adverbs have the same distribution in the language. At least the adverb “slowly” and the time expression “at noon”, which in English are restricted to VP and IP respectively, in Karitiana do not differ with respect to where they are allowed to occur.

⁴² The same pattern can be found with postpositional phrases:

- | | | | | |
|-----|------------------|-----------------------------|------------------|---|
| 1a. | Y-'it | naka-'a-t | yn-ty | <i>'My father told us'</i> |
| | <i>Is-father</i> | <i>decl-say-nfut</i> | <i>Is-obl.</i> | |
| 1b. | Ynty | naka'at y'it | | |
| 1c. | *Y'it | ynty naka'at | | |
| 1d. | Naka'at | y'it ynty | | |
| 1e. | Naka'at | ynty y'it | | |
| 2a. | Paje | na-kinda oti 'ap | ejepo-ty | <i>'The shaman heals with stones'</i> |
| | <i>shaman</i> | <i>decl-thing_hurt_cure</i> | <i>stone-obl</i> | |
| 2b. | Ejepoty | nakinda oti 'ap paje | | |
| 2c. | *Paje | ejepoty nakinda oti 'ap | | |
| 2d. | Nakinda | oti 'ap paje ejepoty | | |
| 2e. | Nakinda | oti 'ap ejepoty paje | | |
| 3a. | Luciana | naka-hit boete-ty Claudiana | | <i>'Luciana gave the necklace to Claudiana'</i> |
| | <i>decl-give</i> | <i>necklace-obl.</i> | | |
| 3b. | Luciana | nakahit Claudiana boetety | | |
| 3c. | Boetety | nakahit Luciana Claudiana | | |
| 3d. | *Luciana | boetety nakahit Claudiana | | |
| 3e. | Nakahit | Luciana Claudiana boetety | | |
| 3f. | Nakahit | boetety Luciana Claudiana | | |

59. *Taso mynda na-m-poipora-j ese *S Adv VO
man slowly decl-caus-boil-irr water
'The man boiled the water slowly'
60. Taso na-m-potpora-j mynda ese SV Adv O
man decl-caus-boil-irr slowly water
'The man boiled the water slowly'
61. Taso na-m-poipora-j ese mynda SVO Adv
man decl-caus-boil-irr water slowly
'The man boiled the water slowly'

(Storto 1997)

Contrast the pattern of adverb adjunction in matrix clauses with that of embedded clauses below. As seen in section 1 (cf. (32)-(35), repeated here as (62)-(65)), with the exception of head internal relative clauses, dependent clauses have a single position for adverb adjunction: clause-initially:

Embedded Clauses:

62. [mynda y-sypy-'et him okef̄] Adv SOV
slowly my-uncle meat cut
'..that my uncle cut the meat slowly'

The adverb may not occur in non-initial position:

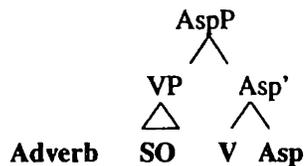
63. *[ysypy'et mynda him okef̄] *S Adv OV
my-uncle slowly meat cut
64. *[ysypy'et him mynda okef̄] *SO Adv V
my-uncle meat slowly cut
65. *[ysypy'et him okef̄ mynda] *SOV Adv
my-uncle meat cut slowly

(Storto 1997)

The difference between adverb adjunction in matrix and subordinate environments can be explained as a result of the fact that verb movement to a second position takes place exclusively in root clauses. When the verb moves, it raises high

enough to make three maximal projections available for adverb adjunction. We saw that, if embedded verbs move at all, they adjoin to the head-final aspectual projection. Therefore, assuming there is no argument movement inside dependent clauses, an adverb will always surface clause-initially, independent of whether it adjoins to VP or AspP. This is illustrated in (66):

66.



In my account (cf. section 1), the embedded verb in (62) adjoins to the aspectual head position to the right of VP (in this case, a null head) without creating an extra position for adverb adjunction, since both VP and AspP are head-final.

Going back to the distribution of adverbs in matrix clauses, it is clear that intransitives show the same pattern discussed above for transitives: adverbs can surface before the verb in (67), between the verb and the subject in (71), and clause-finally (cf.(68)):

- | | | | | |
|-----|------------------|------------------------------------|----------------|--------------------------------|
| 67. | \$Omenda
noon | Ø-nakahyryj-Ø
3-decl-sing-nfut | Gokyp
Gokyp | Adv VS
'Gokyp sang at noon' |
| 68. | Gokyp
Gokyp | Ø-naka-hyryj-Ø
3-decl-sing-nfut | omenda
noon | VS Adv |

69. * Gokyp omenda Ø-naka-hyryj-Ø *S Adv V
 Gokyp noon 3-decl-sing-nfut

(Storto 1997)

Example (69) confirms what we saw in the transitive examples: that there is a prohibition against the occurrence of an adverb between the subject and the raised verb.

The word orders in (70) and (71) occur only in a very specific context: as echo comments to the sentence *mynda nakatari taso* (Adv VS). Echo comments can be defined as a speech practice in which the interlocutor repeats what was said by the speaker. In such contexts, the subject, verb and adverb are topics (old information)⁴³:

70. ? Ø-nakahyryj-Ø Gokyp omenda ?VS Adv
 3-decl-sing-nfut Gokyp noon

71. ? Ø-nakahyryj-Ø omenda Gokyp ?V Adv S
 3-decl-sing-nfut noon Gokyp

(Storto 1997)

The intransitive embedded sentences below confirm what we saw in the transitive cases: that adverbs are limited to clause-initial position (cf.(72)):

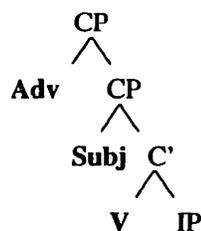
72. \$[Mynda yn opiso tykiri] ... [Adv SV Asp]
slowly Is hear perfve
 'When I hear (something) slowly'

Adverbs occurring between the subject and the verb (cf. (73)), between the verb and an aspectual head (cf. (74)), or clause-finally (cf.(75)) are ungrammatical:

⁴³ In fact, we will see in section 4 that, in a sense, adverb-initial is the only real word order when Spec,CP is not filled by the subject (VS, VSO, VOS).

By now we have enough evidence to conclude that the subject occupies Spec,CP and the verb occupies C in SVO clauses. The head to which the verb raises is not I, because IP is head-final, and the landing site of the verb is the nuclear position of a head-initial projection. We saw in section 2 that the specifier of the maximal projection to which the verb raises is Spec,CP, and that phrases moved to that position are interpreted as focused: for instance, objects moving there for focus or wh-movement obligatorily trigger special focus morphology (*ti-*) on the verb. Since subjects in SVO sentences also move to a clause-initial position because they are focused (VOS order being used when the subject is a topic), it is likely that the highest maximal projection in SVO clauses is CP. Therefore, I conclude that clause-initial adverbs left-adjoin to the clause in SVO clauses:

78.

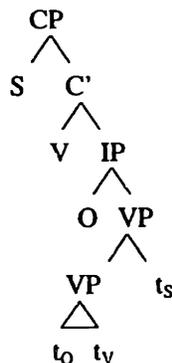


We saw that the other position which adverbs may occupy in SVO sentences is between the verb and the object (cf.(60)) This lead us to the conclusion in (ii): that there is a maximal projection between V and O. The question we must now consider is where the adverb adjoins in sentences with SVAdvO word order. Assuming that S and V are in Spec,CP and C respectively, the object could be either in Spec,IP⁴⁴ or in situ when the word order is SVAdvO. Therefore, even with our constrained theoretical assumptions,

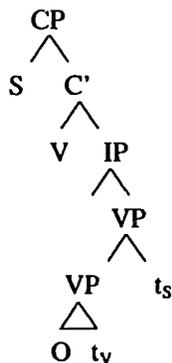
⁴⁴ As a strategy to understand the structure of Karitiana, I adopt a conservative theory of clause structure (Bittner and Hale (1996a, 1996b)), in which the only functional categories available are C and I: this allows as few positions as possible for movement.

there are two possible positions the object could be occupying in SVO clauses: Spec,IP or the base VP internal position:

79. Object in Spec,IP



80. Object internal to VP



If the object is in Spec,IP (cf. (79)), the adverb in SVAdvO sentences is adjoined to IP and that in SVOAdv sentences is adjoined to VP. Conversely, if the object is internal to VP (cf. (80)), the adverb could be either adjoined to IP or to VP in SVAdvO sentences, and we would be forced to say that when the word order is SVOAdv the adverb is right adjoined to the clause. To choose between the two analyses represented in (79) and (80), it is important to consider whether or not Case licensing in Karitiana forces the object to raise to Spec,IP, as objects arguably do in some ergative languages. It makes perfect

sense to hypothesize that the absolutive argument (object and intransitive subject) has to raise for Case reasons in Karitiana, because many ergative languages display that pattern of movement (the ones called “raising ergative” by Bittner and Hale (1996a, 1996b), and “syntactically ergative” by Dixon ((1987), (1994)). This is the hypothesis I suggested in previous work to account for word-order variation in Karitiana (Storto 1997, 1998). However, we will see in chapter 4, that this hypothesis makes the wrong predictions with respect to the pattern of eccentric agreement present in object focus constructions, and for that reason it must be rejected. Another reason to reject this view of Case licensing is its needless complexity when compared with the alternative view: that arguments are licensed in situ (as it is the case in “transparent” ergative languages). We will see in chapter 4 that there is plenty of evidence that Karitiana patterns with transparent ergative languages. For these reasons, I will assume that (80) is the correct surface structure for SVO clauses.

The only unpleasant result of assuming the structure in (80) as a representation of SVO clauses is that it forces us to say that a clause-final adverb is right-adjoined to CP. Note, however, that if we limit right-adjunction to the clause (CP), our theory gains explanatory power, because:

- (i) CPs do not project in subordinate clauses, which explains why there is no possibility of right-adjunction in dependent environments.
- (ii) CP, being the highest phrase, is the only maximal projection in which one would expect freedom of adjunction. Cross-linguistically, clause-initial and clause-final positions have special pragmatic status (Ken Hale, p.c.) Furthermore, some Tupi

languages allow adjunction of “extra” material such as adverbs and PPs to pre or post-clausal position (cf. Moore (1984)).

- (iii) The fact that the language does not distinguish between VP and IP adverbs may follow from the fact that there is no difference between IP and VP adjunction of adverbs in the SVAdv O word order.

In fact, the hypothesis that adverbs may right adjoin to matrix CPs can be corroborated by an example discussed in section 1: the head-external relative clause (42), repeated here as (81):

81. Y-py-so'oot-on yn [sosy ajxa ti-oky]-ty mynda
 1s-assert-nfut *1s* *armadillo* *2p* *OFC-kill-obl* *slowly*

'I gradually saw you (pl.) kill the armadillo'
'I gradually saw the armadillo you killed'

(Storto 1997)

Judging by the interpretation of the sentence, the adverb occurring after the relative clause in this case is crucially outside of that clause and construed with the matrix.

4. Verb-initial word orders and the V-2 effect

In this section I argue that there is a tendency to fill Spec,CP in Karitiana because adverbs occurring in verb-initial sentences must appear preverbally. Verb-initial word orders are very common in the language. VOS is by far the most common of the two orders, and typically occurs in narratives, when the subject tends to be a discourse topic⁴⁶. Subject final word orders also occur in environments in which the subject is uncontroversially a topic: in echo comments and when the object is syntactically focused to Spec,CP in answers to object wh-questions. VSO is a common order in intransitive predicates which take optional oblique objects, but it also occurs occasionally in regular transitive verbs. When that happens, it is not clear what the difference is between the VOS and VSO word orders is. It is clear, however, that VOS is the unmarked order of sentences with unfocused subjects. The optimal status of (81), when compared with (82), corroborates this claim:

⁴⁶ The problem with narratives is that they induce pragmatically motivated word orders which are not yet clearly understood. For instance, they may have verb-initial word orders when the subject is new information (perhaps because Spec,CP in these cases is filled by the clausal conjunction *morasong*, which can be translated as “and then”), or use SVO to indicate “newsworthiness” rather than focus of the subject. Mithun (1992) points out that, crosslinguistically, “constituents may be newsworthy because they introduce pertinent new information, present new topics or indicate a contrast” (pg. 58).

81. \$ Mynda	Ø-na-m-potpora-j	ese	ĵ onso	Adv VOS
<i>slowly</i>	<i>3-decl-caus-boil-irr</i>	<i>water</i>	<i>woman</i>	
'The woman will boil the water slowly'				
82. Mynda	Ø-na-m-potpora-j	ĵ onso	ese	Adv VSO
<i>slowly</i>	<i>3-decl-caus-boil-irr</i>	<i>woman</i>	<i>water</i>	
83. * Ø-Na-m-potpora-j	ĵ onso	ese	mynda	*VSO Adv
<i>3-decl-caus-boil-irr</i>	<i>woman</i>	<i>water</i>	<i>slowly</i>	
84. * Ø-Na-m-potpora-j	ese	ĵ onso	mynda	*VOS Adv
<i>3-decl-caus-boil-irr</i>	<i>water</i>	<i>woman</i>	<i>slowly</i>	
85. * Ø-Na-m-potpora-j	ese	mynda	ĵ onso	*VO Adv S
<i>3-decl-caus-boil-irr</i>	<i>water</i>	<i>slowly</i>	<i>woman</i>	
86. * Ø-Na-m-potpora-j	ĵ onso	mynda	ese	*VS Adv O
<i>3-decl-caus-boil-irr</i>	<i>woman</i>	<i>slowly</i>	<i>water</i>	

(Storto 1997)

Verb-initial word orders are different from SVO word-orders with respect to adverb adjunction: adverbs must occur preverbally if the clause is verb-initial. I interpret this fact as follows: in VSO and VOS sentences, adverbs, when present, have to substitute into Spec,CP:

87. Mynda	Ø-naka-tar-i	taso	Adv VS
<i>slowly</i>	<i>3-decl-go-irr</i>	<i>man</i>	
'The man left slowly'			
88. *Taso	Ø-naka-tar-i	mynda	*SV Adv ⁴⁶
<i>man</i>	<i>3-decl-go-irr</i>	<i>slowly</i>	
89. *Taso	mynda	Ø-naka-tar-I	*S Adv V
<i>man</i>	<i>slowly</i>	<i>3-decl-go-irr</i>	
90. *Mynda	taso	Ø-naka-tar-i	*Adv SV
<i>slowly</i>	<i>man</i>	<i>3-decl-go-irr</i>	
91. ?Ø-Naka-tar-i	taso	mynda	?VS Adv
<i>3-decl-go-irr</i>	<i>man</i>	<i>slowly</i>	
92. ?Ø-Naka-tar-i	mynda	taso	?V Adv S
<i>3-decl-go-irr</i>	<i>slowly</i>	<i>man</i>	

⁴⁶ The order SVAdv is not ruled out by all verbs, a fact I do not understand.

Sentences (91) and (92) are only grammatical as echo comments to the sentence *mynda nakatari taso* 'the man will go slowly'. As mentioned before, echo comments are by definition contexts in which the subject, object, and in these cases the adverb, are old information.

I assume that adverbs are forced to substitute into the specifier of CP in verb-initial clauses because there is a principle operating in the language that requires the first position be filled. This is what I call the verb second (V-2) effect in Karitiana. Verb second is a generalized phenomenon in Germanic languages⁴⁷ consisting of movement of the finite verb to the second structural position in the clause (Vikner 1995). Another characteristic of what has been described as the V-2 phenomenon is the obligatory presence of a phrase in first position - the specifier of the head to which the verb raises. The most widely accepted analysis of V-2 assumes that the second position is C (Den Besten (1977)). This explains the complementary distribution in word order between matrix and dependent clauses found, for instance, in German, a verb-final language in which the verb is the second constituent in all root clauses, and the last constituent in subordinates. The simple version of the argument is that in subordinate clauses the presence of an overt complementizer prevents verb movement to C. There is no agreement in the literature, however, as to how verb raising correlates with the filling of the preverbal position. Some specialists tried to give syntactic explanations for the phenomenon, suggesting either that the independently motivated movement of a phrase to Spec,CP triggers verb movement to C, or that the movement of the verb triggers phrasal

⁴⁷ With the exception of English, where V-2 is residual, occurring in wh-questions and negation.

movement to the specifier of CP. Whatever version of these theories one picks cannot be used to explain the tendency to fill the specifier of CP in Karitiana, because verb-initial orders do exist in the language.

Although V-2 in Karitiana shares some features with V-2 in German, the phenomenon has different properties in the two languages. We saw that verbs invariably raise in Karitiana matrix clauses. However, the presence of a phrase in the specifier of CP is not obligatory in Karitiana as it is in German. We saw that verb-initial word orders, specially VOS, are very common in narratives, whereas in conversations SVG is far more common. If it is correct to identify the tendency to fill Spec,CP in Karitiana with the V-2 phenomenon, one thing is clear: the principle that guides this tendency is far stronger in German than it is in Karitiana. I would like to explore the possibility that the presence of a phrase in Spec,CP is a phonological process, which is obligatory in German, but only a tendency in Karitiana. The reader should bear in mind that what follows is a highly speculative analysis, since it is still to be determined exactly how this tendency to fill Spec,CP is to be characterized in Karitiana.

In section 2, I gave evidence that Spec,CP is a position associated with focus semantics. The idea is that phrases must move to Spec,CP to be syntactically focused (wh-movement, focus, etc.). In these cases the relationship between C and its specifier is clear: a focus feature in C attracts the focused phrase to its specifier. It is not clear, however, whether the first position always has focus semantics. For instance, it is still to be discovered whether adverbs or postpositional phrases in Spec,CP must necessarily be focused.

There is yet another type of focus in Karitiana clauses, which I shall call sentential focus. Sentential focus can be described as the primary stress of a sentence (default stress). Cinque (1993) hypothesizes that this type of focus falls cross-linguistically in the most deeply embedded constituent in a sentence. Indeed, this generalization holds in Karitiana: in transitive verbs, the object is stressed, in intransitives, the subject, and in ditransitives, the oblique theme.

The Karitiana facts can possibly be explained as a result of the interaction between two phonological processes⁴⁸ (sentential focus and the “filling” of spec,CP), and one syntactic process, which involves A-bar movement of a focused constituent to Spec,CP (for a discussion of object focus constructions, see chapters 5 and 6).

I claim that the process computing sentential focus always applies, whereas the one which enforces the filling of Spec,CP applies whenever possible, that is, whenever it does not interfere with the intended interpretation. This ensures that Spec,CPs will be left empty when the subject is a topic, that is, when there is no syntactic movement of the subject to first position. If an argument is already focused by syntactic rule, it will appear in Spec,CP and satisfy the phonological requirement that the position be filled. We must now explain when the process that fills Spec,CP fails to apply.

This process will force Spec,CP to be filled in matrix clauses only, explaining the tendency that adverbs (and also postpositional phrases, and embedded clauses) have to appear in that position. In subordinate clauses this process is not operative, because CP does not project. This rule is purely phonological, in the sense that phrases in that position do not have to be interpreted as focused. When the overt subject is not a

discourse topic, SVO clauses are common because the subject syntactically moves to the specifier of the head bearing a focus feature (Spec,CP) to be interpreted as new information. Note that this movement does not violate sentential focus, since syntactic and prosodic focus are clearly separate entities. That is, in environments in which syntactic focus applies (wh-movement, answer to wh-questions, and focus movement in general), it always applies, independently of whether the focused argument already has sentential focus or not. Also, it is likely that, in some cases, movement of the subject in SVO word order will be a result of the application of the phonological rule that fills Spec,CP; in those cases, we do not expect the subject to be interpreted as new information. Indeed, we saw that SVO word order may be used pragmatically to indicate “newsworthiness”, which is a different notion than focus.

There is an interesting difference in word-order between transitive and intransitive sentences which can be captured by our account: in contexts where SVO sentences are common, such as conversations, most intransitive sentences are VS. That is, the intransitive subject raises less to Spec,CP than the transitive subject. I assume this can be explained by Cinque’s algorithm of default focus: intransitive subjects, unlike transitive subjects, receive sentential focus. Therefore, movement of the intransitive subject is not necessary when the pragmatic interpretation of “newsworthiness” is the goal of the speaker, which is not the case with transitive subjects. Only when syntactic focus applies, such as in wh-questions or answers, do intransitive subjects raise preverbally, whereas transitive subjects also raise to escape a topic interpretation.

⁴⁸ Syntax plays only an indirect role here, as syntactic objects are mapped into phonological objects.

CHAPTER 4 - AGREEMENT IN C

0. Introduction

The goal of this chapter is to account for the ergative pattern of agreement in Karitiana. Matrix clauses in the language show ergative agreement according to the following pattern: (i) in intransitive clauses, the subject agrees with the verb; (ii) in transitive clauses, the object agrees with the verb⁵⁰. This pattern surfaces in all matrix clauses in the language, except in the object focus construction, where the transitive verb eccentrically agrees with the ergative argument. Since the object focus construction does not involve intransitivization of the verb, a change in the agreement pattern seems at first sight rather puzzling. I show that the Case Binding theory developed by Bittner (1994) and refined in Bittner and Hale (1996a, 1996b) accounts for these facts both synchronically and diachronically⁵¹.

⁵⁰ David Landin, an SIL missionary who studied Karitiana before me, was the first person to identify the language as ergative (Landin 1984). My analysis differs from his in that I analyze as agreement the proclitics which he described as pronominal. Landin also overlooked the complementary distribution between matrix and dependent clauses with respect to the position of the verb, claiming SVO was the basic word order of the language. He and his wife Rachel Landin wrote a series of working papers published by SIL (Landin, D. 1987, 1988, Landin, R. (1982, 1989), Landin, D. and R. Landin (1973)), as well as a small dictionary (Landin, D. 1983). I refrain from discussing their work in this thesis because of the types of problems mentioned above. Another person who wrote papers on the syntax of Karitiana is Daniel Everett (Everett 1986, 1993). Since Everett assumed Landin's description of Karitiana syntax to be correct, his papers are of very little use to me as well.

⁵¹ The account proposed in this chapter was first suggested by Hale and Storto (1997). In that paper, however, I erroneously analyzed the focus construction as an object topicalization construction (OTC), because I was under the impression that the position to which the verb raises was lower than C. I did not understand at the time that object wh-clauses are clefts (cf. chapter 5).

Synchronically, the main descriptive generalization that the theory is able to capture is that eccentric agreement is a direct result of the presence of object focus morphology. Specifically, the insertion of a focus marker in these clauses destroys the covert agreement relationship that the functional head I would otherwise have with the ergative argument, thus “freeing” that argument to agree with the other functional head which bears agreement features in the language: C. In this theory, C is the head normally associated with nominative agreement. In the object focus construction C agrees with the ergative argument instead, arguably because the agreement features of I are wiped out by the insertion of the focus morpheme. Direct evidence that eccentric agreement results from the insertion of focus morphology is absent in Karitiana. However, we will see that the Mayan language K’ichee’ has an agent focus construction with eccentric agreement whose focus morphology replaces one of the agreement slots on the verb. In K’ichee’, active sentences have two loci for agreement, whereas in the focus construction a single locus is present.

Since the definition of agreement in the Case Binding theory allows for a given functional head to agree with different arguments in different syntactic configurations, it is able to account for the switch in agreement pattern triggered by the deactivation of the relevant features in a functional head.

Diachronically, transitive focus constructions such as the Karitiana object focus construction can be explained as a result of grammaticalization (in the sense of Meillet (1912)). The idea is that the focus morphology present in ergative focus constructions historically originate from a reanalysis of antipassive morphology. The morpheme of

category N which in an antipassive takes the place of the patient, is grammaticalized in a focus construction as inflectional morphology (of category I). There is strong evidence for this hypothesis in the Mayan language K'ichee', where an antipassive and a transitive agent focus construction coexist, marked by homophonous morphology.

I will show that although Karitiana does not have an antipassive, the Tupi language Mekéns has both an antipassive and an object focus construction marked by homophonous morphology, which is cognate with the morphology marking the Karitiana object focus construction. The Mekéns facts alone cannot be used as corroboration that the Karitiana object focus construction originated as an antipassive.

The grammaticalization process probably dates back to Proto-Tupi, because at least four out of the ten families comprising the Tupi stock, have focus constructions: the Arikém family (language: Karitiana), the Tupari family (language: Mekéns), the Ramarama family (language: Karo), and the Tupi-Guarani family (many languages⁵²). Therefore, Tupi languages are potentially interesting sources of data on this specific kind of grammaticalization, as well as on theoretical issues related to focus constructions such as Case, agreement and voice.

Sections 1 and 2 review the data on agreement shown in chapter 3. In section 1 I present evidence that the Karitiana verb agrees with the absolutive argument. In section 2, I remind the reader that movement of V to C correlates with the presence of nominative agreement. Section 3 introduces the apparently exceptional agreement pattern in the non-declarative object focus construction, in which the verb agrees with the

⁵² Judging by a paper by Doris Payne (1994), in which she identifies inverse constructions with focus semantics, as well as by Rodrigues' analysis of Tupinamba personal markers (Rodrigues (1990)), it is safe to say that Tupi-Guarani languages also have focus constructions marked by morphology which is homophonous with passives and/or antipassives.

ergative argument. The section also demonstrates two important characteristics of the object focus construction: (i) that the construction is transitive, as opposed to antipassive, in which agreement with the subject would not be exceptional; (ii) that the verb is in C. The account of eccentric agreement mentioned above will be presented in detail in section 4.

1. Ergative-nominative agreement

We saw in chapter 3 that Karitiana has an ergative pattern of agreement: the verb agrees with the object and with the intransitive subject. This type of agreement is normally called absolutive in the literature on Case. However, I shall use the term nominative to refer to absolutive Case and agreement⁵³. In the declarative sentences (1)-(3) below, transitive verbs agree with their objects, and in (4)-(7) intransitive verbs agree with their subjects:

- | | | | |
|----|---|------------------------|--------------------------|
| 1. | Yn a-ta-oky-j
<i>1s 2s-decl-kill/hurt-irr 2s</i> | an | 'I will hurt you' |
| 2. | An y-ta-oky-t
<i>2s 1s-decl-kill/hurt-nfut</i> | yn
<i>1s</i> | 'You will hurt me' |
| 3. | Yjxa Ø-na-ahee-t
<i>1p. 3-decl-blow-nfut</i> | iso
<i>fire</i> | 'We-incl. blew the fire' |
| 4. | Y-ta-opiso-t
<i>1s-decl-listen-nfut</i> | yn
<i>1s</i> | 'I listened' |
| 5. | A-ta-opiso-t
<i>2s-decl-listen-nfut</i> | an
<i>2s</i> | 'You listened' |
| 6. | Aj-taka-tar-i
<i>2p-decl-leave-irr</i> | ajxa
<i>2p</i> | 'You-pl will leave' |
| 7. | Ø-Naka-hÿryja-t
<i>3-decl-sing-nfut</i> | i/taso
<i>3/man</i> | 'He/the man sang' |

⁵³ See section 4 for a justification of this choice within Bittner and Hale (1996a, 1996b).

Examples (8) and (9) are transitive and intransitive non-declaratives, respectively, in which the same agreement pattern holds:

8. An i-oky-Ø!
 you 3-kill-imp.
 'Kill it!' (imperative)
9. A-tar-a!
 2s-go-imp.
 Go away! (imperative)

I assume that this pattern of agreement can be understood as a reflex of the ergative Case system of the language. Although Karitiana does not mark Case in its arguments overtly, it is clear from the agreement patterns above that the Case system differentiates between ergative versus non-ergative arguments. Further evidence for ergativity in Karitiana is found in *wh*-movement, where, in nonfuture tenses⁵⁴, extraction of objects and intransitive subjects trigger the insertion of the copula verb *mon* in C, whereas extraction of ergative or oblique arguments do not:

Object extraction

- | | | | | |
|-----|---------------|------------|----------------------|------------------------|
| 10. | Mora-mon | taso | ti-pisogng? | 'Who did the man stab? |
| | <i>Wh-cop</i> | <i>man</i> | <i>OFC-part-stab</i> | |
| 11. | Mora-mon | i | ti-pisogng? | 'Who did he stab? |
| | <i>Wh-cop</i> | <i>3</i> | <i>OFC-part-stab</i> | |

⁵⁴ The only tense marker that clearly marks tense in Karitiana is the nonfuture suffix. There is a morpheme commonly found in clauses translated as future (*-i/-j*), which I labeled "irrealis" because it also occurs in nonfuture environments.

Intransitive subject extraction

12. Mora-mon i-hyryp? 'Who cried?'
Wh-cop part-cry

Transitive subject extraction

13. Morā i-sokō'i eremby? 'Who tied up the hammock?'
Wh 3-tie.up hammock

14. Morā y-sokō'i? 'Who tied me up?'
Wh 1s-tie.up

Oblique object extraction

15. Morā-ty aj-andyj? 'Who did you laugh at?'
Wh-obl 2p-smile

I will show in chapter 4 that the presence of the copula *mon* is not the only difference between nominative wh-extraction and other kinds of wh-extraction. Nominative wh-clauses are cleft constructions⁵⁵, whereas other wh-clauses are not.

⁵⁵ This fact explains the use of participials nominalizing the verb in the predicate of the clefts in (10)-(12).

2. Movement of V to C correlates with the presence of nominative agreement

We saw in chapter 3, section 1, that agreement is absent in embedded clauses, in which the verb fails to raise to C, whereas in matrix clauses the verb raises to C and displays agreement. The data is repeated below for convenience:

Transitive main clauses with agreement:

16. Taso i-oky-t boroja *'The man killed the snake' (non-decl)*
 man 3-kill-nfut snake

17. Taso Ø-na-oky-t boroja *'The man killed the snake' (decl)*
 man 3-decl-kill-nfut snake

Transitive main clause without agreement

18. *Taso oky(-t) boroja
 man kill(-nfut) snake

Examples (16)-(18) show that agreement is obligatory in matrix clauses. By contrast, dependent clauses are ungrammatical if agreement is present (cf. (19)-(22)):

Transitive embedded clauses without agreement:

19. [Boroja taso oky tykiri] Ø-naka-hyryp- Ø ōwā
 snake man kill perfve 3-decl-cry-nfut. child
'When the man killed the snake, the child cried' (colloquial)

20. [Taso boroja oky tykiri] Ø-naka-hyryp- Ø ōwā
 man snake kill perfve 3-decl-cry-nfut. child
'When the man killed the snake, the child cried' (archaic)

(Storto 1997)

Transitive embedded clauses with agreement:

21. *[Boroja taso i-oky tykiri] Ø-naka-hyryp- Ø ōwā
 snake man 3-kill perfve 3-decl-cry-nfut. child

22. *[Taso boroja i-oky tykiri] Ø-naka-hyryp- Ø ōwā
 man snake 3-kill perfve 3-decl-cry-nfut. child

The following sentences are ungrammatical because the subordinate clauses are not verb final:

Transitive embedded clauses with or without agreement:

- | | | | | | | | |
|-----|-----------------------|---------------------|-----------------|-------------------|------------------------------------|--------------|--------|
| 23. | *[(I-)oky
(3-)kill | taso
man | boroja
snake | tykiri]
perfve | nakahyryṅ
3-decl-cry-nfut. | ōwā
child | *[VSO] |
| 24. | *[(I-)oky
(3-)kill | boroja
snake | taso
man | tykiri]
perfve | nakahyryp
3-decl-cry-nfut. | ōwā
child | *[VOS] |
| 25. | *[Boroja
snake | (i-)oky
(3-)kill | taso
man | tykiri]
perfve | ∅-naka-hyryp-∅
3-decl-cry-nfut. | ōwā
child | *[OVS] |
| 26. | *[Taso
man | (i-)oky
(3-)kill | boroja
snake | tykiri]
perfve | ∅-naka-hyryp-∅
3-decl-cry-nfut. | ōwā
child | *[SVO] |

The agreement patterns exemplified in (16)-(22) for transitive sentences is also true of intransitives:

Intransitive main clause with agreement

- | | | | | |
|-----|----------------------------|-----------|--|--------------|
| 27. | Y-ta-opiso-t | (yn) | | 'I listened' |
| | <i>1s-decl-listen-nfut</i> | <i>1s</i> | | |

(Storto 1997)

Intransitive main clause without agreement

- | | | | |
|-----|-------------------------|-----------|--|
| 28. | *Ta-opiso-t | (yn) | |
| | <i>decl-listen-nfut</i> | <i>1s</i> | |

Intransitive embedded clause without agreement

- | | | | | |
|-----|------------------|---------------------------|-----------|-------------------------------|
| 29. | [Yn opiso] | a-taka-kārā-t | an | 'You thought that I listened' |
| | <i>1s listen</i> | <i>2s-decl-think-nfut</i> | <i>2s</i> | |

Intransitive embedded clause with agreement

- | | | | |
|-----|---------------------|--------------------------|-----------|
| 30. | *[Y-opiso yn] | a-taka-kārā-t | an |
| | <i>1s-listen 1s</i> | <i>2-decl-think-nfut</i> | <i>2s</i> |

(Storto 1997)

In chapter 3, I assumed that the position to which the verb raises in root clauses is C for two reasons: (i) both VP and IP are head-final, but the matrix verb appears in a

head-initial projection; (ii) the specifier of the head position in which the verb surfaces in matrix clauses is the landing site of focus and wh-phrases.

These facts are consistent with the hypothesis that C has Case, person and number features which appear on verb when it overtly raises to that position. In the remainder of this chapter I will show that there is empirical corroboration for this hypothesis in the eccentric agreement pattern of the object focus construction. In these cases, the agreement surfacing on the verb is ergative, instead of the standard nominative. We will see that this apparently exceptional pattern can be explained if, in these constructions the Case, person and number features of C are checked by the transitive subject instead of the object. The syntactic configuration of the object focus construction allows C to check the features of the transitive subject for the following reasons: the functional head I, which normally agrees with the transitive subject, has its features deactivated by the insertion of focus morphology, and C ends up agreeing with the subject because it is the closest argument bearing unchecked Case, person and number features.

3. An apparent exception to nominative agreement: the object focus construction

Karitiana has a construction involving A-bar movement of the object to a clause-initial position in both matrix and subordinate *non-declarative*⁵⁶ clauses, with an associated overt morphology. This construction is marked by the presence of the verbal prefix *ti-* and occurs in three syntactic environments: (i) when an object is focused, (ii) in relative clauses headed by an object and (iii) when there is wh-movement of an object. I assumed that the A-bar position associated with this movement is the specifier of CP in matrix clauses and the specifier of AspP in subordinate environments (see chapter 3, sections 1 and 2, for a justification). One interesting question raised by the object focus construction is the eccentric pattern of agreement found in type (i) syntactic environments, where the transitive verb agrees with the ergative subject (cf.(31)-(34)), contrary to what is expected in matrix:

Eccentric agreement

31. Sepa y-ti-m-'a ty-ja-t 'A basket, I am weaving'
basket 1ps-OFC-caus.-do imperfve.sitting-nfut
32. 'Ep aj-ti-pasagngã-t ajxa 'Trees, you-pl are counting'
trees 2pl-OFC-count-nfut 2pl

⁵⁶ Non-declarative clauses include exclamatives, negatives, imperatives, interrogatives, quotes, and direct speech. Declarative clauses are always prefixed by *na(ka)-/ta(ka)-* and mark a statement that the speaker believes to be true. The augmentative *ka-* is used when the verb has initial stress, and it is absent otherwise. *Ta(ka)-* is the allomorph used when the declarative verb is prefixed by overt agreement, whereas *na(ka)-* prefixes the verb when agreement is null. There is also an idiosyncratic use of *ta(ka)-* in environments where *na(ka)-* would be expected to occur. The idiosyncratic meaning contributed by the declarative morpheme in these cases is that of an evidential: the speaker is asserting that he or she has no direct visual evidence of what he or she is saying. For instance, in a context in which the speaker knows that João left for a hunting trip, when hearing a shot in the distance, the speaker could say:

- (1) Ø-taka-pon João
3-decl-shoot João
 'João shot'

- | | | | | |
|-----|--|----------------------------|------------------------------|---------------------|
| 35. | x-at-uu-kunaj
<i>Asp-2s(O)-3s(S)-cure</i> | at
<i>you.SG</i> | lee achi
<i>the man</i> | ‘The man cured you’ |
| 36. | x-Ø-kuna-n
<i>Asp-3s-cure-AP</i> | lee achi
<i>the man</i> | ch-aaw-ee
<i>TO-2s-RN</i> | ‘The man cured you’ |
- (Hale & Storto 1997)

In the active sentence (35), the verb is marked by both subject (3rd person) and object (2nd person) agreement. Ergative subject agreement, as expected, occurs closer to the verb root than nominative object agreement. In the antipassive sentence (36), conversely, the subject of the sentence is the agent NP *lee achi*, the patient being the oblique NP *chaawee*⁵⁸. In antipassives, agreement is predictably controlled by the subject of the intransitive clause. Since verbs which undergo the active-antipassive alternation must be underlyingly transitive, it is not uncommon to find in the Mayan literature a confusion between antipassives and transitive focus constructions with eccentric agreement (Mondloch (1981), Davies and Sam-Colop (1990), Larsen (1987, 1988), Pye (1988), Trechsel (1993)). The misidentification happens because both types of clauses are marked by homophonous morphology and oblique arguments can be dropped in the antipassive.

Note that the eccentric ergative agreement in the Karitiana object focus construction (cf. (31)-(34)) could potentially be mistaken for nominative agreement in an antipassive if Karitiana were a language in which oblique objects are unmarked morphologically. However, oblique objects are typically marked by the suffix *-ty* in the language, and the object of an object focus construction cannot be dropped, indicating that the construction is indeed transitive:

⁵⁸ The K'ichee' antipassive is called "absolute antipassive" by Larsen (1987).

37. Boet i-ti-m-'a-t ĵonso 'It was the necklace that the woman made'
 necklace 3-OFC-caus-do-nfut womaŋ

38. *I-ti-m-'a-t ĵonso
 3-OFC-caus-do-nfut woman

(Storto 1997)

Another way one can be sure of the transitive status of the OFC is due to the presence of the obligatory nominative copula *mon* in the matrix C whenever there is wh-movement of an object or intransitive subject (cf. (10)-(12)). Non-nominative wh-phrases, including oblique arguments, pattern alike in that they do not require a copula (cf. (13)-(15), as well as (39)):

39. Morā-ty aj-pytagng ty-ĵa? 'What are you stealing?'
 Wh-obl 2pl-steal imperfve-sitting

40. Mora-mon taso ti-amang ty-ka? 'What is the man planting?'
 wh-cop man OFC.part-plant imperfve-motion

41. Mora-mon i-hyryp ty-ka? 'Who is crying?'
 Wh-cop part-cry imperfve-motion

The oblique object extracted in (39) differs from the extracted direct object in (40) in that only the latter triggers the appearance of object focus morphology and the copula construction. This is uncontroversial evidence that a focused wh-object triggering the object focus construction is not an oblique. I conclude that object focus constructions are transitive.

4. Theoretical Background

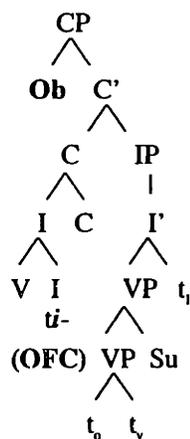
Before I discuss the formalisms of the Case Binding Theory, I will present a simplified version of the theory by introducing the four main points of theoretical interest raised by the object focus construction:

- (i) Eccentric agreement seems to be a result of the insertion of focus morphology.

We will see that this fact is not as obvious in Karitiana as it is in K'ichee'. K'ichee' is an ergative language which has two loci of agreement on the verb in active sentences, and a single locus in agent focus constructions with eccentric agreement. I take this as strong evidence that the presence of focus morphology takes the place of one of the functional heads involved in agreement. As it is the case in ergative languages, active clauses in K'ichee' have ergative agreement appearing closer to the verb than nominative agreement. This is evidence that the functional head involved in checking ergative agreement is lower in the structure than the head responsible for checking nominative agreement. I adopt from Bittner and Hale the assumption that the two functional heads involved in licensing Case and checking agreement in ergative languages are I and C. I, being lower than C, is the head responsible for ergative Case, and C is responsible for nominative Case. These Case relations are normally reflected in agreement relations. For instance, in Karitiana the agreeing head is C, and the argument it normally agrees with is the one bearing nominative Case (object or intransitive subject). However, in focus

constructions in K'ichee' and Karitiana agreement does not reflect Case relations. The only relation that changes with the insertion of focus morphology is agreement. In K'ichee' it is impossible to know which head loses its capacity to agree, because the focus morphology is a suffix, and agreement markers are prefixes. In Karitiana, however, we know that C is still active after focus morphology is inserted, because those constructions have agreement, and C is the only functional head which agrees overtly in the language. This indicates that the locus of the focus morpheme is I in the Karitiana focus constructions (OFC) with eccentric agreement:

42. Object focus construction (s-structure)



In a theory in which syntactic objects are formed by the operation merge, all that has to be said to explain agreement patterns in Karitiana transitive clauses is “agree with the closest argument which hasn’t been agreed with yet”. This explains why I agrees with the transitive subject and C agrees with the object in active sentences, as well as why C agrees with the subject when I is unable to agree. The problem with this simplified version of the theory is that it makes the wrong prediction with respect to intransitive

subjects: that the head involved in agreement is I. We will see that this is why we need the notion of “Case-competitor” (cf. (44)) utilized by the Case Binding theory – to make sure that intransitive subjects will get the same Case as objects because they lack a Case competitor.

To explain eccentric agreement in the focus constructions in K’ichee’ and Karitiana, Hale and Storto (1997) analyze the prefix *ti-* as an inflectional head (of category I), which substitutes or saturates the agreement features that normally motivate ergative agreement in I. In this way, the morphology introduced in inverse sentences frees the ergative argument from the agreeing relation that it has with I, enabling this argument to agree with the other functional head which has agreement features: C.

(ii) Cross-linguistically, the phenomenon of “agreement blocking” by focus morphology is not related to A-bar movement of a particular argument. That is, the phenomenon is not linked to movement of an argument bearing a specific grammatical relation.

Once again, the comparison of the focus constructions in Karitiana and K’ichee’ is useful. In Karitiana, the focus construction arises when an object is A-bar moved to a clause-initial position for focus, wh-movement or relativization. In K’ichee’, it is not the object, but the transitive subject that is focused.

- (iii) Agreement may be non-overt, but nonetheless it is true agreement.

Although Karitiana has a single slot for agreement on the verb, we must say that the language nonetheless has two loci of agreement (one covert and one overt) to explain why, when the focus morphology is inserted, agreement relations are altered. My account of this phenomenon is as follows: when the object is focused, I becomes inactive for agreement purposes because the focus morphology takes the place of agreement in I. Since in this configuration (cf. (42)) a head must agree with “the closest argument which hasn’t been agreed with”, the argument which ends up agreeing with C is the transitive subject, which is the closest argument governed by C (the subject is positioned above the trace of the object at s-structure, where agreement holds). This presupposes that there is covert agreement between I and the ergative subject in matrix clauses – otherwise C would always agree with the transitive subject.. It is only when that agreement relation is interrupted by blocking morphology that eccentric agreement shows up.

- (iv) Case relations in the object focus construction are the same as in active clauses, but these two clause types differ with respect to agreement.

This suggests that there is no necessary link between agreement and Case. In the object focus construction, C still licenses nominative Case in the object, although it agrees with the ergative subject, and I, having lost its agreeing powers, still licenses ergative Case in the subject. Furthermore, there is no one-to-one relationship between a

functional head and a given argument with respect to agreement. That is, a functional head may have an agreement relationship with one argument in a given structure and with a different argument in another structure. For instance, C agrees with the nominative object in active sentences, and with the ergative subject in object focus constructions. In fact, we will see that, if certain conditions hold, a given functional head may agree with either argument in the same structure. In K'ichee', where a person hierarchy is operative (1,2>3), the sole locus of agreement in focus constructions may show subject or object features, depending on the hierarchy. For instance, a third person argument will not agree with the verb in the focus construction if the other argument bears first or second person⁵⁹.

Having introduced the topics of theoretical interest raised by focus constructions with eccentric agreement, I will now present a formal account of the phenomenon. The Case Binding theory of Bittner (1994), adopted and further developed in Bittner and Hale (1996a, 1996b), explains why agreement is eccentric in the object focus construction. The definitions of Case and agreement in this theory are determined configurationally at s-structure in such a way that it is possible for an inverse and an active sentence license Case in exactly the same way, and have opposite agreement patterns. The formalization of these notions is represented in (43)-(47) and explained in the subsequent paragraphs⁶⁰:

⁵⁹ The hierarchy is slightly more complicated than that: second person formal behaves like third person.

⁶⁰ This is a simplified version of the theory. For the complete, and more formalized account, consult Bittner and Hale (1996a, 1996b).

43. Case: (a) Case Filter: A DP must be governed by a Case-like head (that is, C or K).
 (b) Case-binding: Structural K (Case, and the phrasal projection KP, which it heads) must be antecedent governed by an appropriate head.
44. Appropriate Case-binding antecedent: H is an appropriate antecedent for A iff all of the following conditions are met:
 (a) H either projects or governs a “small clause” containing A.
 (b) H locally c-commands A.
 (c) H governs a Case-Competitor of A.
45. Small Clause: A phrase to which a distinguished adjunct is attached (this is the structural relationship of predication, where the adjunct is the subject of the phrase).
46. Distinguished adjunct: The adjunct of a maximal projection which is in a predication relation to that phrase, functioning as its “subject”.
47. Agreement: Agreement is a relation between an argument A and a head which governs A.

In this theory, the marked structural Cases⁶¹ are ergative, accusative and oblique. DPs with such Cases project KPs, that is, phrases headed by K (Case). K is the node filled by Case morphology at s-structure. The difference between marked structural Case and inherent Case is that the latter are underlyingly filled Ks, filled by the oblique markers, whereas the former are underlyingly empty Ks⁶². Being underlyingly empty, marked structural Ks are subject to the Empty Category Principle (ECP) and must be *Case-bound* by an appropriate antecedent according to (44), repeated below as (48):

48. Appropriate Case-binding antecedent: H is an appropriate antecedent for A iff all of the following conditions are met:
 (a) H either projects or governs a “small clause” containing A.
 (b) H locally c-commands A.
 (c) H governs a Case-Competitor of A.

⁶¹ The term “marked structural Case” means “non-default structural Cases. The default structural Case is nominative, both for ergative and accusative languages.

⁶² This explains why languages may not realize unmarked structural Cases overtly, whereas they never fail to realize inherent Case overtly.

The governing head has to be in a *local government* relationship with the KP: it must c-command the KP, and either project or govern a maximal projection containing that KP (cf. Williams (1980) for the notion of “distinguished adjunct”):

49. Small Clause: A phrase to which a distinguished adjunct is attached (this is the structural relationship of predication, where the adjunct is the subject of the phrase).
50. Distinguished adjunct: The adjunct of a maximal projection which is in a predication relation to that phrase, functioning as its subject .

The final condition that must hold is that the governing head has to also govern a Case-competitor⁶³ of the KP. Case competitors can be either nominal heads adjoined to the verb (Determiners or Nouns) or “bare” DPs, that is, DPs which do not extend into KPs. The theory accounts for why nominative is unmarked universally: the only structural Case that bare DPs may have is the default nominative, and this follows from their status as Case Competitors. The Case Binding theory dictates that the only heads responsible for Case are K and C:

51. Case: (a) Case Filter: A DP must be governed by a Case-like head (that is, C or K).

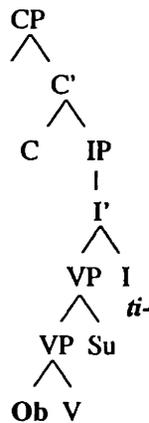
The reason for this apparent stipulation is the similarity in behavior (cross-linguistically) between Case and complementizer morphology: In languages such as Japanese, for instance, Case and complementizers can both be dropped when adjacent to the phrases they govern at s-structure, but not otherwise (when the phrase is scrambled, for instance).

Therefore, all nominative arguments are bare DPs which get the default nominative Case when they are governed by the one grammatical category other than K which functions as a Case-like head, that is C. In the Case-Binding theory, C is the functional

head responsible for licensing nominative Case in both ergative and accusative languages. Languages in which nominative Case is not licensed in-situ have A-movement to Spec,IP for Case reasons: to get into a government relation with C, the Case-like head. With respect to agreement, an argument normally agrees with the head which is its Case licenser. However, this Case relationship between a DP and its Case-governor does not always translate in an agreement relationship. We will see below that a prediction made by this theory is instantiated in Karitiana, where a DP, in certain syntactic configurations, may agree with a head which is not its Case licenser.

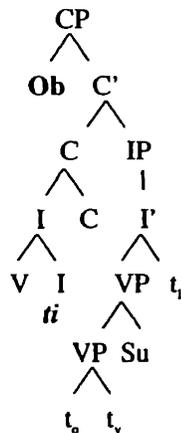
The trees in (52)-(53) represent the deep and surface structures of the object focus construction, which arises when an object is raised to focus position in the specifier of CP in a non-declarative root clause (cf.(31)-(34)).

52. Object focus construction (d-structure)



⁶³ Bittner and Hale were inspired here by Marantz (1994)'s notion of dependent Case. This idea was articulated much earlier, in an unpublished paper by Diane Massam and Juliette Levin (Ken Hale, pc).

53. Object focus construction (s-structure)



First let us determine which of the two arguments present in (53) are Case-bound (cf. (43)) by an appropriate head (cf. (44)). Starting with the object: the lower head V does not meet condition (44c). It does not govern (m-command, without the interference of a barrier) a Case-competitor for the object because it does not m-command the subject, since the lower VP includes V but crucially excludes the subject.

Now let us check whether I Case-binds the object: it does not locally c-command the object, but the subject. I also governs a Case-competitor for the subject, that is, the object. The subject, then is Case-licensed in its relationship with I. In the Case-binding theory, this is an indication that the subject is inside a KP, that is, a phrase projected by the head K, in this configuration ergative Case (universally). The Case-competitor, that is, the object, is by definition a bare DP, which does not occur inside a KP. To be licensed, therefore, this bare DP object must be c-commanded and governed by C, which

in this structure it is, since V-I-C movement eliminates all the barriers for government of C into the object position⁶⁴.

To explain eccentric agreement in the object focus construction, Hale and Storto (1997) analyze the prefix *ti-* as an inflectional head (of category I), which substitutes the agreement features that normally motivate agreement in I. In this way, the morphology introduced in inverse sentences frees the ergative argument from the agreeing relation that it has with I, enabling this argument to agree with the other functional head which has agreement features: C. Since in object focus constructions I is inactive for agreement purposes, and the subject is positioned above the trace of the object at s-structure (where agreement holds), the first argument which agrees with C has to be the subject, which is the closest argument governed by C.

There is strong cross-linguistic evidence for this analysis. As we will see below, the phenomenon of marking A-bar movement with inflectional morphology is not uncommon: there are constructions strikingly similar to the object focus construction in K'ichee'. In K'ichee' it is the subject that undergoes focus (A-bar) movement. Furthermore, it is exactly in these inverse focus constructions that eccentric agreement is found in K'ichee' as well.

⁶⁴ V to I to C movement is not limited to the focus inverse, but required in all matrix clauses.

Hale and Storto (1997) show that K'ichee' Maya has a phenomenon very similar to the Karitiana object focus construction. The morphology used to mark the antipassive (AP) in K'ichee is homophonous with the morphology used to mark the transitive agent focus (AF) construction:

<i>K'ichee' antipassive</i>				
54.	x-Ø-kuna-n	lee achi	ch-aaw-ee	'The man cured you'
	<i>Asp-3s-cure-AP</i>	<i>the man</i>	<i>TO-2s-RN</i>	
 <i>K'ichee' agent focus constructions</i>				
55.	Laa aree	lee achi	x-at-kuna-n	(at) 'Was it the man who cured you?'
	<i>Q FOC</i>	<i>the man</i>	<i>Asp-2s-cure-AF</i>	<i>(2s)</i>
56.	Laa at	x-at-kuna-n	lee achi	'Was it you who cured the man?'
	<i>Q 2s</i>	<i>ASP-2s-cure-AF</i>	<i>the man</i>	

(Hale & Storto 1997)

The environments in which the K'ichee agent focus construction occurs are exactly parallel to the ones triggering the Karitiana object focus construction: (i) relative clauses; (ii) wh-questions; (iii) focus constructions. The major differences between the two are: (i) in K'ichee' the argument that is focused is the transitive subject, and in Karitiana it is the object; (ii) agreement in the K'ichee' focus construction may be either with the ergative subject or with the nominative object, depending on a hierarchy (1,2 > 3), whereas in Karitiana, all matrix object focus clauses invariably show ergative subject agreement. Although subject and object are not equidistant from the single locus of agreement in the K'ichee' focus construction (which is C, as in Karitiana), the putative elimination of the agreement features of the functional head I effected by the insertion of the focus morphology enables C to agree with either one of the two arguments, depending on the hierarchy. Whenever an overt agreement marker (1, 2colloquial, 3pl) competes with a covert agreement marker (3s, 2formal), the overt morpheme is the one that will appear on

the verb. The agent focus construction is blocked when both the subject and object require overt agreement (that is, when they are ranked equally in the hierarchy), because there is only one available functional head available for agreement in the construction. (57) is an agent focus construction in which the object is first person and the subject is third person. In this case, agreement is with the object, because first person is ranked higher than third person:

K'ichee' agent focus construction

57. Aree	lee achi	x-in-kuna-n	(in)	<i>'It was the man who cured me'</i>
FOC	the man	ASP-1s-cure-AF	(1s)	

In (58) the grammatical roles are reversed with respect to (57): the subject is first person and the object is third person. Still, the first person agrees with the verb, as it does in (57), because of its undominated ranking in the hierarchy:

K'ichee' agent focus construction

58. In	x-in-kuna-n	lee achi	<i>'It was I who cured the man'</i>
1s	ASP-1s-cure-AF	the man	

Examples (59)-(60) are ungrammatical, because when two highly ranked agreement markers (first and second person) must be expressed, the sentence cannot be expressed in the agent focus construction, which has a single slot of agreement:

59. *In	x-in-kuna-n	at
1s	Asp-1s-cure-AF	2s
60. *In	x-at-kuna-n	at
1s	Asp-2s-cure-AF	2s

(Hale & Storto 1997)

Note that K'ichee' is a better example than Karitiana in support of the hypothesis that inverse focus constructions show eccentric agreement as a result of the neutralization of agreement features in I: although both active and agent focus sentences are transitive, the former have two loci of agreement, whereas the latter have just one. Hale and Storto (1997) suggest that the explanation for this pattern has to do with the insertion of focus morphology, since A-bar movement by itself is unlikely to be the reason for this type of change in agreement patterns. Let us now consider the structure of antipassives to differentiate them formally from inverse⁶⁵ constructions such as the agent focus construction.

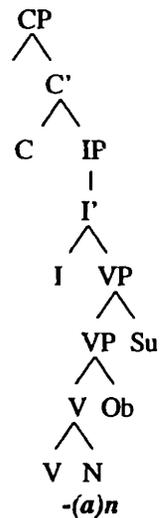
In antipassives, agreement is nominative because the verb is intransitive. Bittner and Hale point out that antipassives are common in ergative languages, and also occur but are rarer in three-way-languages⁶⁶. Nominative-accusative languages have not been observed to have antipassives. In the Case-Binding theory antipassives have a nominal head (the antipassive morpheme) incorporated on the verb at d-structure (Baker (1988), Bittner (1994)), which qualifies as a pseudo co-argument of the object. This structural relationship in the Case-Binding theory is responsible for the marked structural oblique Case⁶⁷. The verb Case-binds the object but the absence of any functional head adjoined to the verb makes it impossible for the object to get a direct Case (if D were adjoined to V, instead of N, the theory would predict that the verb would assign accusative Case to the object.

⁶⁵ I consider the focus constructions we are dealing with in Karitiana and K'ichee' to be inverse constructions. My definition of inverse voice is a transitive configuration which morphologically marks an inversion of the unmarked word order arising as a result of a specific type of A-bar movement (either subject or object). The morphology associated with inverse voices may be overt or covert.

⁶⁶ Three-way languages are languages in which the intransitive subject is nominative, the transitive subject is ergative, and the object is accusative. An example is Nez Perce.

The subject cannot itself project a KP, because only a bare DP can serve as a Case-competitor for an argument, and the object is not able to play that role: it is in a configuration in which it has marked structural Case (that is, projects a KP). Agreement in the antipassive is nominative for the same reasons. The failure of I to Case-bind the subject, also eliminates that head's ability to agree with that argument because it is no longer a governor with respect to the argument. Abstracting away from verb movement, the antipassive structure in K'ichee' is⁶⁸:

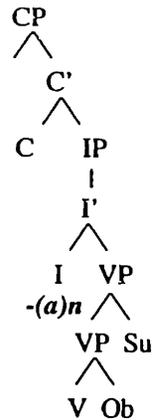
61. *K'ichee' Antipassive (d-structure)*



⁶⁷ Oblique Case is realized in distinct forms cross-linguistically. Each language has its own conventions on how to morphologically mark obliques.

⁶⁸ Based on work by Nora England (England 1989) and Judith Aissen (Aissen 1996), as well as Nik'te' and Saqijix (1993), Hale and Storto (1997) assume the basic word order of K'ichee' is VOS.

62. *K'ichee' Agent Focus Construction (AFC)*

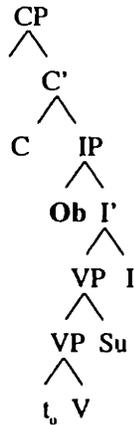


We will see in chapter 5 that Karitiana also has a pair of intransitive (passive) and transitive constructions marked by homophonous morphology. The parallels between these constructions and the non-declarative object focus construction indicate that Karitiana, at one point in its history, started making use of passive/antipassive morphology to create A-bar possibilities that were not available at an earlier stage in the language's development.

Having analyzed K'ichee' and Karitiana Case and agreement configurations in a similar fashion, I will now show that there are theory internal reasons to discard the hypothesis that Karitiana is an ergative language in which nominative arguments have to raise to get Case ("raising ergative language"). It is important to note that the case Binding theory can only account for the object focus construction facts if the sentential structure of Karitiana is able to Case-license the subject above the object. If Karitiana were a language in which the subject is Case-licensed below the object, as in "raising ergative" languages, where the object is forced to raise to Spec,IP to check Case features,

the theory would predict the incorrect result, that is, that object agreement would surface in the object focus constructions, since in that configuration the object would be the closest argument governed by C at s-structure, where agreement holds:

63. *Raising ergative clause structure (s-structure)*



Bittner (1994), and Bittner and Hale (1996) predict that in languages in which the verb raises to C (covertly or overtly), there is no motivation for the object to raise, since V-I-C movement renders the clause transparent, and in such a configuration the object can be governed by C without the intervention of barriers.

The reasons for assuming that this hypothesis is correct in Karitiana are: (i) there would be no alternative explanation for eccentric agreement in the OFC construction if the object checked Case in a position higher than the subject because the argument closest to C would be the trace of the object; (ii) it is independently known that there is verb raising to C in non-wh matrix clauses, which is the defining characteristic of “transparent ergative” languages; (iii) there is no evidence for syntactic ergativity in the language, because topic chaining and relativization have accusative pivots:

64. Taso na-sombak ḡonso, a-mbyyk naka-tat
Man decl-see (tr) woman and-then decl-go

'The man_i saw the woman and left_i.'

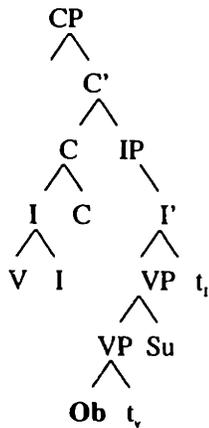
65. [Jonso-ty ōwā so'ooto]-p na-aka-t i-mbik
Woman-obl child see (intr)-? decl-cop-nfut 3-sit

The woman_i who the child saw sat_i

The s-structure I propose for active matrix clauses in Karitiana is represented in (66),

where both the subject and the object are licensed in situ:

66. *Transparent ergative clause structure (s-structure)*



Going back to the diachronic relationship between antipassives and focus constructions, we will see that Tupi languages show grammaticalization of some nominal heads as functional heads, because object focus morphology is homophonous with voice morphology in other Tupian languages as well. This section is a first attempt to discuss two of those languages with respect to voice alternations. I will start with Mekéns, which

is one of the four languages of the Tupari subfamily⁶⁹. Mekéns has both a transitive and an intransitive construction marked by the same verb prefix *i-*, which is very likely to be a cognate with *ti-*, the non-declarative object focus construction prefix in Karitiana. The Mekéns data I will discuss was provided by Ana Vilacy Galucio⁷⁰.

Galucio identified two special constructions in Mekéns, one transitive and one intransitive, both of which are marked by a verb prefix *i-*. Although she describes this prefix as a third person marker, it seems clear to me, in face of the similarities between the transitive construction in Mekéns and the non-declarative object focus construction in Karitiana, that it is in fact a voice marker. The function of the *i-* transitive construction in Mekéns is to focus an object. Some of the environments in which the Mekéns object focus construction occurs are: cleft sentences, object wh-questions, answers to such questions, and object relatives (Galúcio, 1996, 1997)⁷¹:

- | | |
|--|---|
| 67. arobēp tete e-i-mī
what foc 2s-OFC-kill | ‘What did you kill?’ |
| 68. isii ebōēp te o-i-mī te i-nō
deer really foc 1s-OFC-kill foc 3s-other | ‘It is really a deer that I killed, said the other’ |
| 69. ēt te o-i-so-p ikāō
you foc 1s-OFC-see-? that (time) | ‘It was you that I saw that time’ |

Note that (69) clearly shows that *i-* cannot be a third person agreement marker, since that does not reflect the meaning of the subject or object of the sentence. This evidence corroborates the OFC hypothesis.

⁶⁹ Mekéns has been wrongly classified as a Mondé language in the Ethnologue (1984), as well as in Rodrigues (1986).

⁷⁰ Vilacy Galucio is currently writing a morphosyntactic description of Mekéns, to be submitted as her Ph.D. dissertation at the University of Chicago.

The lack of agreement, and the plural morphology referring to the underlying object on the verb could be taken as evidence that the oblique argument is indeed incorporated. I suspect that the lack of agreement can also be related to the tense and aspectual morphology required in the construction, which is crucially absent from the transitive *i*-construction in (67)-(69). This issue must remain inconclusive until a more complete description of Mekéns is available.

I conclude that the Karitiana and the Mekéns object focus constructions and the antipassive *i*-construction in Mekéns have probably historically derived from the same source: an antipassive.

Karo⁷⁴, a Tupian language of the Ramarama family, has a construction (occurring with transitive and intransitive verbs) marked by a cognate of the *i*- prefix present in Mekéns. This prefixation occurs obligatorily in Karo in some environments (it is not clear which ones) when an object or an intransitive subject is extracted (Gabas Jr, 1994). So little is known about the meaning of this construction, however, that it is not even possible to determine whether the landing site of the extracted phrase is associated with focus or topic semantics. Although Gabas Jr. says that the function of *i*- is that of marking extraction of an emphatic subject in intransitive finite clauses, he doesn't specify how this emphasis is to be characterized. Furthermore, it is not clear whether we are dealing with one or two constructions. For those reasons, I will gloss the prefix *i*- as the

⁷⁴ This language is also known as Arara, which is the word for 'macaw' in Portuguese. It is not to be confused with the Karib language called Arara (spoken in the state of Pará), or with the isolated language Koaiá (spoken in the state of Rondônia), also known as Arara.

marker of an extraction construction (EC)⁷⁵ which fronts the extracted argument to a clause initial position:

- | | |
|--|------------------------------------|
| 77. naʔto iʔke ɔn i-top-∅
tapir neg I EC-see-asp | ‘It was not the tapir that I saw’ |
| 78. ɔn iʔke i-keɪ-∅
I neg EC-sleep-asp | ‘It wasn’t me who slept’ |
| 79. ɔn i-kap-∅ o-ker-a
I EC-aux-asp 1s-sleep-ger | ‘It is me who will sleep’ |
| 80. ɔn i-kap-∅ naʔto wī-a
I EC-aux-asp tapir kill-ger | ‘It is me who will kill the tapir’ |
| 81. toto i-betɔ-∅ o-kay
God EC-tell-asp 1s-involve | ‘It was God who told me’ |

In Karo, as in Mekéns, the presence of aspect in *i*-constructions correlates with a lack of agreement on the verb. In *i*-constructions with future tenses in Karo, an auxiliary is required, as in the Karitiana object focus constructions. In Karo, the infinitival main verb receives nominative agreement in such configurations, whereas the auxiliary, which gets the voice and aspectual morphology, shows no agreement whatsoever. This reminds us of the Mekéns intransitives just discussed. This picture is consistent with an analysis of the *i*-constructions in both languages as voice constructions.

⁷⁵ The verb suffix *-a*, glossed as ‘gerund’, is one of the non-finite verb forms. The verbs suffixed by aspect markers are finite (Gabas Jr. 1994).

CHAPTER 5 - OBJECT FOCUS CONSTRUCTIONS

0. Introduction

This chapter aims primarily to examine the non-declarative object focus construction in the two environments in which it surfaces without agreement: relative clauses and wh-questions. The lack of agreement in relative clauses is expected, since dependent clauses do not exhibit agreement in the language (cf. chapters 3 and 4). The interest of these object relatives is the presence of focus morphology on the verb, confirming the hypothesis raised in chapter 3 that the only functional head projecting in embedded clauses (Asp) is a tenseless version of I. The wh version of the object focus construction is tenseless because the verb is nominalized in these cases. We will see that wh-movement of the argument bearing nominative Case (object and intransitive subject wh-questions) are clefts which take a nominalized predicate. We will see that the discussion about nominative wh-questions is useful to us because it indicates that the functional head C is indeed associated with nominative Case.

A second goal of the chapter is to describe the other focus construction present in the language: the declarative object focus construction. This construction is marked by a morpheme which is homophonous with impersonal passive morphology. I hypothesize that the impersonal passive morphology is a pronoun with an unspecified [person] feature, which serves as an external argument to a VP which already has an internal argument (transitive, unaccusative). I argue that this pronoun, of category D, was grammaticalized historically as a Complementizer (C) in the declarative object focus construction (henceforth declarative object focus construction). This explains why there is no variable agreement morphology in this construction, where the focus marker takes

the slot of agreement morphology on the verb, adding the unspecified [person] feature to the derivation. We will see that some restrictions on the construction follow directly from the presence of the unspecified [person] feature in C: that first or second person objects cannot appear in the object focus construction. The theoretical interest of the declarative object focus construction is that it provides confirmation to the analysis of eccentric agreement presented in chapter 4.

1. The non-declarative object focus construction in relative clauses

We saw in chapter 4 that Karitiana has a construction involving A-bar movement of the object to Spec,CP in both matrix and subordinate *non-declarative* clauses, which I called the object focus construction. Whenever there is A-bar movement of an object to the specifier of the highest maximal projection in a clause, the insertion of OFC morphology is obligatory.

1. *Object Focus Construction: (non-declarative)*

If the object of a transitive clause is focused, then OFC-formation (the insertion of *tí-*) is obligatory.

This construction is marked by the verbal prefix *tí-* and occurs in three syntactic environments: (i) when an object is focused, (ii) in relative clauses headed by an object and (iii) in object wh-movement. Type (i) object focus constructions were discussed in chapter 4. Types (ii) and (iii) will be discussed in sections 1.1. and 1.2., respectively.

1.1. Object relativization

Type (ii) object focus constructions involve no agreement, as shown in (0)-(4), because agreement is limited to matrix clauses in the language:

Embedded object focus construction without agreement

2. Y-py-so'oot-on yn [eremby yjxa ti-sokō'ĩ]-t 'I saw the hammock that we tied up'
1s-assert-see-nfut 1s hammock 1p OFC-tie.up-obl

3. Y-py-so'oot-on yn [eremby João ti-sokō'ĩ]-t 'I saw the hammock that João tied up'
1s-assert-see-nfut 1s hammock João OFC-tie.up-obl

Embedded object focus construction with agreement

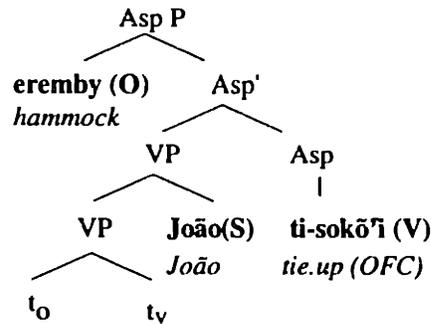
4. * Y-py-so'oot-on yn [eremby João i-ti-sokō'ĩ]-t 'I saw the hammock that João tied up'
1s-assert-see-nfut 1s hammock João 3-OFC-tie.up-obl

In chapter 3 I offered evidence that at most one functional head is present in subordinate environments, and that this head is not C, but an aspectual head (Asp). I argued that subordinate verbs move to a (overt or covert) functional head at the right edge of the sentence, but never to C, the head-initial position where overt agreement is available in matrix clauses. The object relative focus constructions in (0)-(3), as expected, are verb-final and have no agreement. They provide further evidence for the hypothesis that focus morphology occupies the nucleus of the head-final functional projection Asp (the tenseless version of I), and not C.

Recall from chapter 3 that there are two types of relatives in Karitiana: head internal and head external. Although they differ with respect to the overt versus covert nature of the relativized argument, in both cases they are marked by the object focus morphology *ti-* when that argument is an object. Head internal relative clauses such as (0)

and (3) are formed by overt movement of the head of the relative – in this case, *eremby* – to the specifier of the highest projection inside the relative clause (Spec, AspP):

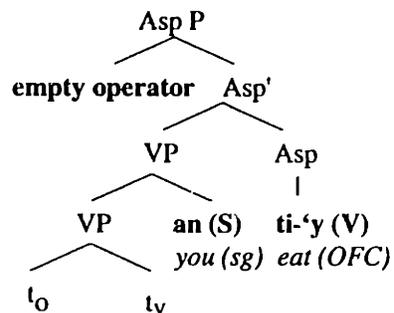
5. *Head Internal Relative Clause*



For the sake of completeness, let us examine what happens in head external relative clauses. In (0)-(3), we saw that objects can be overtly extracted to a specifier position inside the Head Internal Relative Clause which I called Spec,AspP. Similarly, in head external relative clauses an operator coindexed with the external head of the clause can be extracted to that same position:

6. Y-pyr-ohit-in yn 'ip-ity [OP an ti-'y]-t 'I caught the fish for you to eat'
Is-assert-fish-njut *Is fish-obl* *OP 2s* *OFC.-eat-obl*

7. *Head External Relative Clause*



In both head internal and head external object relatives, object focus morphology emerges on the verb, according to (1). These instantiations of the object focus construction behave as predicted: they are verb-final, and lack agreement morphology. We turn now to object wh-clauses, which are specially interest in that they pattern like intransitive subject wh-clauses and unlike other types of wh-clauses.

1.2. Object wh-movement

Let us now look at instantiations of type (iii) object focus constructions, triggered by object wh-movement. One of the peculiarities of this type of wh-movement, is that it forces a cleft configuration to arise⁷⁶. Note that the answer to a nominative wh-question⁷⁷ may be clefted⁷⁸:

8. Q: Mora-mon an ti-hit-Ø tāj-ty?
 Wh-cop 2s *OFC.part-give-nfut* *knife-obl*

'To whom is it that you gave the knife?'

9. A: João na-aka-t yn ti-hit-Ø tāj-ty
 João *decl-cop-nfut* *Is* *OFC.part-give-nfut* *knife-obl*

'It is to João that I gave the knife'

As we will see, evidence for clefting is the presence of a copula verb, the nominalization of the lower verb (in the cases above, with the participle morpheme *i-*, which fuses with

⁷⁶ In fact, this peculiarity is not limited to object wh-movement. We will see that intransitive subjects also trigger clefting when they undergo wh-extraction.

⁷⁷ Ditransitive verbs such as “give” have an agent as the subject, an oblique theme and the goal as an object.

the *ti-* prefix)⁷⁹, and the marking of the predicate of the cleft with non-future tense. It would perhaps be possible to analyze these constructions as monoclausal instantiations of I to C movement (similar to “do support”). The problem with that alternative analysis, in my view, is not being able to explain the obligatory nominalization of the verb. Another reason for rejecting the I to C analysis is that, if these constructions were not clefts but focus constructions, then the language would have two different monoclausal focus constructions, which seems redundant. The one point the I to C analysis may have in its favor is the fact that *mon* has the same tense features (in this case, nonfuture tense) as the rest of the question, unlike clefts in English. However, there is no reason why clefts in Karitiana should be similar to clefts in English. We will see that the Karitiana cleft is different from the English cleft in more than one way: it has tense marked in the copula, and that tense is also realized in the nominalized predicate. Also, we know that the nominalized predicate is not an embedded clause, but a nominalized IP, because it is not obligatorily verb-final).

Next, I will describe object wh-clauses and argue for an analysis in which they are clefts. I will show that: (i) wh extraction of an intransitive must also be obligatory cleft, suggesting that the cleft construction is the optimal configuration to check the features of a nominative wh-phrase in C; (ii) there seems to be some grounds to believe that there is a relationship between tense and nominative Case, which could perhaps be explained by the default nature of nominative Case, and the fact that C is a head that checks both tense and nominative Case in languages such as Karitiana.

⁷⁸ The only other way to answer an object wh-question is in the declarative object focus construction, to be discussed in section 2.

⁷⁹ Nominalization of the predicate can also be effected through the use of the instrumental nominalizer *-pa*, as we will see in (25).

The syntactic configuration of object wh-clauses is therefore very different from the matrix non-wh object focus constructions discussed in chapter 4. When an extracted wh-object is clefted, the lower verb is marked by the OFC morphology *ti-* and nominalized, which explains the lack of agreement. The matrix verb in an object wh-cleft is a copula whose subject is the extracted object and whose predicate is the wh-clause. The default copula *aka* is used in the future (irrealis), and *mon* in the nonfuture:

- | | |
|--|-------------------------------------|
| 10. Mora-mon an ti-opī-t?
<i>wh-cop 2s OFC. part-cut-nfut</i> | ‘What is it that you cut?’ |
| 11. Morā i-aka-j an ti-pisok
<i>wh 3-cop-irr 2s OFC. part-stab</i> | ‘Who is it that you will stab?’ |
| 12. Morā i-aka-j taso ti-pisok
<i>Wh 3-cop-irr man OFC. part-stab</i> | ‘Who is it that the man will stab?’ |

One immediately visible distinction between future and non-future object wh-clefts is the behavior of the copulas in each case. In the future the copula behaves as a verb: it is preceded by agreement morphology and followed by the irrealis suffix. In the nonfuture, however, the copula is an enclitic to the wh-phrase, and does not show overt agreement or tense morphology. Nonfuture tense is marked on the predicate of the copula instead. *Mon* does not have overt person agreement⁸⁰, but given that its presence is obligatory exactly in nonfuture nominative wh-clauses, it must have at least the following features: nonfuture tense and nominative Case. I consider this copula verb to be a suppletive form carrying Case and tense features. The feature [+wh] is not part of the semantic specification of *mon* because the copula is used in other types of interrogatives as well (polar interrogatives):

13. Yjxa-mon haka?
people.-cop here

'Is anybody here?'

14. I-ybykyj? Mora-mon hỹ? Taaty-mon hỹ?
3-arrive(pl) wh-cop interrog. Taaty-cop interr.

'Did they arrive? Who was it? Was it Taat'y?'

15. Hyp i-syp y-timōj? Morā 'ep aka-mon hỹ?
there 3-put 1s-grandmother wh stick dem-cop interr.

'What is put there, grandmother? Which stick is it?'

Interestingly enough, the cleft construction is not limited to object wh-questions in Karitiana. It also occurs when intransitive subjects are wh-moved. The generalization is that, when a nominative argument undergoes wh-extraction, clefting is obligatory. The important point here is that the obligatory clefting of a nominative wh-sentence is independent of the object focus construction (OFC). Intransitive wh-questions crucially do not trigger the OFC:

⁸⁰ The non-declarative third person agreement *i-* fails to prefix *mon* in all of its uses, although I have claimed otherwise. Storto (1998) mistook the diminutive clitic *i* for a third person prefix in a series of examples.

Intransitive subject wh-movement⁸¹:

16.	Mora-mon	i-hyryp	ty-ka-t?	'Who is it that is crying?'
	Wh-cop	part-cry	imperfv-motion-nfut	
17.	Mora-mon	i-hyryp	ty-ka?	'Who is it that is crying?'
	Wh-cop	part-cry	imperfv-motion	
18.	Mora-mon	i-pyt-'y-t?		'Who is it that ate (intr.)?'
	Wh-cop	part-eat(intr.)-nfut		
19.	Mora-mon	i-oty-t?		'Who is it that bathed?'
	Wh-cop	part-bathe-nfut		
20.	Morā	i-aka-j	i-pon?	'Who is it that will fire?'
	Wh	3-cop-fut.	part-fire/shoot	
21.	Morā	i-aka-j	i-oty?	'Who is it that will bathe?'
	Wh	3-cop-irr.	part-bathe	

Note that the nonfuture tense suffix ($-t/-\emptyset$) occurs in the predicate of all nonfuture copula sentences⁸²(cf. (16) and (18)-(19)), but not in future clefts (cf. (20)-(21)). Below, we have nonfuture clefts whose predicates are nouns. They also receive a nonfuture tense suffix:

22.	Byty	na-aka-t	[kinda 'o]-t	'Papaya is a fruit'
	Papaya	decl-cop-t-fut	[thing fruit]-nfut.	
23.	Kinda 'o	na-aka-t	[asyryty]-t	'Banana is a fruit'
	Thing fruit	decl-cop-nfut	banana-nfut.	
24.	'Ep	na-aka-t	[jepŷry]-t	'A club is a piece of wood'
	wood	decl-cop-nfut	club-nfut.	

⁸¹ The nonfuture suffix can be optionally dropped when imperfective auxiliaries are present (cf. 17), but not elsewhere:

- | | | | |
|----|-----------|-----------------|-------------------------------|
| a. | *Mora-mon | i-pyt-'y? | 'Who is it that ate (intr.)?' |
| | Wh-cop | part-eat(intr.) | |
| b. | *Mora-mon | i-oty? | 'Who is it that bathed?' |
| | Wh-cop | part-bathe | |

⁸² I thank Ken Hale for pointing this out to me.

Another trait of clefts is that the verbal head of the predicate has to be nominalized in some way, by the addition of either one of the following derivational affixes: the participial *i-* or the instrumental nominalizer *-pa*:

25. Tēpa na-aka-t [byrytik sokōʔi-pa]-t
 Vine decl.-opula-nfut torch to.tie.up-nfut.

'Vines are the binders of torches'

26. Byrytik na-aka-t [bywot i-a-m-'a]-t
 Torch decl-cop-nfut light participle-pass-caus-do-nfut.

'A torch is a hand-made flashlight'

I assume that in the object *wh*-sentences (such as 10) the participial prefix *i-* occurs between the prefix *tī-* and the root.

A comparison between nominative versus ergative and oblique *wh*-extraction shows that the former is the only type of *wh*-fronting which requires the cleft construction:

Ergative *wh*-movement:

27. *Morā i-pa ty-ja-t? 'Who is weaving (it)?
 wh 3-weave imperfve-sitting-nfu
28. Morā i-pa ty-ja? 'Who is weaving (it)?
 wh 3-weave imperfve-sitting
29. *Morā i-oky ty-ja -t y-opok ako? Who is killing my chickens?
 wh 3-kill imperfve-sitting-nfut Is-chicken(s)
30. Morā i-oky ty-ja y-opok ako? Who is killing my chickens?
 wh 3-kill imperfve-sitting Is-chicken(s)
31. Morā i-kyno-j karamatomo? 'Who will close the door?'
 wh 3-close-irr door

Oblique wh-movement:

38. Morā-kyn i-pon i-aka-j? 'Who is it that he will shoot at?'
Wh-at part-go 3-cop-irr

The last thing that has to be said about wh-interrogatives is that these clauses are tenseless. Two types of evidence can be given in favor of this hypothesis: (i) the absence of nonfuture tense in non-nominative wh-clauses (cf. (28)-(30), and (33)); (ii) the use of the nominal (instead of sentential) negation marker *-ki* in all wh-clauses⁸³:

39. Morā-song a-tata-ki escola-pip? 'Why don't you go to school?'
Wh-for 2s-go-neg school-to

Furthermore, if we consider that the *-i/-j* verb suffix of future (irrealis) sentences is not tense proper, but an irrealis mood marker, it is clear that there is no tense marking in wh-clauses. Indeed, we mentioned before in chapter 5 that in one of its uses *-j* appears in the past tense.

The next issue to be addressed is then the following: What forces nominative wh-sentences to obligatorily cleft? We saw that the motivation for obligatory clefting must be independent of the object focus construction, because intransitive subjects cleft although

⁸³ The suffix *-ki* is used in tenseless clauses, such as embedded clauses, and interrogatives, where they suffix the verb, and in DPs, where they suffix the determiner:

Embedded verb with -ki

- (1) [kinda a-m-'a-ki pitat] ajxa ti-m-'a-t õẽ
thing DOFC-caus-do-neg really 2p OFC-caus-do-nfut dear
'You did something that you really shouldn't have done, my dear'

Yes-no question with -ki

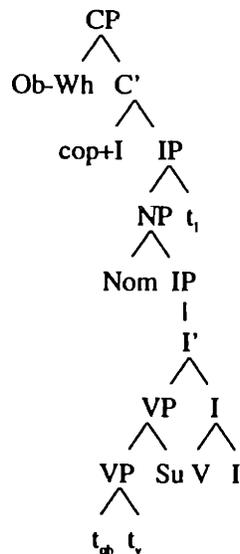
- (2) I-oky-ki pitat aj-'a hỹ?
3-kill-neg really 2p-do interr.
'(You) Didn't really kill it?'

Demonstrative with -ki

- (3) [a-ki tykiri] naka-'a-t bypiit-ap tyym
this-neg perfve decl-do-nfut far-in then
'If (we don't do) this, there will be death (lit: remoteness) then'

focus formation does not apply to them. In face of this, it is obvious that the solution to this puzzle must involve nominative Case, tense, and the [+wh] feature in C. The explanation for why nominative wh-fronting triggers clefting could be the fact that nominative Case in Spec,CP can only be licensed if C is tensed (+ or – nonfuture). Since wh-clauses do not have tense, a cleft construction is forced. Clefts have the perfect structure for checking the features of nominative wh-clauses because their subjects are focused, the copula verb in C is able to bear the tense feature, and their predicates are nominalized:

40.

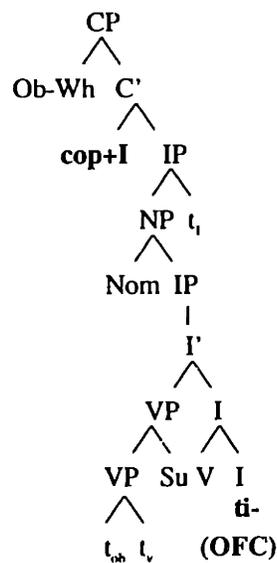


The requirement that nominative Case can only be licensed in a [+wh] Spec,CP if C is tensed makes sense if we assume that nominative Case in some environments *is the realization of tense in C*. I will not try to fully explain why languages sometimes realize nominative Case in the locus of a tense feature. I assume that this must follow from the fact that C, universally, is the only Case licenser of nominative Case, and that T to C movement (overtly or covertly) is required in order to remove TP as a barrier for

intransitive subjects versus transitive subjects, whereas Pittapita marks all subjects distinct from objects. In both languages, the crucial factors in the equation seem to be nominative Case checking, some type of tense that varies according to the language, and movement of T to C.

I conclude that nominative Case in Karitiana is either licensed in a (tensed or tenseless) clause in which V raises to I and C (as in active sentences, type (i) OFCs, or non-nominative wh-fronting), or in a Spec-head configuration in a cleft construction (cf. (43)), in which the higher I (T) is in C and the nominative phrase is in Spec,CP (as in nominative wh-interrogatives).

43.



2. The declarative object focus construction

In this section we will examine the declarative object focus construction, whose formative morphology is homophonous with the impersonal passive construction. First I will describe the impersonal passive and then proceed to compare the passive and the declarative focus construction. The section concludes with an analysis of the declarative focus construction as a focus construction whose morphology substitutes agreement in C.

The verb prefix *a-* is the marker of an impersonal passive in assertative clauses. Assertative morphology is prefixal (*pyt-*, which lenites to *pyr-* before a vowel), as other mood markers are, and occurs obligatorily in positive answers to yes-no questions. I assume that assertative clauses are the opposite of negated clauses, in that they are both projections of a polarity head (Pol), which takes VP as a complement (cf. (50)).

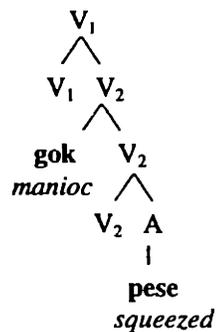
Structurally, the deep object is the subject of the passive and the meaning contributed by the construction is the identification of the agent as impersonal:

- | | | |
|--------------------------------|-------|------------------------------------|
| 44. Ø-Pyr-a-oty-dn | ōwā | 'They bathed the child (passive)' |
| 3-assert-pass-bathe(intr)-nfut | child | |
| 45. Ø-Pyr-oty-dn | i | 'He/she/they bathed (active)' |
| 3-assert-bathe(intr)-nfut | 3 | |
| 46. Y-pyr-a-oky-dn | yn | 'They killed me (passive)' |
| 1-assert-pass-kill(tr)-nfut | 1s | |
| 47. Y-pyr-oky-dn | i | 'He/she/they killed me (active)' |
| 1-assert-kill(tr)-nfut | 3 | |

many verbs with unaccusative behavior in languages have the argument structure of adjectives.

Since the Karitiana intransitive verbs which are allowed to undergo passivization in Karitiana seem to be adjectival, it makes sense to hypothesize that they are unaccusatives. I assume, with Hale & Keyser (1993, 1998) that the transitivized unaccusatives in impersonal passives have the following structure⁸⁶:

50.

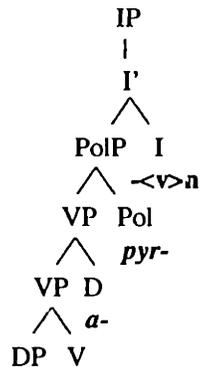


To account for the data examined so far, I hypothesize that the *a-* morpheme is a pronoun (and as such, of category D) which is adjoined as an impersonal agent to a VP which has an internal argument (transitives and unaccusatives). The internal DP will become the subject of the clause in the impersonal passive. The impersonal passive morphology, a pronoun, has an unspecified [person] feature, which is responsible for the impersonal (default) meaning of the construction⁸⁷:

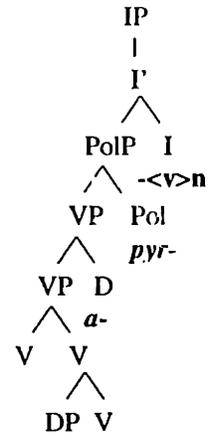
⁸⁶ The verb *pesek* is formed by the conflation of A with V_2 .

⁸⁷ The verb-initial word order in assertative and negated clauses (projected by PolP) can be accounted for if Pol is required to raise to C. Note that assertative clauses have a special suffix for nonfuture tense ($-\langle v \rangle n$). I believe assertative and negated clauses are verb-initial because they have a different tense marker than the declarative/non-declarative clauses in which Spec, CP is "required" to be filled. Storto (1998) suggested that the declarative morpheme is cognate with a second position focus marker in Mekéns. The reconstructed phonemes of the morphemes in question can be found in Storto and Baldi (1994) and Rodrigues (1995).

51. Transitive impersonal passive



Intransitive impersonal passive



Now that we understand the impersonal passive construction, we will proceed to discuss the homophonous object focus construction (the impersonal object construction), which is limited to declarative clauses. This focus construction is formed by the addition of the *a-* prefix, which has the same impersonal feature as the homophonous passive morpheme⁸⁸, but triggers a construction which is syntactically different from impersonal passives. I call this declarative focus construction the declarative object focus construction (DOFC) to make explicit the parallel between it and the non-declarative object focus constructions (OFC). I will argue that *a-* prefixation marks A-bar movement of an object to a focus position in declarative clauses. Before I discuss the semantics associated with this syntactic configuration, I will examine its syntactic characteristics. The following is a list of properties of the declarative object focus constructions. I compare some of the properties to the impersonal passive when this seems relevant to differentiate their status:

First, no intransitive roots ever occur in impersonal object focus clauses unless they are first causativized:

Fourth, the focus constructions in question may have an overt agent which obliterates the impersonal meaning altogether (cf (52)):

58. Oho a-taka-m-'a-t Cra 'Potatoes, Ora created'
Potatoes DOFC-decl-caus-do-nfut Ora

Fifth, the declarative object focus construction also occurs when the oblique object of a verb is focused:

59. Ambi-ty a-ta-so'oot-Ø 'The house, they saw'
House-obl DOFC-decl-see-nfut

Finally, the object of a declarative focus construction must be a third person:

60. *Yn a-ta-oky-t 'Me, they killed'
1s DOFC-decl-kill-nfut
61. *An a-ta-oky-t 'You, they killed'
2s DOFC-decl-kill-nfut

Confirmation of the transitive status of declarative object focus construction comes from two sources: (i) ditransitive verbs and (ii) anaphoric binding. Given that in active declarative clauses (cf. (64)-(65)) the nominative argument of a ditransitive verb is the goal, the oblique argument is the theme, and the ergative argument is the agent, the declarative focus constructions in (62)-(63) behave as transitive clauses: intransitivization does not take place, because ditransitive verbs do not undergo any change other than the substitution of agent agreement for a pronoun which can be interpreted as impersonal:

62. (Gokoty) taso a-taka-hit-Ø 'To the man, they gave (manioc)' (DOFC)
manioc-obl man DOFC-decl-give-nfut

63. Taso atakahit (gokoty) ‘To the man, they gave (manioc)’ (DOFC)
64. Yn naka-hit-Ø goko-ty taso ‘I gave manioc to the man’ (active)
1s decl-give-nfut manioc-obl man
65. Yn a-taka-hit-Ø an goko-ty ‘I. gave manioc to you’ (active)
1s 2s-decl-give-nfut 2s manioc-obl

Finally, it is clear that a thematic agent is present in the declarative object focus constructions, because subject-oriented anaphors in object position are possible:

66. Ta’it a-ta-oky-t taso ‘The man, killed his, son’
anaph-son DOFC-decl-kill-nfut man

The facts just described can be explained if we posit two different syntactic structures for the assertative and declarative *a*- constructions. We know, however, that the morphemes used to mark those two constructions are homophonous. A reasonable approach to this problem would be to claim that the morphemes have different categorial features in each voice. Homophony in this case is probably a result of grammaticalization. We saw that grammaticalization of an antipassive morpheme of category N into an focus morpheme of category I took place in K’ichee’. I believe a similar process occurred in Tupian languages. The evidence points to the hypothesis that the Karitiana impersonal passive morpheme found in non-declarative clauses has grammaticalized into a morpheme of category C in the impersonal focus constructions, the focus construction found in declarative clauses.

One of the problems we have to solve is why the usual agreement with the nominative argument is absent from the declarative *a*- constructions, but crucially present in the assertative ones. Whatever the reason, it has to be related to the fact that in the

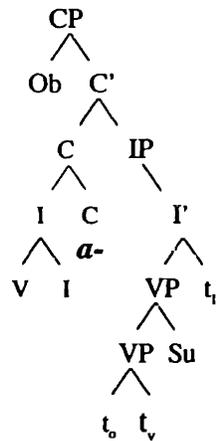
former the *a-* prefix precedes the mood morphology. Since Karitiana has two functional heads associated to agreement (I and C), one straightforward way of explaining the lack of agreement would be to suggest that *a-* substitutes into one of those heads, thus blocking agreement. We saw in chapter 4 that Karitiana already has a construction in which I is substituted by focus morphology: the object focus construction. We saw that Case-binding theory predicts that if the agreement features of I are blocked in a transitive clause, as it is in the object focus construction, the argument that would normally covertly agree with that head is free to overtly agree with C. This explains why the object focus construction exhibits eccentric ergative agreement. If the agreement features of I were neutralized in the declarative object focus construction as well, the theory would predict that there would be eccentric ergative agreement, since C is the only functional head in which overt agreement morphology is realized, and in this configuration the closest argument is the ergative subject. However, this makes the wrong prediction: we have seen that agreement is absent or null in the declarative object focus construction.

It seems correct to hypothesize instead, that *a-* is a head located in C, which brings an unspecified [person] feature to the construction. This explains two independent facts:

- (i) the reason why first and second person objects are disallowed in the declarative object focus construction (object agreement is a fixed impersonal, which is compatible with third person arguments but not first and second);

- (ii) the fact that nominative agreement morphology in declarative object focus constructions seems to be absent (third person declarative agreement is null). I conclude that the categorial feature of *a-* in declarative clauses is C:

67.



This account explains not only why *a-* occurs in the same slot as agreement - before the declarative morphology - but also why OVS sentences are obligatorily marked as focus constructions: the movement of an object to the specifier of CP is associated with focus semantics because C has a focus feature. This is clear from the data discussed in chapter 3, section 2, where it is shown that answers to object wh-questions are often formed in the declarative *a-* construction.

REFERENCES

- AISSEN, J. (1996) Pied-piping, abstract agreement, and functional projections in Tzotzil. *Natural Language & Linguistic Theory*. 14: 447-491.
- ARONOFF, M. and S. N. SRIDHAR (1983). Morphological Levels in English and Kannada, or Atarizing Reagan. In *Papers from the Parasession on the Interplay of Phonology, Morphology, and Syntax*. Chicago Linguistic Society, University of Chicago.
- BITTNER, M. (1994) *Case, Scope, and Binding*. Dordrecht: Kluwer Academic Publishers.
- BITTNER, M. and K. HALE. (1996a) The Structural Determination of Case and Agreement. *Linguistic Inquiry* 27:1-68.
- BITTNER, M. and K. HALE. (1996b) Ergativity: toward a theory of a heterogeneous class. *Linguistic Inquiry* 27 (4): 531-604.
- CHOMSKY, N. (1995). *The Minimalist Program*. MIT Press. Cambridge.
- CINQUE, G. (1993). A Null Theory of Phrase and Compound Stress. *Linguistic Inquiry* 24, 239-298.
- DAVIES, W. D. and L. E. SAM-COLOP (1990) K'iche' and the structure of antipassive. *Language* 66:522-549.
- DEN BESTEN, H. (1977). On the Interaction of Root Transformations and Lexical Deletive Rules. Ms. University of Amsterdam. Published 1981 in *Groninger Arbeiten zur Germanistischen Linguistik* 20, 1-74; republished 1983 in Werner, A. (ed.), *On the Formal Syntax of Westgermania*. John Benjamins, Amsterdam. Pp 47-131; republished 1989 in Hans den Besten, *Studies in West Germanic Syntax*. Rodopi, Amsterdam. pp.44-100.
- DIXON, R. (1994). *Ergativity*. Cambridge Studies in Linguistics 69. Cambridge University Press, Cambridge.
- DIXON, R. (ed.) (1987). *Studies in Ergativity*. Elsevier, Amsterdam.
- ENGLAND, N. (1989) Changes in basic word order in Mayan languages. Ms. La Antigua Guatemala: Centro de Investigaciones Regionales de Mesoamerica.

- EVERETT, D. (1986) A Note on Ergativity, S' and S'' in Karitiana. *Notes on Linguistics* 33. SIL.
- EVERETT, D. (1993). Case Spreading and Phrase Structure in Karitiana. Ms.
- GABAS JR., N. (1994). O Sistema Pronominal de Marcação de Pessoa na Língua Karo (Arara de Rondônia). In *Revista Latinoamericana de Estudios Etnolingüísticos* 8: 135-150.
- GALUCIO, V. (1996). Mekens Syntax – A Preliminary Survey. Ms. University of Chicago, Chicago.
- GALUCIO, V. (1997). Mekens (Tupi) Morphosyntax. Ms. University of Chicago.
- GREEN, T. (1992). Covert Clause Structure in the Miskitu Noun Phrase. General's paper.
- GRIMES, B (ed.). (1989) *Ethnologue: Languages of the World*. Dallas: SIL.
- GUSSMAN, E. (1992). Resyllabification and Delinking: The case of Polish voicing. *Linguistic Inquiry* 23.
- HALE, K. (1998). A Note on the Pittapita Nominative Case and Future Tense. Ms. MIT.
- HALE, K. and J. KEYSER (1993). On Argument Structure and the Lexical Expression of Syntactic Relations. In K. Hale and J. Keyser (eds.), *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*. MIT Press, Cambridge.
- HALE, K. and J. KEYSER (1998). On the Syntactic Projection of Predicate Argument Structure. Ms. Department of Linguistics, MIT, Cambridge.
- HALE, K. and L. STORTO (1997) Agreement and Spurious Antipassives. *Boletim da Associação Brasileira de Linguística (ABRALIN) 20 - Homenagem a Aryon Dall'igna Rodrigues*.
- HALLE, M. and W. IDSARDI (1995) General Properties of Stress and Metrical Structure. *Handbook of Phonological Theory* . (J. Goldsmith, ed.). Blackwell.
- HALLE, M. and K. P. MOHANAN (1985). Segmental Phonology of Modern English. *Linguistic Inquiry* 16, 57-116.
- HALLE, M. and J-R. VERGNAUD. (1987). *An Essay on Stress*. MIT Press, Cambridge.
- HAM, P. (1967). Morfofonemica Apinaye. In *Atas do Simposio sobre a Biota Amazonica*. Rio de Janeiro: Conselho Nacional de Pesquisas.

- ITO, J. (1989). A Prosodic Theory of Epenthesis. *Natural Language and Linguistic Theory* 7.
- KIPARSKY, P. (1982). Lexical Morphology and Phonology. In *Linguistics in the Morning Calm*. Hanshin, Seoul.
- KIPARSKY, P. (1983). Word Formation and the Lexicon. In F.A. Ingelman (ed.), *Proceedings of the 1982 Mid-America Linguistics Conference*. University of Arkansas, Lawrence.
- KIPARSKY, P. (1984). On the Lexical Phonology of Icelandic. In C. C. Elert, I. Johansson, and E. Straugert (eds.), *Nordic Prosody III: Papers from a Symposium*. University of Umea, Umea.
- KIPARSKY, P. (1985). Some Consequences of Lexical Phonology. In C. Ewen and J. Anderson (eds.), *Phonology Yearbook 2*. Cambridge University Press, Cambridge.
- KOOPMAN, H. (1983). *The Syntax of Verbs*. Studies in Generative Grammar. Dordrecht: Foris.
- LADEFOGED, P. and I. MADDIESON. (1996). *The Sounds of the World's Languages*. Cambridge: Blackwell.
- LANDIN, D. (1983). *Dicionário e Léxico Karitiana/Português*. SIL, Brasilia.
- LANDIN, D. (1984). An Outline of the Syntactic Structure of Karitiana Sentences. In *Estudos Sobre Línguas Tupi do Brasil*. Série Linguística 11. SIL.
- LANDIN, D. (1988). As Orações Karitiana. *Série Linguística* 9 (2). SIL, Brasilia.
- LANDIN, D. and R. LANDIN, (1973). A Preliminary Description of the Karitiana Phonological Structure. *Arquivo Linguístico No. 163*. SIL, Brasilia.
- LANDIN, R. (1982). Word Order Variation in Karitiana. *Arquivo Linguístico no. 149*. SIL, Brasilia.
- LANDIN, R. (1987). Conjunções Karitiana de Nível Superior. *Série Linguística* 9(1). SIL, Brasilia.
- LANDIN, R. (1989). *Kinship and Naming Among the Karitiana of Northwestern Brazil*. Masters Thesis. U. Texas, Arlington.
- LARSEN, T. W. (1987) The syntactic status of ergativity in Quiché. *Lingua* 71:33-59.

- MARANTZ, A. (1984). *On the Nature of Grammatical Relations*. Linguistic Inquiry Monograph 10. MIT Press, Cambridge.
- MEILLET, A. (1912) *Linguistique Historique et Linguistique Générale*. Paris: Champion.
- MITHUN, M. (1992). Is Basic Word Order Universal? In D. Payne (ed.), *Pragmatics of Word Order Flexibility*. Typological Studies in Language 22. John Benjamins, Amsterdam.
- MOHANAN, K. P. (1982). *Lexical Phonology*. Doctoral Dissertation, Department of Linguistics, MIT, Cambridge. Published by Indiana University Linguistics Club, Indiana.
- MONDLOCH, J.L. (1981) *Voice in Quiché-Maya*. Albany, N.Y.: SUNY-Albany Doctoral Dissertation.
- MOORE, D. 1991. A Few Aspects of Comparative Tupi Syntax. *47th International Congress of Americanists*. Ms.
- NIK'TE' and SAQIJIX (1993) *Gramática Pedagógica K'ichee'*. Guatemala: Oxlajuuj Keej Maya' Ajtz'iib'. Programa para el Desarrollo Integral de la Población Maya, Universidad Rafael Landívar
- PAYNE, D. (1994). The Tupí-Guaraní Inverse. In B. Fox and P. Hopper (eds.), *Voice: Form and Function*. Benjamins, Amsterdam.
- PESETSKY, D. (1979). Russian and Lexical Theory. Ms. Department of Linguistics, MIT, Cambridge.
- PYE, C. (1988) The Focus Antipassive in K'iche' Maya. University of Kansas Manuscript.
- RODRIGUES, A. (1986). *Linguas Brasileiras Brasileiras - para o conhecimento das linguas indigenas*. Loyola., São Paulo.
- RODRIGUES, A. (1995). Glottalized Stops in Proto-Tupi. Paper presented at the 1995 SSILA Conference. Ms.
- SELKIRK, E. (1995). The Prosodic Structure of Functional Words. In *Papers in Optimality Theory* (Beckman, J., L.Dickey & S. Urbanczyk, eds.). University of Massachusetts, Amherst.
- SPROAT, R. (1985). *On Deriving the Lexicon*. Doctoral dissertation, Department of Linguistics, MIT, Cambridge.

- STERIADE, D. (1993). Closure, Release and Nasal Contours. *Phonetics and Phonology* 5.
- STORTO, L. (1993). Closure and Release - Pre and Post Oralization of Nasal Stops in Karitiana. Ms. Pennsylvania State University.
- STORTO, L. (1994). Basic Word Order in Karitiana, *Report 8: Survey of California and Other Indian Languages*: 138-144. Department of Linguistics. University of California at Berkeley.
- STORTO, L. (1995). Relatório de Pesquisa Dirigido à FUNAI - Descrição e Análise da Língua Karitiana. Ms.
- STORTO, L. (1997). Verb Raising and Word order variation in Karitiana. *Boletim da Associação Brasileira de Linguística (ABRALIN) no.20 - Homenagem a Aryon Dall'igna Rodrigues*.
- STORTO, L. (1998). Karitiana: A verb Second Language from Amazonia. In *Proceedings of the Sixth Conference of Students of Linguistics of Europe (CONSOLE)*.
- STORTO, L. and P. Baldi (1994). The Proto-Arikem Vowel Shift. Paper presented at the LSA. Ms.
- TRECHSEL, F. R. (1993) Quiché focus constructions. *Lingua* 33-78.
- VIKNER, S. (1995). *Verb Movement and Expletive subject in the Germanic Languages*. Oxford University Press.
- WIESEMANN, U. (1978). Os dialetos da Língua Kaingang and Xokleng. *Arquivos de anatomia e Antropologia, vol. 3*. Instituto de Antropologia Prof. Souza Marques, Rio de Janeiro.
- WILLIAMS, E. (1980) Predication. *Linguistic Inquiry* 11: 203-238.