

# Phonology and Nominal Morphology of Cushillococha Ticuna

Dissertation Prospectus

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## 1 Introduction

The immediate goal of this prospectus is to describe the phonology and morphology of nouns in Cushillococha Ticuna (CT), a language of Peru, based on my primary fieldwork. This description will support further research on the form and meaning of deictic expressions in the language. Phonological and morphological description is a prerequisite to work on deixis because (a) most deictic words in CT are morphologically complex and (b) many deictics contrast with each other only in suprasegmental features such as tone.

The description is organized as follows. §2 provides background information about the social setting in which Ticuna is spoken and the data in this paper. §3 lays out preliminaries to the discussion of phonology and morphology in the following sections. This section includes an overview of the morphosyntactic profile of the language, and it also includes definitions of the theoretical concepts which I use in the body of the sketch.

§§4-6 discuss phonology. §4 describes the surface segment and tone inventory of the language, proposes a phonemic analysis of the inventory, and discusses the phonotactics of underived words. This section also discusses the relative functional load of segmental phonology, suprasegmental phonology, and morphology. §5 describes word-prosodic phenomena other than tone. §6 describes all productive phonological processes, including morphologically conditioned phonology.

§§7-11 turn to morphology. §7 defines the word classes, as relevant to distinguishing nouns from other word classes. §8 discusses morphologically relevant divisions between nouns: noun class, form class, and animacy. §10 describes the noun class system, including noun class skewing, or use of nonprototypical noun class agreement. §11 overviews the language's rich case system and the minimal non-case nominal morphology.

## 2 Background

### 2.1 Classification and demographics

Ticuna is likely an isolate. It has been claimed (Carvalho 2009) to be related to Yuri, an extinct language attested only in a short 19th-century wordlist (Martius 1867:268-272). Carvalho correctly observes that Martius' Yuri data is extremely similar to modern Ticuna, with a variety spoken near Benjamin Constant, Brazil, as his point of comparison. I agree: in fact, the Yuri data is so similar to Ticuna that I am reluctant to characterize 'Yuri' as a distinct language, especially given the poor quality of Martius' transcription. Some evidence suggests that the Carabayo, a people living in voluntary isolation in southern Colombia, may speak a language related to Ticuna (Seifart & Echeverri 2014).

Ticuna is spoken by between 41,500 and 69,000 people across three countries: Brazil (32,500 to 60,000 speakers: Lewis et al. 2014; Instituto Socio-Ambiental 2017), Colombia (2,000, Santos 2004), and Peru (7,000, my estimate). It is among the largest languages indigenous to the Amazon Basin and, according to the Instituto Socio-Ambiental (2017), the single largest indigenous language of Brazil. Ticuna people currently live along the main course of the Amazon River -- roughly, from Santo Antônio do Içá, Brazil, in the east, to the town of Chimbote, Peru, in the west -- and near the mouths of its minor tributaries. In Colombia, they also live on the lower course

of the Putumayo (Iça), a larger tributary of the Amazon, and in the interfluvial area between the Putumayo and the Amazon.

Ticuna people's territory and population have expanded radically over the last two hundred years. An early ethnographer, Curt Nimuendajú (1952:9), estimated in the late 1940s that there were only 3,000 Ticuna people total across the three countries. Even if Nimuendaju's estimate was very low, this means that the population has increased by at least an order of magnitude in 70 years. The total length of the Ticuna settlement area along the Amazon, on the other hand, has not significantly changed since Nimuendajú (1952). This means that many Ticuna towns, including my field site of Cushillococha, have very dense populations.

## 2.2 Dialectology

Montes (2004a) offers a preliminary classification of Ticuna varieties into three groups: eastern fluvial varieties, western fluvial varieties, and interfluvial varieties. (This classification does not involve reconstruction or proposals for tree or network representations of the varieties.) The western fluvial varieties consist of (a) the object variety of this study and (b) the varieties spoken on the main course of the Amazon in Colombia. Montes' eastern fluvial group are the varieties spoken in Brazil, and her interfluvial varieties are those spoken in the Putumayo basin away from the main course of the Putumayo. Based on consultant comments, my own observations of communication between Cushillocochans and Ticuna people from Brazil and Colombia, and published data (Soares 2000; Montes 2004a), CT is totally mutually intelligible with the other western fluvial varieties and the eastern fluvial varieties. There are some phonological and morphological differences: for example, CT displays a sound change of \*a > o preceding labials that is absent in eastern fluvial varieties. On the other hand, published data (Montes 1995, 2004b; Santos 2004) indicates that CT is quite different, especially in morphology and lexicon, from the interfluvial varieties. Santos (2004:85), a linguist and native speaker of an eastern fluvial variety, suggests that the interfluvial varieties are not fully mutually intelligible with any fluvial variety.

Recent migrations, which Montes (2004a) does not discuss, have likely played an important role in forming the object variety of this study. American SIL missionaries Lambert and Doris Anderson lived in Cushillococha intermittently from 1953 to about 1990. During this time, they brought large numbers of people from Brazil, Colombia, and other areas in Peru to Cushillococha so that they could attend the school and SIL-run church there. (Many of these migrants still live in Cushillococha.) Later, the Andersons also encouraged some very small Ticuna settlements in nearby areas in Peru to grow into large towns, usually by establishing schools and installing SIL-trained Cushillocochano schoolteachers in them. Given the wide geographic area of the Andersons' influence, the migration and centralization which they brought about must have caused significant dialect contact. This raises the possibility that modern CT, as spoken by people born after the Andersons' arrival, is a koinē. More dialectological research is necessary to explore this.

Besides the dialectological literature cited above, published descriptions of other Ticuna varieties include Montes (1995, 2004b) on the interfluvial dialect of San Martín de Amacayacu, Colombia; Soares (1986, 2000) on the eastern fluvial dialect of Vendaval, Brazil; and Carvalho (2010, 2012) on the eastern fluvial dialect of Benjamin Constant, Brazil. I do not use data from these works in this description. The Andersons produced three descriptive works on the Cushillococha variety: an article on tone contrasts (Anderson 1959); a textbook for English-speaking missionaries learning Ticuna, which includes an extensive wordlist (Anderson 1962); and an article on syntax (Anderson

1966). These works are useful for their extremely accurate phonetic transcriptions, but they do not present any phonological or morphological analysis. I used the transcriptions extensively in the field.

### **2.3 Field site**

Cushillococha Ticuna (CT) is my own term for the variety of Ticuna currently spoken in the region surrounding Cushillococha and Caballococha, Peru, where I have conducted all of my fieldwork. Cushillococha is a titled indigenous community located in the district and province of Mariscal Ramón Castilla, department of Loreto. Including people who live outside of the legal land claim, it has ~3,000 residents. Caballococha is a multi-ethnic town which is the capital of Ramón Castilla province. It has ~10,000 residents, at least 500 of whom are Ticuna. The nearest large cities to the area are Leticia, Colombia, and Tabatinga, Brazil, both located about 70km away.

Cushillococha and Caballococha are linked by a paved road, which runs 8km from the central plaza of Cushillococha to the plaza in Caballococha. Because of the development and mobility made possible by this road, it is misleading to refer to Cushillococha as a 'village' and Caballococha as a 'city' (although people from Caballococha sometimes do). Cushillococha and Caballococha have similar economies -- in both towns, most people live by a combination of subsistence farming and either cash-cropping or paid work. Likewise, both towns have electricity, public wells, paved streets, and many areas where houses are built in the style of regional cities. Outside the core areas of the towns, along the road, the setting is more rural, with a much lower population density and fewer modernizing public works.

Most non-populated land within a two-hour walk of the center of Cushillococha is used for agriculture or cattle ranching. Because so much land has been cleared for agriculture, there is very little primary forest in the area, and the lakes and rivers have been depleted by overfishing. This makes hunting and fishing unreliable as sources of food. As a result, most families in Cushillococha grow their own plant foods, but have to buy most of their animal food with cash. People obtain cash via paid work, cash-cropping, and collecting and selling forest products from other areas. Cushillocochanos, especially wealthier people and people born before about 1980, are very interested in telling me about the changing economy, the rise of these cash-oriented activities, and the social problems that they have created. In general, though they are glad to have cash themselves, they do not see the changes as good.

The Cushillococha-Caballococha road is usable for roughly eight months of the year. (In the other four, it is flooded.) During the drier months, hundreds of Ticuna people travel back and forth between Caballococha and Cushillococha on a daily basis. Some people do this because they have a paid job or attend school in one place but live in the other. Other people travel between the towns in order to buy or sell goods from one place in the other. Both kinds of movement go in both directions. For example, my consultant SSG lives in Caballococha but teaches school in Cushillococha, while his father-in-law DGG lives in an outlying area of Cushillococha but visits the market in Caballococha almost every day. People speak Ticuna regardless of which place they are in at a given moment. As a result, if you choose the right time of day to walk through the plaza of Caballococha, you will overhear at least as much Ticuna as Spanish. In this, the Caballococha-Cushillococha region is profoundly different from other parts of northern Peruvian Amazonia that I have visited, where it is rare to hear indigenous languages, even very large ones, spoken in public space.

## 2.4 Vitality

Ticuna is the main language of communication in all settings, including school, church, and politics, in Cushillococha. It is also the main informal language in one neighborhood of Caballococha. The language is spoken by almost all ethnically Ticuna people and by a significant number of non-Ticuna people who have married into Ticuna families. Intermarrying groups include Peruvians, Colombians, and Brazilians of *mestizo* and African descent, as well as (highland and lowland) Quechua, Kokama, Bora, Yagua, and Yaneshá indigenous people. While many Cushillocochanos also speak Spanish and/or Brazilian Portuguese, these are used mainly as contact languages. Perhaps half of the town's women are monolingual in CT.

The language is not as secure, though, as its current range of use might suggest. Most ethnically Ticuna children born after about 2000 speak at least some Spanish or Portuguese, and a significant minority of children prefer to speak Iberian languages, using them even with people who do not understand them well. For example, in 2016 I briefly lived with a Ticuna household which consisted of a couple in their seventies and three of their grandchildren, aged about 13, 10, and 8. The woman of the household spoke and understood only a few words of Spanish, but despite this, her grandchildren always addressed her in Spanish. The grandchildren also spoke Spanish to each other, their parents, and their cousins, even though the entire family are fluent, native speakers of CT. I do not know how widespread this behavior is in Cushillococha, but if it is at all common, then CT can be expected to lose substantial ground to Spanish over the next several decades.

Beyond the Cushillococha-Caballococha region, there are six other titled Ticuna settlements in Peru. Many of these towns were founded in the last several decades by people originally from Cushillococha (§2.2). They have a combined total population of ~3,500. According to consultants who have traveled widely in the Ticuna region in Peru, in four of the six towns, the language has roughly the same status as in Cushillococha. In one town, Santa Rosa de Mochila, at least some children are not acquiring Ticuna; in another, Yahuma II, at least some children are not acquiring Spanish or Portuguese.

Based on my own conversations with speakers from other towns in Peru, the varieties spoken there seem to differ from the Cushillococha variety only in the status of some sound changes in progress (§4.1.1). As a result, it would be as appropriate to label the object variety of this study 'Peruvian Ticuna' as 'Cushillococha Ticuna.' Since effectively all Ticuna people in Peru speak the language, this variety has roughly 7,000 speakers.

## 2.5 Data

Data in this sketch comes from my fieldwork in Cushillococha and Caballococha over four months in 2015 and 2016; a wordlist compiled by Doris Anderson (Anderson 1962); and the SIL's translation of the New Testament (Anderson & Anderson 2010). Sources of data from my own work include lexical elicitation, grammatical elicitation, audio-recorded texts (transcribed by me in collaboration with consultants), and overheard speech. I used all of these methodologies during both field trips.

I worked formally with approximately 20 people over the course of the two trips, but the majority of the data comes from six consultants: KSC (2015 only), LCS, DGG, MFC, SSG (2016 only), and LWG (2016 only). The consultants' birth years range from 1942 (DGG) to 1996 (KSC). KSC and LWG are women and the other speakers are men. All of the consultants speak Spanish, though

they do not all speak it equally well. All of them are literate in Spanish and in the SIL's practical orthography for Ticuna.

Most of my grammatical elicitation began with discussion of overheard speech and textual examples. For example, of the five uses of the purposive case discussed in §11.1.4, I discovered only one use -- subordination of a purpose clause -- through elicitation based on translation from Spanish to Ticuna. Of the remaining four uses, I learned about three via textual examples and one via overheard speech. This is representative of my workflow in general.

The contact language for elicitation and text collection was a variety of Spanish. Glosses on elicited and text data are based on the consultants' regional Spanish glosses. Since many of the consultants calque extensively from Ticuna while speaking in Spanish, Spanish glosses were sometimes uninformative. In these cases, I have relied on the consultants' judgments about the contexts in which examples are felicitous, rather than on their Spanish glosses, to render the English glosses here. For reasons of space and informativeness, I do not include Spanish glosses.

Glosses of overheard speech and written texts are my own. Identifiers following examples with the code 'GE' are unique identifiers for elicitation sessions, with the date of the session and a code identifying the speaker. Identifiers following text examples are unique identifiers for texts, with a code identifying the speaker and another identifying the text. Overheard speech examples are given with the code 'OS' followed by the date that I overheard the example. Words in minimal pairs and some phonology examples are not cited. All of these are drawn from a set of tone frame recordings of ~1,200 lexical items made with DGG, LCS, and KSC in August 2016.

### **3 Preliminaries: morphosyntactic and theoretical categories**

Understanding CT phonology requires also understanding some of the language's morphosyntax, especially verb phrase morphosyntax. Likewise, describing phonology and morphology in general requires precise use of descriptive terms. In this section, I provide explicit definitions for the descriptive vocabulary used in the following sections (§3.1). I then give an overview of the general morphosyntactic profile of CT as relevant to phonology and noun phrase morphology (§3.2).

#### **3.1 Theoretical framework and descriptive vocabulary**

My description of the phonology in §§4-6 assumes classic Optimality Theory (Prince & Smolensky 1993). I also draw on Lexical Phonology and Morphology (Kiparsky 1982), for example to distinguish between lexical and postlexical phonology. For description of prosody, I assume standard versions of Autosegmental Phonology (Goldsmith 1976), Metrical Stress Theory (Hayes 1995), and the Prosodic Hierarchy (Hayes 1989; Selkirk 1996).

In the discussion of morphology, the load-bearing theoretical terms are 'morph,' 'root,' 'affix,' 'clitic,' and 'word.' A morph is the minimal sound pattern which can be assigned a meaning. A sound pattern does not need to have fixed segments to qualify as a morph. For example, I analyze the tone patterns of nominal deictics as separate morphs from the segments (§9.1.1). A root is a morph with a lexical meaning. Roots can be morphologically free, that is acceptable in isolation, or they can be bound. Many roots in CT, for example all inalienable nouns, are bound.

Bound morphs are divided into affixes and clitics. I distinguish affixes from clitics based on the criteria proposed by Zwicky & Pullum (1983:503-504) and Anderson (2005). There are many bound morphs in CT for which these criteria return mixed results: they behave like affixes on some of the diagnostics, but clitics on others. I discuss problems involving the clitic/affix distinction in §8.1 and the introduction to §11. CT's inventory of clitics includes proclitics, enclitics, and second-position clitics, but its inventory of affixes includes only suffixes. All suffixes, enclitics, and second-position clitics display the same phonological behavior. Proclitics display different phonological behavior. I write affixes with a leading dash, proclitics with a trailing equals sign, and enclitics and second-position clitics with a leading equals sign. Inalienably possessed nouns behave like enclitics with respect to possessors, but like suffixes with respect to incorporating verb stems. I write them with a leading asterisk to represent this behavior.

I use 'word' in two collocations: 'Prosodic Word' and 'morphological word.' The Prosodic Word is a constituent of the Prosodic Hierarchy which dominates the foot. It is defined only by phonological criteria. I define the morphological word as a phonological constituent such that, for all pairs of two morphs  $x$  and  $y$  in the constituent, no free morph  $z$  can intervene between  $x$  and  $y$  without additional licensing morphology on  $z$ . For example, a verb root and its subject proclitic form one morphological word because no free morph, such as an adverb, can ever intervene between the verb root and its subject proclitic. This is similar to the 'cohesiveness' criterion in Dixon and Aikhenvald's (2002) definition of the 'grammatical word,' but I avoid the term 'grammatical word' because it implicates that phonological constituency is not 'grammatical.'

### 3.2 Morphosyntactic profile

CT is primarily agglutinating in morphology. The verb displays extensive noun incorporation, making the language polysynthetic in the traditional sense, though it does not meet some of Baker's (1996) other criteria for polysynthesis. There is some nonconcatenative morphology as well. A few features, like noun class agreement on deictics, are marked primarily by tone. Other features are marked only by changing the inflection or agreement class of a stem. Changing the agreement class of a noun can encode indefiniteness and social deixis (§10); for some stative verbs, changing inflection class encodes aspect (§3.2.2).

CT also has two kinds of portmanteau morphs. Predicates are marked with subject and object proclitics. These are portmanteaus because they expone both features of the subject or object and the clause type of the clause. Tense-modality-evidentiality (TME) value is also marked by portmanteau morphs. CT has a binary contrast between a more remote value and a less remote value of TME. Clauses with the more remote value of TME tend to be read as remote past, but they can also be read as having reportive evidentiality or as conveying that the action of the clause happened in a distant place. Clauses with the less remote value of TME are compatible with recent past, present, and future readings. For consistency with other literature (Nimuendajú 1952; Anderson 1962; Montes 2004b), I refer to the more remote value of TME as the 'past tense' and the less remote value as the 'nonpast tense.' TME is encoded mainly by suppletive noun class particles, locative deictics, nominal deictics, and words, such as manner deictics, that are morphologically derived from nominal deictics (§7.2).

The alignment of case and subject marking is exclusively nominative-accusative. The alignment of other verbal morphology is predominantly absolutive, scoping over the object of a transitive verb or the subject of an intransitive. The basic constituent orders of the clause are SV and SOV.

The basic constituent order in the noun phrase is Modifier-Noun, except that property concept modifiers and relative clauses are typically postnominal.

### 3.2.1 Word classes

CT displays three open and two closed word classes. The open word classes are nouns, verbs, and adverbs. The closed classes are interjections and particles, defined as monosyllabic grammatical words which cannot bear morphology. Nouns display a basic morphological division into alienably and inalienably possessed nouns, along with many more subtle divisions by form and agreement class. I define the word classes in detail in §7.

As background to the description of phonology, it is important that word classes display strong trends in prosodic size. Among the native vocabulary items in my lexicon of 2037 words, 787 are nouns. 59 of the nominal roots are monosyllabic. The great majority of the other nominal roots are disyllabic or trisyllabic. Of the verb stems, 263 are monosyllabic and 237 are disyllabic or trisyllabic, but at least half of the disyllabic and trisyllabic stems are derived from monosyllabic roots. There are no clearly underived verb roots with four syllables. Adverb roots and interjections are always disyllabic or trisyllabic, and particles are always monosyllabic. Underived words of three syllables or more tend to be loans. Loanwords are numerous and include some basic vocabulary. They come from Tupi-Guaraní languages (Nheengatú, Omagua, and Kokama), Spanish, Portuguese, and lowland Quechua, in descending order of apparent number of loans.

### 3.2.2 The verb

CT verbs bear proclitics which fusionally expone (a) the person, number, and noun class features of the subject and (b) whether the clause is a main clause or a subordinate clause. In clauses where the object has certain person-number-noun class features, object proclitics can also appear. Subject proclitics still appear when there is an overt NP or pronominal subject, but object proclitics are in complementary distribution with overt objects (modulo the syntactic position of the object). I therefore analyze subject proclitics as agreement, but object proclitics as bound pronouns.

The form of subject and object proclitics varies according to the inflection class of the verb stem. Verb stems are divided into four inflection classes. I refer to these classes as the *a*-class, the *i*-class, the *i*<sup>l</sup>-class, and the *ri* class. The first three classes have monosyllabic subject proclitics. They are named for the theme vowel and/or tone which appears in (most of) their proclitics. The *ri* class has disyllabic subject proclitics which end with the syllable *ri*. Most verb stems are *a*-class.

For monomorphemic verb stems, the inflection class of the stem is a mostly arbitrary property of the root with no relation to its semantics and very little relation to its syntax. For derived verb stems, inflection class is determined by the morphological composition of the stem. Some verbal affixes and clitics, for example most directionals, change the stem to a particular inflection class. Other verbal affixes and clitics do not affect the inflection class of the stem. Stems derived with only these morphs have the same inflection class as the bare root. There are some important exceptions to these generalizations about inflection class. For property concept verbs and some psych verbs, it is possible to mark aspect by simply changing the inflection class of the verb, without adding any further morphology. The verb *me*<sup>43</sup>, for example, is a stative verb 'be good'

when it bears *a*-class inflection, but a dynamic verb 'improve (intransitive)' when it bears *i*-class inflection. For motion verbs, inflection class is determined by argument structure.

Verbs bear many other forms of morphology besides subject and object proclitics. Verbal morphology which precedes the root includes associated motion proclitics, proclitics associated with directional constructions, and the imperfective proclitic. Verbal morphology which follows the root includes voice- and valence-altering morphology such as the causative and antipassive; directionals; subordinators; and deverbal derivational morphology such as nominalizers. Incorporated nouns also follow the root. Since the morphological structure of the verb complex is relevant to prosody, I discuss non-agreement morphology on verbs at more length in §5.3.

Discourse in CT is extremely hypotactic, meaning that it displays many more subordinate clauses than main clauses. This is common in languages of northwestern Amazonia (Overall 2007:508). Chained clauses, or clauses that are formally subordinate but not subordinated to a specific verb of the matrix clause, are the most frequent subordinate clause type in discourse. Other kinds of formally subordinate clauses include polar questions; indirect speech reports; the complements of modal, perception, cognition, and phasal verbs; and purpose clauses.

## 4 Phonological inventory

This section describes the phonology of morphologically underived words. I begin with the segmental phonemes and phonotactics (§4.1), then describe lexical tone (§4.2), contrastive laryngealization (§4.3), and contrastive nasality (§4.4).

### 4.1 Segmental phonemes and phonotactics

#### 4.1.1 Consonants

Table 1 displays the surface consonant inventory of CT. Phonemic consonants are enclosed in forward slashes. Consonants which are derived by phonological processes are enclosed in square brackets. The phones [k<sup>w</sup> φ f ɱ] are competing outcomes of a sound change in progress. [ŋ Δ] are competing outcomes of a different sound change. To represent the change in progress, these phones are enclosed in curly brackets. Note that while Table 1 displays glottal stop as phoneme, it is contrastive only in a small number of environments. The phonology of glottal stop is discussed at greater length in §6.4.

Table 1: Surface consonant inventory

	Labial	Alveolar	Palatal	Velar	Glottal
Voiceless Stop	/p/	/t/	/tʃ/	/k/ {k <sup>w</sup> }	/ʔ/
Voiced Stop	/b/	/d/	/dʒ/	/g/	
Fricative	{φ} {f} [v]		[ʒ]		
Nasal Stop	/m/	/n/	/ɲ/	{ŋ}	
Approximant	/w/, {ɱ}	/ɾ/	[j]	{Δ}	

I use IPA symbols for all phones, except that I represent the tap as <r>.

(1) provides a set of segmental minimal pairs illustrating the consonant contrasts. Verb roots are cited in the morphologically bare form. Although the bare form of verb roots is actually read as an event nominalization (for dynamic verbs) or a state nominalization (for stative verbs), for simplicity I gloss the bare forms with English verbs.

(1) Minimal pairs demonstrating consonant contrasts<sup>1</sup>

a. Labials

i. /p/ vs. /b/:

*pu*<sup>3</sup> 'rain (verb)' vs.  
*bu*<sup>31</sup> 'be a child; be immature'

ii. /p/ vs. /m/:

/tʃau<sup>1</sup>-\*pa<sup>3</sup>ti<sup>4</sup>/ tʃo<sup>1</sup>pa<sup>3</sup>ti<sup>4</sup> (1SG-\*fingernail) 'my fingernail' vs.  
/tʃau<sup>1</sup>-\*ma<sup>3</sup>ti<sup>4</sup>/ tʃo<sup>1</sup>ma<sup>3</sup>ti<sup>4</sup> (1SG-\*design) 'my design'

iii. /p/ vs. /w/:

*pq*<sup>1</sup> 'embrace' vs.  
*wq*<sup>1</sup> 'fall, speaking of tree'

b. Alveolars

i. /t/ vs. /d/ vs. /r/:

*tĩ*<sup>4</sup> 'cotton, thread' vs.  
*dĩ*<sup>1</sup> 'palm sp. (probably *Jessenia bataua*)' vs.  
*ri*<sup>1</sup> 'coordinating conjunction; topic marker'

ii. /t/ vs. /n/:

/tʃau<sup>1</sup>-\*te/ tʃau<sup>1</sup>te<sup>4</sup> (1SG-\*husband) 'my husband' vs.  
/tʃau<sup>1</sup>-\*ne<sup>3</sup>/ tʃau<sup>1</sup>ne<sup>3</sup> (1SG-\*son) 'my son'

c. Palatals

i. /tʃ/ vs. /j/ vs. /ɲ/:

*tʃa*<sup>1</sup> 'hand-strain' vs.  
*ja*<sup>2</sup> 'be adult; be mature; grow' vs.  
*ɲa*<sup>1</sup> 'throw sth through the air'

d. Velars

i. /k/ vs. /k<sup>w</sup>/:

*kq*<sup>1</sup> 'fruit sp.' vs.  
*k<sup>w</sup>q*<sup>1</sup> 'know' (< Nheengatú *kua*)

<sup>1</sup>The following abbreviations are used: 1 = first person, 2 = second person, 3 = third person, A = a-class verb/proclitic, ACC = accusative, ADVBZ = adverbializer, AL.POSS = alienable possession enclitic, ALL = allative, AM = associated motion, ANA = general demonstrative (typically anaphoric), ANIM = animate, ANTIPAS = antipassive, ASP = aspectual, CAUS = causative, CLF = classifier, COLL = collective, COM/INST = comitative/instrumental, COMP = complementizer, COND = conditional, COP = copula, DEF.POSS = default possessor (of inalienably possessed noun), DEINTENS = deintensifier, DEM = demonstrative, DIM = diminutive, DIR = directional, DIST = distal, DISTRIB = distributive, DLOC = adlocative/prolocative deictic, DNOM = adnominal/pronominal deictic, EXCL = exclusive, EXIST = existential verb, F = feminine, FUT = future, HESIT = hesitation word, I = *i/i*<sup>1</sup>-class verb/proclitic, IBEN = intransitive beneficiary case, IMPF = imperfective, INAM = inanimate, INCL = inclusive, INDEF = indefinite, INFER = inferential, INFO = information-structural, INTENS = intensifier, LOC = locative, MC = main clause, NCL = noun class particle, NEG = negative, NI = noun incorporation, NMLZ = nominalizer, NPST = non-past, OBJ = object, PL = plural, PRACT = pluractional, POSS = possessive, PR.POSS = promoted possessor, PRED.FOC = predicate focus, PRO = pronoun, PROX = proximal, PST = past, PURP = purposive, QUOT = quotative, RCP = recipient case, RI = *ri*-class verb/proclitic, SBJ = subject, SC = subordinate clause, SG = singular, SGACT = single-actional, SIMUL = temporal overlap subordinate clause, SOURCE = source of motion, SUB = subordinator, TOP = topic, VBLZ = denominal verbalizer.

- ii. /k/ vs. /g/:  
ka<sup>1</sup> 'yell, call' vs.  
ga<sup>2</sup> 'swallow'
- iii. /k/ vs. /ŋ/:  
kq<sup>1</sup> 'fruit sp.' vs.  
ŋq<sup>1</sup> 'be raw'
- e. Glottal
  - i. /ʔ/ vs. ∅:  
/na<sup>43</sup>-\*ti<sup>4</sup>/ na<sup>43</sup>ti<sup>4</sup> (DEF.POSS-river) 'a/the river' vs.  
/na<sup>43</sup>-\*ʔti<sup>4</sup>/ na<sup>43</sup>ʔti<sup>4</sup> (DEF.POSS-WF/HF) 'a/the father-in-law'

Two phonemic consonants are involved in sound changes in progress. The first change is an unconditioned shift of the phone which I transcribe as [k<sup>w</sup>] in (1d) above. In the speech of people born in Cushillococha before about 1955, this phone is realized as [k<sup>w</sup>] or [ϕ]. In the speech of younger speakers, it is typically [m] but sometimes [ϕ] or [f]. [k<sup>w</sup>] is clearly the most archaic realization, as shown by this age-grading and by the fact that the phone is orthographically represented as <cu> and <ku> in older descriptions (Anderson 1959, 1962; Nimuendajú 1952). (2) provides examples of realizations of this phone in the verb root k<sup>w</sup>q<sup>1</sup> 'know.'

(2) Realizations of k<sup>w</sup>q<sup>1</sup> 'know'

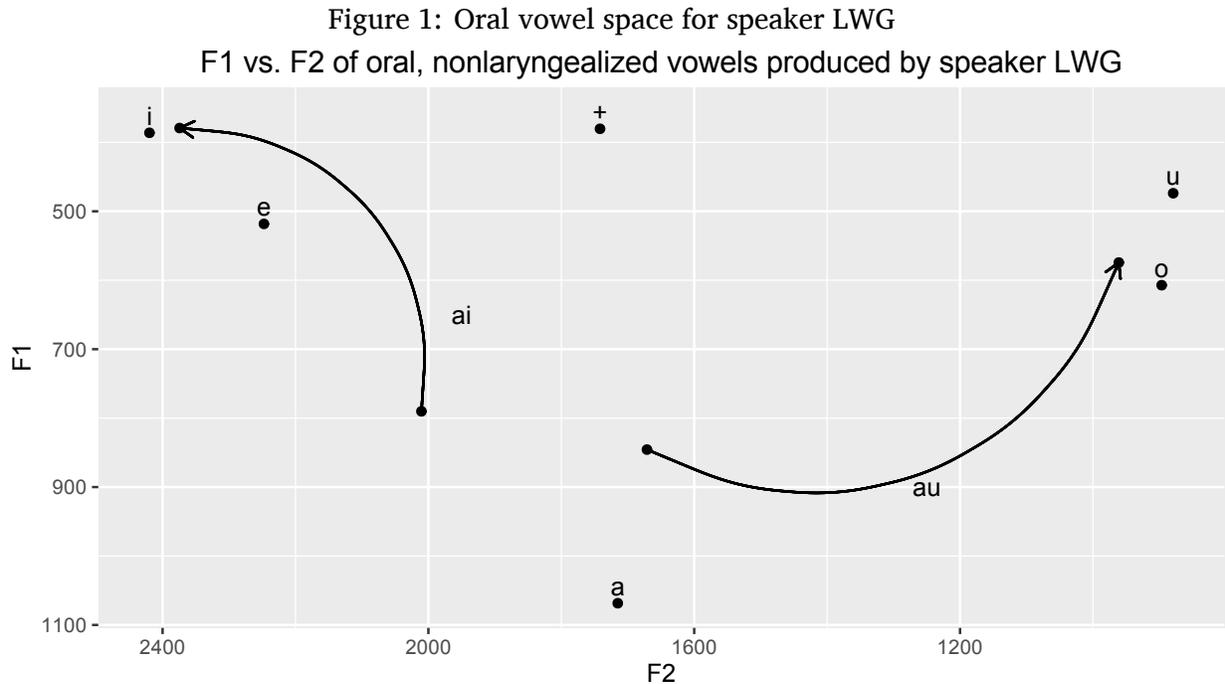
- a. [k<sup>w</sup>q<sup>1</sup>] (DGG, ak + 0:36)
- b. [ϕq<sup>1</sup>] (DGG, GE.20160720)
- c. [mq<sup>1</sup>] (LCS, EGC; LCS, ngu 0:46, GE.EGC.20160709)
- d. [fq<sup>1</sup>] (JGR, GE.20160624)

The second change involves the phone which I transcribe as [ŋ] in (1d) above. While this phone remains [ŋ] in the speech of most Cushillocochanos, it is in the initial stages of an unconditioned shift to a non-nasalized approximant resembling [ʎ]. I have heard the [ʎ]-like realization only in the speech of speakers born after about 1980, and I have rarely been successful in eliciting careful tokens of the phone, as speakers tend to realize it as [ŋ] when asked to repeat recorded examples. This leads me to suspect that the [ʎ]-like realization is due to a fairly recent sound change. (3) provides examples of realizations of this phone in several environments.

(3) Realizations of \*ŋ (GE.DGG.20160611, GE.EGC.20160706, GE.LCS.20150814)

- a. ŋã<sup>1</sup> 'Cuniculus paca': [ŋã<sup>1</sup>] (DGG), [ʎã<sup>1</sup>] (EGC)
- b. ŋq<sup>1</sup> 'be raw': [ŋq<sup>1</sup>] (LWG), [ʎq<sup>1</sup>] (EGC)
- c. ŋa<sup>1</sup> 'scold': [ŋa<sup>1</sup>] (LWG), [ʎa<sup>1</sup>] (EGC)
- d. ŋo<sup>1</sup> 'appear': [ŋo<sup>1</sup>] (MFC), [ʎo<sup>1</sup>] (EGC)
- e. /ŋo<sup>1</sup>-\*a<sup>1</sup>ne<sup>1</sup>/ (appear-\*NI:land) 'dawn': [ŋo<sup>5</sup>a<sup>1</sup>ne<sup>1</sup>], [ŋo<sup>5</sup>o<sup>1</sup>ne<sup>1</sup>] (DGG), [ʎo<sup>5</sup>a<sup>1</sup>ne<sup>1</sup>] (LCS)

It bears mention that /ʎ/ is a common phoneme in languages of the Andes, but is not generally found in Amazonian languages except on the Andean periphery. While the Ticuna region is far from the Andes, large numbers of indigenous Andean people have recently migrated to the Cabballococha area. Additionally, there are several families originally from the Andean periphery -- native speakers of Quechua and Yaneshá, both of which have /ʎ/ and do not have /ŋ/ -- currently living in Cushillococha, and many of them have acquired CT. Contact with the Andean languages



may therefore be contributing to the /ŋ/ > /ʎ/ change. But the seeds of the change are probably not contact-induced: Santos (2004:85) reports that /ŋ/ is devoicing to /ŋ̥/ in all environments in some interfluvial dialects.

#### 4.1.2 Vowels

CT displays six vowel qualities, shown in Table 2. The feature organization in this table is motivated by the behavior of the vowels in assimilatory phonological processes (§6.1-6.2). The only diphthongs, defined as vowel sequences which behave phonologically as a single syllable, are /au/ and /ai/ (§5.1). All other sequences of vowels are heterosyllabic.

Table 2: Vowel quality inventory

	Front	Central	Back
High	i	i	u
Mid	e		o
Low		a	

Figure 1 displays a linear plot of the mean midpoint F1 and F2 of all of the nonlaryngealized oral vowels produced by speaker LWG in a set of tone frame recordings described in detail in §6.3.2. LWG is a woman and was about thirty-five years old at the time of recording. In the figure, diphthongs are plotted with arrows: the origin of the arrow represents the F1 and F2 at the 25% point of the vowel, and the end of the arrow represents the values at the 75% point.

Figure 1 indicates that /i/ is phonetically as well as phonologically a central vowel (§6.2.2) and that it is similar in height to the high noncentral vowels, rather than being mid. The figure also

shows that there is a much greater difference in F1 between the non-low vowels and /a/ than between the high and the mid vowels. This difference is not reduced by correcting the formants for F0 or eliminating tokens with tones 1 and 2 from the data.

All six monophthongal vowels, and both diphthongs, can be either nasalized or laryngealized. Additionally, both diphthongs, and all monophthongal vowels except for /i/, can be simultaneously nasalized and laryngealized. Therefore, there are 31 possible syllable nuclei: 8 oral modal voice nuclei, 8 oral laryngealized nuclei, 8 nasal modal voice nuclei, and 7 nasal laryngealized nuclei.

(4) provides a set of segmental minimal pairs illustrating the vowel quality contrasts.

(4) Minimal pairs demonstrating vowel quality contrasts

- a. /a/ vs. /i/ vs. /e/:  
 $\eta a^1$  'be raw' vs.  
 $\eta i^1$  'steal' vs.  
 $\eta e^1$  'drop, let go of'
- b. /a/ vs. /i/:  
 $ta^4$  'future particle' vs.  
 $t\ddot{a}^4$  'cotton, thread'
- c. /a/ vs. /u/ vs. /o/:  
 $ja^2$  'be adult; be mature; grow' vs.  
 $ju^2$  'die' vs.  
 $jo^1$  'cut with scissors'

## 4.2 Contrastive tone

Ticuna is unique among American languages outside of Mesoamerica for its large inventory of contrastive tones. On the surface, CT displays five level tones and four contour tones. I represent the level tones with integers 1 through 5 (5 is highest) and the contour tones with sequences of two integers.

### 4.2.1 Tonology of native vocabulary words: Level tones

Of the five level tones, four -- 1, 2, 3, and 4 -- occur on monosyllabic lexical words. Tone 5 occurs on monosyllabic grammatical morphs and on disyllabic and larger lexical words, but does not occur on monosyllabic lexical words. (5) presents near-minimal sets of the four lower level tones on monosyllabic, morphologically free lexical words (5a,b) and on monosyllabic inalienably possessed nouns (5c). (6) presents minimal and near-minimal pairs of monosyllabic affixes demonstrating the contrastiveness of tone 5.

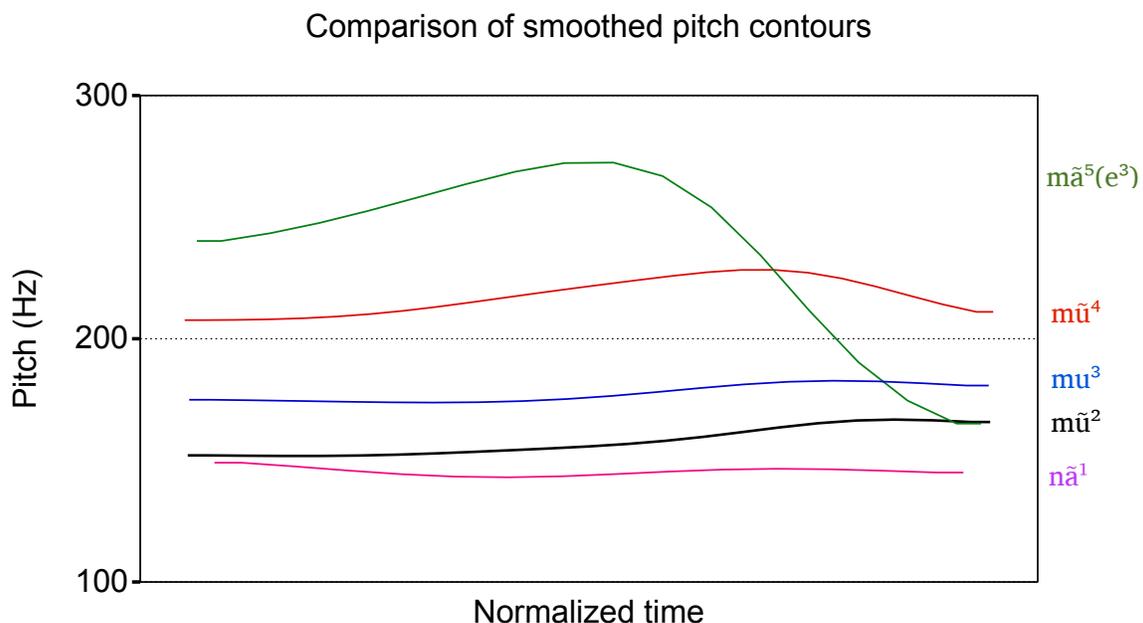
(5) Near-minimal sets demonstrating level tone contrasts

- a. Free word, V
  - i. 1:  $\tilde{a}^1$  'row'
  - ii. 2:  $\tilde{a}^2$  'mosquito'
  - iii. 3:  $\tilde{a}^3$  'give'
  - iv. 4:  $\tilde{i}^4$  'copula verb'

- b. Free word, CV
- i. 1:  $n\tilde{a}^1$  'stop crying, cease to be in pain (verb); respiratory disease (homophonous noun)'
  - ii.  $m\tilde{u}^2$  'give/bring/send/take (animate object, nonsociative)'
  - iii.  $mu^3$  'weave'
  - iv.  $m\tilde{u}^4$  'be numerous'
- c. Inalienably possessed noun, CV
- i.  $/na^{43}\text{-}^*pa^1/ na^{31}pa^1$  (DEF.POSS-<sup>\*</sup>hammock) 'a/the hammock'
  - ii.  $/na^{43}\text{-}^*ti^2/ na^{43}ti^2$  (DEF.POSS-<sup>\*</sup>weeds) 'some/the weeds'
  - iii.  $/na^{43}\text{-}^*\eta pi^3/ na^{43}\eta pi^3$  (DEF.POSS-<sup>\*</sup>commercial.object) 'a/the commercially manufactured object'
  - iv.  $/na^{43}\text{-}^*\eta ti^4/ na^{43}\eta ti^4$  (DEF.POSS-<sup>\*</sup>WF/HF) 'a/the father-in-law'
- (6) Near-minimal sets demonstrating contrastiveness of tone 5
- a.  $=\eta^3$  'accusative case' vs.  $=\eta^5$  'intransitive beneficiary case' (allomorph for monosyllabic bases)
  - b.  $=na^1$  'dative case' vs.  $=wa^5$  'allative case'
  - c.  $po^3ri^1$  'tobacco' vs.  $to^3ri^5$  'turtle sp' (TG,  $\sim$  Omagua *tarikaya*) vs.  $ko^3ri^5$  'boss; non-indigenous/non-Ticuna person' (possibly TG,  $\sim$  Old Omagua *carayoa* 'Portuguese')

Figure 2 shows time-normalized pitch tracks for the four words in (5b), as well as the first syllable of the derived 5.3 word  $m\tilde{a}^5e^3$  (be.long-NMLZ:I), as produced by LWG in the tone frame recordings described in §6.3.2.

Figure 2: Time-normalized pitch tracks of level tones, as produced by speaker LWG



While Figure 2 is based on only one near-minimal set of words, collected from one speaker, it illustrates some attributes of the level tones which are general across most speakers and productions for which I have examined pitch tracks. The most important attribute is that the pitch contours which I call 'level tones' are not absolutely phonetically level. Tone 1 (shown in pink) is relatively level, but tones 2, 3, and 4 all involve a slight phonetic rise. Tone 5 begins with a rise as well, but then sharply falls to approximately the level of tone 2.

#### 4.2.2 Tonology of native vocabulary words: Contour tones

The four contour tones are all falling: 31, 41, 43, and 51. Tone 41 is found only on the subject agreement proclitics for the *i*<sup>1</sup>-class of verbs. Tone 51 is found only on a very small number of lexical words, while tones 31 and 43 have a broader distribution, occurring on both lexical and grammatical morphs. Concretely, there are only 8 lexical words with tone 51 in my lexicon, compared to 78 lexical words with tone 43 and 121 lexical words with tone 31. All of 31, 43, and 51 are contrastive on monosyllabic lexical words, as shown in the near-minimal sets in (7). Because contour tones do not occur on inalienably possessed nouns (§4.5.2), (7) includes only alienably possessed nouns and verb roots.

(7) Near-minimal sets demonstrating contour tone contrasts

- a. V syllable
  - i.  $\tilde{i}^{31}$  'come, go, walk (pluractional)'
  - ii.  $\tilde{u}^{43}$  'come, go, walk (nonpluractional)'
  - iii.  $i^{51}ra^1$  'be small'
- b. CV word
  - i.  $\eta e^{31}$  'be female'
  - ii.  $me^{43}$  'be good'
- c. CV word
  - i.  $ji^{31}$  'become underwater; fall (pluractional)'
  - ii.  $ji^{43}$  'lie in hammock'
  - iii.  $wi^{51}$  'cut with knife'

Figure 3 shows time-normalized pitch tracks for the three words in (7c) as produced by LWG in the tone frame recordings.

Figure 3: Time-normalized pitch tracks of contour tones, as produced by speaker LWG

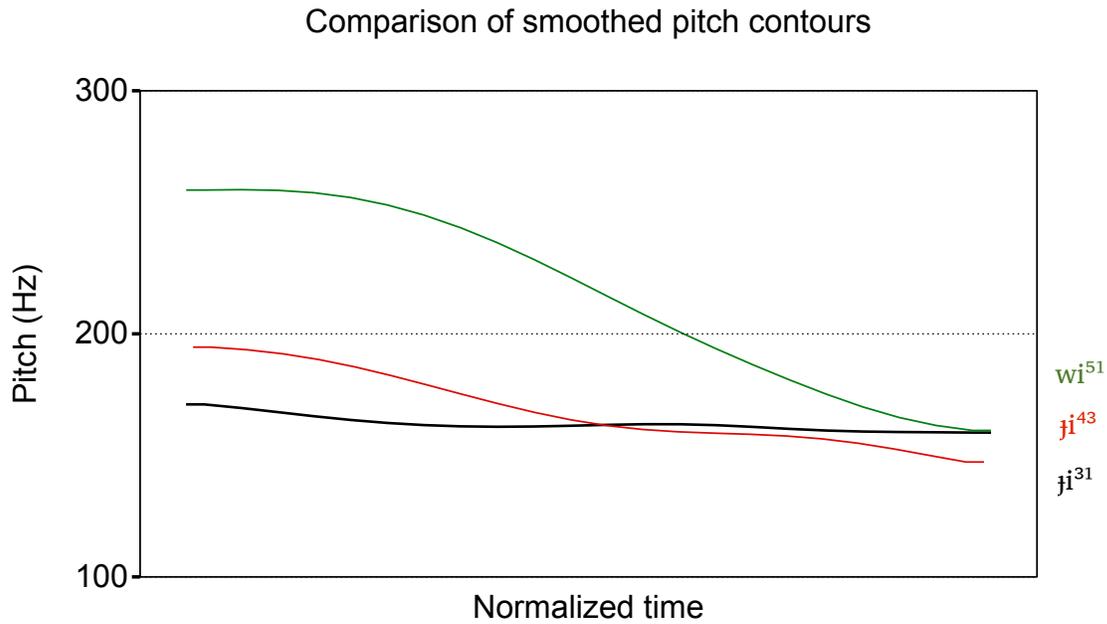
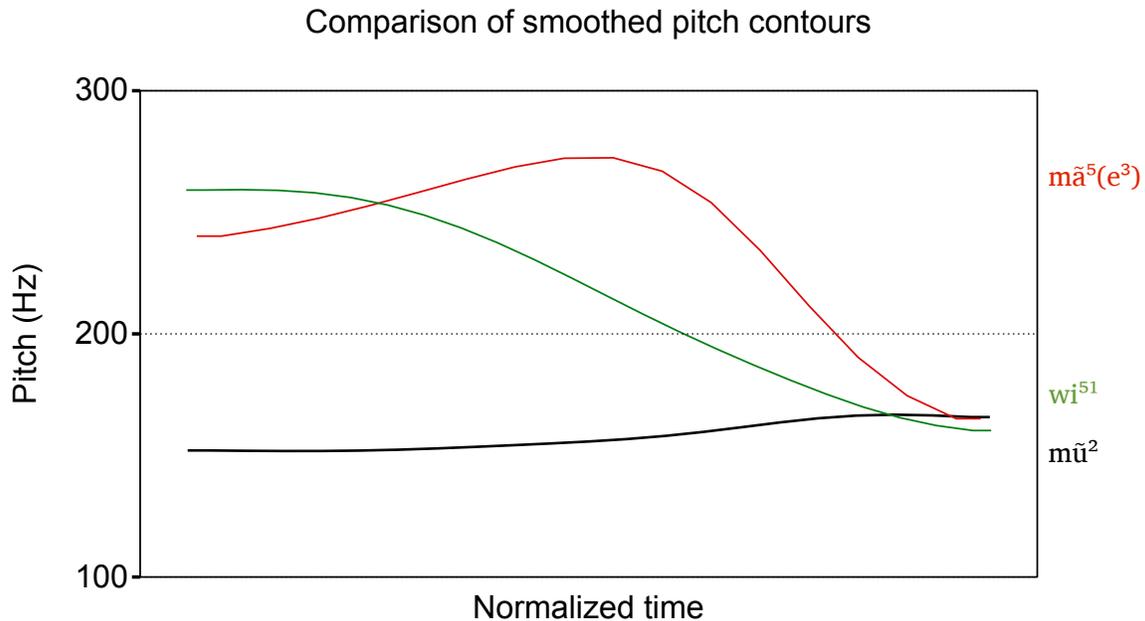


Figure 4: Time-normalized pitch tracks of contour tone 51 and level tones 2 and 5, as produced by speaker LWG



The pitch tracks indicate that all of the contour tones are phonetically falling. Since tone 5 is also phonetically falling, this raises the question of how it contrasts with level tone 51. Figure 4 overlays a time-normalized pitch track of contour tone 51 on pitch tracks of level tone 5 and level

tone 2. This figure shows that tone 51 falls immediately, while level tone 5 rises before falling. Both level tone 5 and contour tone 51, however, have approximately the same final pitch as level tone 2.

On underived disyllabic words, only three level melodies appear: 11, 33, and 44. These are also the only level melodies found on disyllabic inalienably possessed nouns. (8a) provides examples of the underived level melodies on disyllabic free words, and (8b) provides parallel examples for disyllabic inalienably possessed nouns.

(8) Disyllabic words with level tone melodies

a. Free word

- i. 11 vs. 33: *au<sup>1</sup>ra<sup>1</sup>* 'tree sp.' vs. *ma<sup>3</sup>ri<sup>3</sup>* 'now'
- ii. 33 vs. 44: *ma<sup>3</sup>ri<sup>3</sup>* 'now' vs. *ma<sup>4</sup>re<sup>4</sup>* 'bee sp'
- iii. 11 vs. 44: *õ<sup>1</sup>we<sup>1</sup>* 'crab' vs. *ba<sup>4</sup>we<sup>4</sup>* 'turtle sp'

b. Inalienably possessed noun

- i. 11: /tʃau<sup>1</sup>-\*a<sup>1</sup>ne<sup>1</sup>/ *tʃau<sup>1</sup>a<sup>1</sup>ne<sup>1</sup>* (1SG-\*garden) 'my garden'
- ii. 33: /tʃau<sup>1</sup>-\*ĩ<sup>3</sup>na<sup>1</sup>/ *tʃau<sup>1</sup>ĩ<sup>3</sup>na<sup>3</sup>* (1SG-\*domestic.animal) 'my domestic animal'
- iii. 44: /tʃau<sup>1</sup>-a<sup>4</sup>ne<sup>4</sup>/ *tʃau<sup>1</sup>a<sup>4</sup>ne<sup>4</sup>* (1SG-\*WB) 'my brother-in-law (man's wife's brother)'

Underived 22 and 55 free words and inalienably possessed nouns are not attested. It is possible to derive disyllabic 22 words, but there is no morphological process that can derive a disyllabic 55 word (although it is possible to derive a trisyllabic word with initial 55 via the nominalizer tone circle, §6.3.2).

#### 4.2.3 Tonology of native vocabulary words: Disyllabic free words

Disyllabic words with non-level melodies fall into four classes: melodies that rise from a level tone, melodies that fall from a level tone, melodies that rise from a contour tone, and melodies that fall from a contour tone. Because of the phonotactics of contour tones (§4.5.2), there are no melodies that rise or fall to a contour tone.

There are ten mathematically possible disyllabic melodies involving a rise from a level tone. On underived, free disyllabic words, all of these are attested except for 12, 25, and 45. Likewise, there are ten logically possible disyllabic melodies involving a fall from a level tone. Again on underived free words, all of these are attested except for 32 and 53. There are fifteen logically possible disyllabic melodies involving a contour tone on the first syllable. All of the possible melodies beginning with 31 and 43 are attested. Of the logically possible melodies beginning with 51, however, only 51.1 is attested on clearly underived words. 51.3 is found on some words where the status of the word as derived vs. underived is unclear, such as the alienable possession pronouns (§11.2). The other logically possible melodies beginning with 51 occur only on derived words.

In total, of the 40 mathematically possible melodies on disyllabic words, 29 are clearly attested on free, underived words in my data set. All 11 of the gaps involve one of three tones: tones 2, 5, and 51. It is possible that these gaps are coincidental or reflect the relatively small size of my lexical data set. I consider it more likely, however, that the limited number of melodies involving tones 2 and 5 on disyllabic free words is related to the absence of 22 and 55 level melodies from

the inventory. The limited number of disyllabic melodies involving tone 51 is probably related to the extremely low type frequency of this tone (§4.2.1).

#### 4.2.4 Tonology of native vocabulary words: Other disyllabic morphs

The inventory of non-level melodies on disyllabic morphs that are not free words -- inalienably possessed nouns, clitics, and affixes -- is different. In disyllabic morphs that are not free words, six of the ten mathematically possible rises and seven of the mathematically possible falls are unattested. The rises which fail to occur on disyllabic bound morphs are 14, 15, 25, 35, and 45; the falls which fail to occur are 21, 42, and 54. The clear generalization here is that tone 5 is not permitted as the last tone of a bound morph. Tone 2, as in free words, seems to display a restricted distribution, but it remains difficult to say whether this is coincidental.

The data provide no evidence that the manner or place of the medial consonant in a disyllabic word conditions the melody. On the contrary, the tone of underlying /*(C)V*V/ words can condition the insertion of a glottal stop as the onset of the second syllable (§6.4).

Almost all CT words of more than two syllables are either morphologically complex or loans. The lexicon does include some underived, apparently native vocabulary trisyllabic words, such as the inalienably possessed noun \**tʃa<sup>4</sup>ra<sup>4</sup>t<sup>3</sup>* 'belly, egg,' but I have not systematically studied the tonology of these items.

#### 4.2.5 Loanword tonology

There are 155 identifiable loanwords in my lexicon. They come from Tupi-Guaraní languages, Spanish, Portuguese, and Quechua, in descending order of approximate number of loans.<sup>2</sup> Loanwords can be almost categorically identified as such by their tone melody. Disyllabic loanwords almost always display a 31 or 35 tone melody (9). For disyllabic words borrowed from Spanish and Portuguese, the 35 melody occurs only when the word bears final stress in the source language (9c).

##### (9) Tone melodies of disyllabic loanwords

- a. 31: *wo<sup>3</sup>ka<sup>1</sup>* 'cow' (< Spanish or Portuguese *vaca*)
- b. 31: *u<sup>3</sup>i<sup>1</sup>* 'toasted manioc' (< Nheengatú *ui*)
- c. 35: *ma<sup>3</sup>ma<sup>5</sup>* 'mother' (< Spanish or Portuguese *mamá*)
- d. 35: *tu<sup>3</sup>tí<sup>5</sup>* 'mother's brother' (< Omagua *tutira*)

Trisyllabic loanwords typically display the tone melodies 331, 334, or 335 (10). The melodies 334 and 335 are etymologically restricted: they do not occur on native vocabulary words, and all of the loans on which they occur are from Tupi-Guaraní. The melody 331 is less restricted. Loanwords with 331 come from Iberian, Quechua, and Tupi-Guaraní sources. There are also some 331 words that I have not (yet) identified as loans. Many of the apparently native vocabulary 331 words bear a striking resemblance to items in Western Tukanoan languages -- for example, compare

<sup>2</sup>For TG loans, citations for Nheengatú sources are from Anônimo (1938); for Tupinambá, Lemos Barbosa (1951); and for Kokama, Yopán & Murayari (2015). Citations for Omagua are from O'Hagan et al. (2011) and personal communications from Zach O'Hagan, who I thank for help in identifying the loans.

\*pe<sup>3</sup>re<sup>3</sup>ma<sup>1</sup> 'leg' to Máihiki -pere 'CLF:long object with parallel sides' (> *hítìpèrè* 'arm') -- but I have not yet identified systematic correspondences.

Loanwords of four syllables typically have the tone melody 3331. They come from both Tupi-Guaraní languages and Spanish (11). I am not aware of any five-syllable or larger loanwords.

(10) Tone melodies of trisyllabic loanwords

- a. 331: di<sup>3</sup>ẽ<sup>3</sup>ru<sup>1</sup> 'money' (< Spanish *dinero*)
- b. 331: tu<sup>3</sup>pa<sup>3</sup>na<sup>1</sup> 'Christian God' (TG, ~ Nheengatú *tupana*)
- c. 334: pu<sup>3</sup>ra<sup>3</sup>ki<sup>4</sup> 'work' (< Omagua *ipuraka*)
- d. 335: ku<sup>3</sup>ru<sup>3</sup>ru<sup>5</sup> 'frog, generic' (TG, ~ Omagua and Kokama *kururu*)

(11) Tone melodies of tetrasyllabic loanwords

- a. 3331: a<sup>3</sup>ra<sup>3</sup>po<sup>3</sup>ĩ<sup>1</sup> 'harpoon' (< Spanish *harpón*)
- b. 3331: mi<sup>3</sup>ra<sup>3</sup>pe<sup>3</sup>wa<sup>1</sup> 'plank' (TG, ~ Tupinambá *ybyrapewa*)
- c. 3331: to<sup>3</sup>ma<sup>3</sup>ka<sup>3</sup>tʃi<sup>1</sup> 'fish sp' (TG, ~ Omagua and Kokama *tamakitʃi*)

Some trisyllabic and tetrasyllabic loanwords have an alternative kind of tone melody. In this melody, the initial syllable bears a 3 tone, the second syllable bears a 4 tone, and the remaining syllables bear the same lower tone -- either tone 2 or tone 1 (12). This melody can be seen as stress-to-tone adaptation, since the second syllable -- bearing the 4 tone -- is always the syllable that is stressed in the source-language word. Loanwords that have this tone melody are likely more recent than loanwords beginning with two 3 tones, since (a) most of them are from Iberian languages rather than from Tupi-Guaraní or Quechua and (b) they are generally more faithful to the segments of the source language.

(12) Alternative tone melodies on trisyllabic and tetrasyllabic loan words

- a. 341 trisyllabic: pa<sup>3</sup>ne<sup>4</sup>ra<sup>1</sup> 'metal pot' (< Portuguese [pa'nela]) (GE.KSC.20160815)
- b. 342 trisyllabic: i<sup>3</sup>tʃi<sup>4</sup>tu<sup>2</sup> 'Iquitos (place name)' (< Spanish [i.'ki.tos]) (GE.KSC.20160820)
- c. 3422 tetrasyllabic: di<sup>3</sup>ti<sup>4</sup>tʃi<sup>2</sup>a<sup>2</sup> 'Leticia (place name)' (< Spanish [le.'ti.sja]) (DGG, dit 0:17 and passim)

Some loanwords from Tupi-Guaraní, such as *kwq<sup>1</sup>* 'know' (~ Nheengatú *kua*) and the inalienably possessed noun \**tʃi<sup>5</sup>ru<sup>1</sup>* 'clothes' (< TG, ~ Omagua *firu*) depart from the loanword tonology rules outlined above. Likewise, the phonology of personal names of Spanish and Portuguese origin is unusual. They undergo truncation and idiosyncratic segmental changes, and often fail to conform to the loanword tonology rules.

#### 4.2.6 Phonological status of the tones

Ticuna displays no productive tone spreading or external tone sandhi. To my knowledge, the only productive morphophonological processes affecting tone are stress-conditioned tone dissimilation (§6.2.4) and a tone circle affecting the last syllable of verb stems in certain morphological environments (§6.3.2). Consequently, the main evidence for analysis of the tones as underlying or derived comes from the static distribution of tones in the lexicon and the loanword tonology.

Given the data presented in the two preceding sections, I propose the phonemic analysis of the tone inventory shown in (13).

- (13) Phonological status of tones
- a. All five level tones are phonemic and exist in the underlying representation.
  - b. The tone-bearing unit (TBU) is the syllable, as defined in §5.1.
  - c. Tones are assigned to TBUs from right to left in the autosegmental representation. Tones 1, 3, and 4 may spread left. Tones 2 and 5 cannot spread. The domain of tone association is the (segmentally contentful) morpheme.
  - d. The contour tones are not phonemic. They result from the assignment of two tones to a single TBU. This occurs when a morpheme has too few TBUs to accommodate all of its tones.
  - e. TBUs which cannot be assigned a tone, for example because they come into being through processes which are ordered after tone assignment, are assigned tone 3 as a default.

Three facts support the analysis of tone assignment as occurring from right to left. First, all allotony operates from right to left: nominalizers impose a tone circle on the syllable that precedes them, and tone 1 and  $\underline{1}$  syllables impose allotony on tone  $\underline{1}$  syllables that precede them in certain word-prosodic contexts. There is no allotony in which the tone of a syllable to the left affects the tone of a syllable to the right. Second, the fact that most loanwords (*qua* underived words of more than two syllables) display one tone on all nonfinal syllables and another tone on the final syllable suggests that these words have only two underlying tones: one associated with the final syllable, one associated with all nonfinal syllables. This structure can be produced easily in a model in which tones are associated with TBUs from right to left. Third, right-to-left assignment accounts very simply for the fact that contour tones occur only on the first syllable of roots and subject proclitics (§4.5.2).

The tonemic analysis in (13) has several consequences for analysis of the facts described in this subsection. The most important is this: the claim that all five tones are phonemic means that the gaps in the inventory of non-level melodies (§4.5.2) cannot be derived from the representations. Instead, they must be stipulated. Specifically, we must stipulate the bans on monosyllabic tone 5 words, the ban on bound morphs and verb roots ending with tone 5, the absence of rising contour tones, and the absence of most mathematically possible falling contour tones.

The analysis of contour tones in (13) also has undesirable consequences for analysis of the nominalizer tone circle (§6.3.2). The claim that contour tones are not phonemic predicts that syllables with contour tones should behave, in the tone circle, like syllables which bear the level tone that occurs at the end of the contour. That is, 51 and 31 should both behave like 1, and 43 should behave like 3. This prediction is incorrect: 51 patterns apart from all other tones in the tone circle, and 43 patterns apart from 3, although 31 can be viewed as patterning with 1.

### 4.3 Contrastive laryngealization

Contrastive laryngealization occurs only on syllables with tone 1. (14) provides minimal and near-minimal pairs illustrating the contrastiveness of laryngealization. Laryngealization can occur on all vowel qualities. While it does not occur on /i/ in monosyllabic words, /i/ can be laryngealized in larger words and affixes, for example in the inalienable noun \* $k_i^1 \tilde{a}^1$  'clan.'

- (14) Minimal and near-minimal pairs illustrating contrastive laryngealization

- a. /a/:  $ng^1$  'fall into trap' vs.  $n\tilde{a}^1$  'stop crying, cease to be in pain'
- b. /i/:  $\eta i^1$  'steal' vs.  $\eta i^4$  'get married'
- c. /e/:  $\eta e^1$  'drop' vs.  $\eta e^{31}$  'be female'
- d. /u/:  $du^1ru^1$  'tremble' vs.  $du^1ru^1$  'thunder'
- e. /o/  $o^1$  'wound' vs.  $o^1$  'fruit, generic'
- f. /o/:  $to^1$  'Night Monkey (*Aotus* sp)' vs.  $to^1$  'other'

Laryngealized tone 1 ( $\underline{1}$ ) syllables contrast with sequences of a vowel followed by glottal stop, including when the glottal stop is syllabified as a coda. Three facts demonstrate this contrast. First, when a glottal-stop-initial affix or clitic is added to a word with a final modal voice vowel, that vowel remains modal voice rather than becoming laryngealized. This holds for both  $\text{?V}$ -initial and  $\text{?CV}$ -initial morphs, as shown in (15).

(15)  $\text{V}^1\text{?(C)V}$  contrasts with  $\text{V}^1\text{?(C)V}$

- a.  $\text{V}^1$  vs.  $\text{V}^1 / \text{?V}$ :  $to^1\text{?o}^5\text{?fi}^1$  vs.  $to^1\text{?o}^5\text{?fi}^1$   
 $to^1$  =  $\text{?i}^5\text{?t?i}^2$  vs.  $to^1$  =  $\text{?i}^5\text{?t?i}^1$   
 Night.Monkey = INTENS vs. other = INTENS  
 'really a Night Monkey' (GE.MFC.20160727) vs. 'really another one' (GE.MFC.20160727)
- b.  $\text{V}^1$  vs.  $\text{V}^1 \rightarrow \text{V}^1 / \text{?V}$ :  $to^1\text{?t?i}^5\text{ru}^1$  vs.  $to^1\text{?ka}^1$   
 $to^1$  =  $\text{*?t?i}^5\text{ru}^1$  vs.  $to^1$  =  $\text{?ka}^1$   
 Night.Monkey \*clothes vs. other = PURP  
 'Night Monkey's clothes' (GE.MFC.20160805) vs. 'for another one' (GE.MFC.20160719)

Second, in certain prosodic environments, tone  $\underline{1}$  syllables undergo tone dissimilation (§6.2.4). This process does not target modal tone 1 syllables, nor does it target syllables with other tones, even when they are followed or closed by glottal stop. And third, when subject to the nominalizer tone circle, underlyingly tone  $\underline{1}$  syllables surface as tone 5, while modal tone 1 syllables surface as tone 1 or tone 3 (§6.3.2). This would not be predicted if tone  $\underline{1}$  syllables were underlyingly 1 syllables closed by glottal stop.

I therefore analyze laryngealization and tone 1 as separate features of tone  $\underline{1}$  syllables. The morphophonological behavior of tone  $\underline{1}$  syllables, however, could also motivate an analysis of laryngealization and tone on these syllables as related exponents of a single feature. Although I consider this analysis feasible, I prefer the analysis of tone and laryngealization as orthogonal because of laryngealization spreading (§6.1.5).

#### 4.4 Nasality

Nasality is contrastive in CT, but its distribution is unusual in areal perspective. In native vocabulary words, contrastive nasality is permitted only on the vowels of onsetless syllables and vowels in syllables where the onset is either a sonorant consonant or a glottal stop. Thus  $V$ ,  $\tilde{V}$ ,  $wV$ ,  $w\tilde{V}$ ,  $rV$ ,  $r\tilde{V}$ ,  $NV$ ,  $N\tilde{V}$ ,  $\text{?V}$ , and  $\text{?}\tilde{V}$  are all possible, contrastive syllable types. Nasality is banned, however, on the vowels of syllables in which the onset is a supralaryngeal oral stop, whether voiceless or voiced. That is,  $TV$  and  $DV$  are licit but  $\text{*T}\tilde{V}$  and  $\text{*D}\tilde{V}$  are banned. The ban on  $D\tilde{V}$  is very common areally -- for example, it is shared by all Tukanoan languages except for Siona and Secoya -- but

is usually the result of nasal harmony, which is clearly not present in Ticuna. Furthermore, I am not aware of any other Amazonian language which has nasal vowels but bans  $T\tilde{V}$ .

(16) provides minimal and near-minimal pairs demonstrating the contrastiveness of nasality in onsetless syllables. (17) gives equivalent examples for syllables with /w/ onsets, and (18) for syllables with nasal stop onsets. My lexicon has no examples of nasal vowels in syllables with /ɲ/ as the onset. Since nasality is contrastive following the three other nasals, I do not take this as evidence that [ɲ] is derived by nasal harmony. Instead, I assume that the absence of nasality following /ɲ/ is due to this consonant's prosodically restricted distribution (§4.5) and low type frequency (my lexicon has only 15 roots with /ɲ/, compared to 253 with /n/, 263 with /m/, and 144 with /ŋ/).

(16) Nasal vs. oral vowels in V syllables

- a. /a/:  $a^1$  'be thin' vs.  $\tilde{a}^1$  'row'
- b. /i/:  $i^4$  'NCL:IV' vs.  $\tilde{i}^{43}$  'house'
- c. /e/:  $e^{43}$  'fall, speaking of water level' vs.  $\tilde{e}^1$  'close, speaking of a wound'
- d. /u/:  $u^3$  'say' vs.  $\tilde{u}^{43}$  'come, go, walk (nonpluractional)'
- e. /o/:  $o^{31}$  'be unwilling' vs.  $\tilde{o}^2$  'believe'

(17) Nasal vs. oral vowels in wV syllables

- a.  $w\tilde{e}^1$  'be straight, speaking of path' vs.  $w\tilde{w}\tilde{i}^1$  'explode'

(18) Nasal vs. oral vowels in NV syllables

- a. /m/:  $m\tilde{a}^1$  'hit, kill' vs.  $m\tilde{a}^1$  'be long'
- b. /n/:  $n\tilde{a}^4$  '3.III/IV inalienable possessor' vs.  $n\tilde{a}^4$  'smoke to preserve'
- c. /ŋ/:  $\eta\tilde{o}^1$  'appear' vs.  $\eta\tilde{o}^1$  'eat, bite'

There is some nasalization on phonologically oral vowels that follow nasal stops, especially when the vowel is also followed by a nasal stop. Phonologically oral and phonologically nasal vowels following nasal stops differ, however, in two ways. First, nasality lasts the entire duration of a phonologically nasal vowel, while the nasality of a vowel which is phonologically oral but follows a nasal stop abates by the midpoint of the vowel. Second, when a phonologically nasal vowel precedes an oral stop, there is a noticeable excrescent nasal stop preceding the oral stop. This does not occur in an NV sequence followed by an oral stop (19).

(19) Excrescent nasals distinguish NV and  $N\tilde{V}$  sequences (GE.SSG.20160718)

- a.  $N\tilde{V} + T$ :  $[na^4\eta\tilde{a}^{3n}ta^4\eta a^2]$   
 $na^4 = \quad \quad \quad \tilde{a}^3 \quad *ta^4\eta a^2$   
 3.NonI.SBJ.MC.A = have \*kin.term  
 's/he has ChCh/BCh/ZCh/MBCh'
- b.  $NV + T$ :  $[na^4\eta e^4ta^4\eta a^2]$   
 $na^4 = \quad \quad \quad \eta e^4 \quad *ta^4\eta a^2$   
 3.NonI.SBJ.MC.A = lack \*kin.term  
 's/he does not have ChCh, etc.'

Despite the ban on  $T\tilde{V}$  and  $D\tilde{V}$  syllables in the native vocabulary,  $T\tilde{V}$  and  $D\tilde{V}$  syllables do occur in loanwords. They also sometimes occur on the surface in native vocabulary words as the result of postlexical nasal spreading (§6.1.6).

## 4.5 Phonotactics

### 4.5.1 Segmental phonotactics

CT bans many of its phonemes, especially consonants, from appearing in certain positions in the word. It also bans certain CV sequences from all positions. In this section, I define the positions in which specific phonemes are banned by reference to morphological categories. In §5, I then propose an analysis of word-level stress based, in part, on this phonotactic evidence.

In my lexicon, the consonants /k<sup>w</sup>/, /d/, /ɲ/, and /ŋ/ and the diphthongs /ai/ and /au/ all display the same restricted distribution. They can appear in the first syllable of (a) a verb root, (b) an alienably possessed noun root, or (c) an adverb or interjection. They also appear in (d) the first syllable of inalienable possession pronouns and (e) the first syllable of subject proclitics (but not object proclitics). In native vocabulary, they do not appear in any other positions in morphs of these classes.<sup>3</sup> These phones also never appear in (a) inalienably possessed noun roots, (b) suffixes, (c) clitics, or (d) particles. There are no phonological processes which could potentially create /k<sup>w</sup>/, /d/, /ɲ/, or /ŋ/ in banned positions. Phonological processes which involve copying vowels, such as assimilation of noncentral vowel-/i/ sequences (§6.2.2) and repairs of underlyingly /CV?/ words (§6.4.7), never create a sequence of two diphthongs. Diphthongs subject to these processes are instead split into two monophthongal syllables.

The vowel quality /o/ displays a similarly restricted distribution in native vocabulary words. It appears only as the first nucleus in verb roots and alienably possessed nouns, except that it may also occur as the second nucleus if (a) the first nucleus is also /o/ and (b) the second syllable is onsetless or has glottal stop as its onset.<sup>4</sup> That is, (C)o and (C)o(?)o are licit shapes, but \*CV(C)o and \*(C<sub>1</sub>)oC<sub>2</sub>o with supralaryngeal C<sub>2</sub> are not. (C)o(?)o shapes occur in the lexicon, for example in the item o<sup>2</sup>?õ<sup>4</sup> 'newborn baby,' and can also be derived by assimilation (§6.2). This is a point of contrast between the diphthongs and /o/. Morphophonology cannot create diphthongs in the second syllable, but it can create tokens of /o/ there.

While the phonotactics of the restricted consonants and vowels refer to position in the word, there are also phonotactic bans which are not sensitive to position. These involve sequences of oral velar stops followed by front vowels. First, the voiced velar stop /g/ cannot be followed by either of the front vowels /i e/. Since there are no /g/-final morphemes and the lexical phonology includes no regressive assimilation of vowel quality, this restriction is never violated by morphology or lexical phonology. Surface /gi/ sequences can appear, however, as the result of postlexical /i/-fronting (§6.1.3). I have no evidence for surface /ge/ sequences. Sequences of the voiceless velar stop /k/ followed by /i e/ are possible. /ki/, however, appears only in two grammatical morphs -- the 2SG *i*-class and *i*<sup>1</sup>-class subject proclitics, where it is likely historically derived from a sequence \*ku<sup>3</sup>-\*i<sup>3(1)</sup> -- and no lexical words. /ke/ appears in 14 lexical words.

The only phonotactic restrictions on the distribution of nasal vowels are the bans on TṼ and DṼ syllables. Glottal stop does not appear word-initially. A large number of interacting phonological and morphological rules govern the distribution of glottal stop in other positions. I discuss these rules separately in §6.4.

<sup>3</sup>/ɲ/ can appear after the first syllable in Iberian loanwords, such as na<sup>3</sup>ra<sup>3</sup>ɲa<sup>1</sup> 'orange' < Spanish *naranja*.

<sup>4</sup>/o/ is allowed after the first syllable in Iberian loanwords, such as a<sup>3</sup>ra<sup>3</sup>po<sup>3</sup>ɿ < Spanish *harpón*.

#### 4.5.2 Laryngeal phonotactics

CT imposes restrictions on the distribution of contour tones, tone 1 syllables, and tone 5 syllables in the word.

Contour tones -- exactly like /k<sup>w</sup>/, /d/, /ɲ/, /ŋ/, /o/, /au/, and /ai/ -- can appear only in the first syllable of (a) a verb root, (b) an alienably possessed noun root, or (c) an adverb or interjection. They also appear on (d) the first syllable of inalienable possession pronouns and (e) the first syllable of subject proclitics and portmanteau subject-object proclitics. They do not appear in non-first syllables in morphs of these classes, nor do they appear in inalienably possessed noun roots, suffixes, clitics, or particles. Contour tones do not undergo any alternations which are clearly related to these distributional restrictions.

The distribution of tone 5 is limited in a different way. It does not occur as the tone of monosyllabic lexical words, although it does occur on monosyllabic grammatical morphemes. There are many gaps involving tone 5 in the inventory of disyllabic melodies, and it is never the last tone of a verb root, inalienably possessed noun, suffix, or clitic. Despite these restrictions on its distribution, tone 5 does not appear to be marked in terms of morphotonological activity. It does not undergo any morphotonological alternations, and at least two morphotonological processes take syllables of other underlying tones to surface tone 5.

As a summary of this subsection, (20) displays a table showing the segments and tones possible in the first syllable of verb roots, alienable noun roots, pronouns, and subject proclitics (20a) with those possible in the second syllable of morphs in these classes and in bound morphs other than subject proclitics (20b).

(20) Segmental and tonal contrasts licensed by position in the word and morph class

- a. Privileged position: first syllable of verb roots, alienable noun roots, pronouns, and subject proclitics

Consonants					
	Labial	Alveolar	Palatal	Velar	Glottal
Voiceless Stop	/p/	/t/	/tʃ/	/k/ {k <sup>w</sup> }	/ʔ/
Voiced Stop	/b/	/d/	/ʒ/	/g/	
Nasal Stop	/m/	/n/	/ɲ/	{ŋ}	
Approximant	/w/	/r/			
Nuclei	/a e i o u i au ai/				
Tones	1̣, 1, 2, 3, 4, 5; 31, 43, 41, 51				

- b. Less privileged position: all nonfirst syllables of verb roots, alienable noun roots, pronouns, and subject proclitics; all syllables in bound morphs other than subject proclitics

Consonants					
	Labial	Alveolar	Palatal	Velar	Glottal
Voiceless Stop	/p/	/t/	/tʃ/	/k/	/ʔ/
Voiced Stop	/b/		/ʒ/	/g/	
Nasal Stop	/m/	/n/			
Approximant	/w/	/r/			
Nuclei	/a e i u i (o)/				
Tones	1̣, 1, 2, 3, 4, 5				

#### 4.6 The functional load of suprasegmental features

Despite the large number of suprasegmental contrasts in the language, the functional load of suprasegmental features in conveying lexical meaning is relatively low. This reflects that, in most cases, the classifying parts of the language's morphology -- its verb inflection classes and noun classes -- reinforce the contrasts between morphs that are in suprasegmental minimal pairs.

First, most verb roots are monosyllabic, and at least half of them are in at least one suprasegmental minimal pair. But in most cases where two verb roots are in a suprasegmental minimal pair, they are in different inflection classes. This entails that, when the verb roots appear with their inflectional proclitics, the contrast between the roots is supported by the form of the proclitic as well as the form of the root. For example, consider the verb roots  $\eta u^1$  'learn,'  $\eta u^3$  'arrive,'  $\eta u^3$  'be sufficient,' and  $\eta u^{31}$  'fall (nonpluractional).' One pair of these verb roots is homophonous --  $\eta u^3$  'be sufficient' and  $\eta u^3$  'arrive' -- and the others form a minimal laryngeal features set. But all four verb roots also have different morphological features:  $\eta u^1$  is a typical *a*-class verb,  $\eta u^3$  is an *a*-class verb and also obligatorily takes the pre-proclitic  $i^5=$ ,  $\eta u^3$  is an *i*-class verb, and  $\eta u^{31}$  is a  $ri^3$ -class verb. Because of these differences in inflection class, inflected forms of the verb roots display differences in the segments and tones of the inflectional material as well as in the tones of the roots. For example, the third person, non-Class I forms of the verbs are  $na^4 = \eta u^1$  's/he learns,'  $i^5 = na^4 = \eta u^3$  's/he arrives,'  $ni^{43} = \eta u^3$  'it is sufficient,' and  $na^4 ri^3 = \eta u^{31}$  's/he falls.'

There are some constructions in which all differences in inflection class are neutralized, such as the zero nominalization, the agent/instrument nominalization, and the distributive construction. Only in these contexts, none of which are especially common, does the contrast between roots in minimal tone and laryngealization sets actually hinge on the laryngeal features of the root. In all other contexts, contrasts among verb roots are also at least partially supported by inflection.

Second, most noun and adverb roots, as well as most suffixes and clitics, are disyllabic or larger. Because of the larger size of these items, few of them are in suprasegmental minimal pairs. When they are, morphology again helps to support the contrasts. Nouns trigger noun class agreement on their modifiers and, in many syntactic contexts, obligatorily co-occur with particles expounding noun class agreement. This means that even if two nouns are in a segmental minimal pair, noun class agreement is likely to distinguish them in context. Likewise, when two affixes or clitics are in a suprasegmental minimal pair, they often have different morphological effects on the word which contains them. For example, the directional suffix  $-\tilde{a}^2 t\tilde{f}i^4$  'from water to land' is in a minimal tone pair with the clitic  $=\tilde{a}^4 t\tilde{f}i^4$  'briefly,' but the directional changes the inflection class of the verb to the *a*-class and adds an  $i^5=$  pre-proclitic to the verb, while the clitic has no effect on the verb's other morphology.

While the functional load of tone in distinguishing lexical items is low, the functional load of tone in achieving grammatical contrasts is very high in some contexts. In the noun phrase, noun class agreement on some nominal deictics and noun class particles is conveyed only by tone (§9.1.1). So is the contrast between nominal and locative deictics (§11.1.8). In the verb phrase, subordination is marked primarily by changing the tone of the final syllable of the verb root (§6.3.2) and lowering the tone of subject proclitics (§6.3.4). One way of understanding this asymmetry is that because tone is not crucial in achieving lexical contrasts, it can be manipulated to achieve grammatical contrasts.

## 5 Word prosody

This section describes aspects of prosody other than tone. I begin with syllable structure (§5.1). In §5.2, I then argue that CT also displays stress. One crucial claim of my stress analysis is that inflected verbs -- which are one morphological word -- contain multiple stress domains. §5.3 discusses the implications of this claim.

### 5.1 Syllable structure

(21) gives the syllable template for CT.

(21) Syllable template  
(C)V<sub>1</sub>(V<sub>2</sub>)(?)

Modulo the word-level phonotactics, C can be filled by any consonant. If both the V<sub>1</sub> and the V<sub>2</sub> slots are filled, V<sub>1</sub> must be /a/ and V<sub>2</sub> must be /i/ or /u/. Whether both V<sub>1</sub> and V<sub>2</sub> are filled has no effect on whether the coda may also be filled by glottal stop. (C)au? and (C)ai? are possible syllables, for example in the word *dau<sup>5</sup>?ke<sup>1</sup>* 'upriver/west.'

All vowel sequences other than /au/ and /ai/ are heterosyllabic. By this, I mean that /au/ and /ai/ pattern together, with monophthongal vowels, and away from all other vowel sequences in four phonological and morphological phenomena: (a) assimilation of noncentral vowel-/i/ sequences (§6.2.2), (b) tone dissimilation (§6.2.4), (c) syllable-counting allomorphy (§11.1.3), and (d) the nominalizer tone circle (§6.3.2). Assimilation of noncentral vowel-/i/ sequences and tone dissimilation are phonological phenomena which, briefly, take place only in the first two syllables of the Prosodic Word. (C)au and (C)ai sequences count as a single syllable for these processes, and other vowel sequences count as two syllables. Syllable-counting allomorphy in CT recognizes two categories of bases: monosyllabic and polysyllabic. Bases of the form (C)ai and (C)au again count as monosyllabic for these processes, while other bases of the form (C)VV count as polysyllabic. The nominalizer tone circle is a complex set of tonal alternations that affects the final syllable of the verb stem in certain morphological contexts. (C)au and (C)ai sequences behave as a single TBU in the tone circle. Other CVV sequences behave as two TBUs. Note that all of these claims relate only to tautomorphic (C)au and (C)ai sequences. I do not have data on morphologically derived (C)au and (C)ai sequences, although it is notionally possible to create them.

Morphs are always composed of an integer number of syllables, except that morphs which are never first in the Prosodic Word may have an initial glottal stop. Another way of saying this is that morphs cannot have supralaryngeal final consonants.

### 5.2 Foot structure

The central claim of this section is that CT, in addition to tone, also displays stress. Stress is fixed by morphological structure. In words other than verbs, it occurs on the first syllable of the morphological word. In verbs, there is one stress on the first syllable of subject proclitic and another on the first syllable of the verb root. I analyze this as reflecting a system of syllabic trochees aligned with the left edge of the root and the left edge of the proclitic group.

Stressed syllables display a duration of 125% to 150% of the duration of unstressed syllables in texts, but decline to less than 120% the duration of unstressed syllables in words recorded in tone frames. (I assume that this reflects prosodic properties of the tone frame.) Here I focus not on the acoustics of stress, but on phonological evidence for stress from lexical phonology, phonotactics, and fast speech processes. I discuss stress on nouns and adverbs in this section and verbs in §5.3.

Lexical phonology displays two major stress-conditioned phenomena: assimilation of noncentral vowel-/i/ sequences and tone 1̣ dissimilation. Noncentral vowel-/i/ assimilation occurs when an affix, clitic, or inalienably possessed noun beginning with /i/ or /ʔi/ follows a monosyllabic noun or pronoun ending with any non-central vowel. When the process applies, /i/ completely assimilates to the place and nasality features of the base-final vowel (22). When an affix with initial /i/ or /ʔi/ attaches to a disyllabic or larger base, on the other hand, assimilation is impossible (50). The tones of the base and affix do not affect this process.

- (22) Assimilation of noncentral vowel-/i/ sequences: Occurs with monosyllabic (C)V base (GE.DGG.20160730)
- /ŋi<sup>43</sup>-\*ʔi<sup>4</sup>ne<sup>1</sup>/ (3F-\*entire.body) → [ŋi<sup>43</sup>ʔi<sup>4</sup>ne<sup>1</sup>] 'her entire body'
  - /ku<sup>43</sup>-\*ʔi<sup>4</sup>ne<sup>1</sup>/ (2SG-\*entire.body) → [ku<sup>43</sup>ʔu<sup>4</sup>ne<sup>1</sup>] 'your entire body'
  - /to<sup>1</sup>-\*ʔi<sup>4</sup>ne<sup>1</sup>/ (other-\*entire.body) → [to<sup>1</sup>ʔo<sup>4</sup>ne<sup>1</sup>] 'entire body of other (one)'
- (23) Assimilation of noncentral vowel-/i/ sequences: Fails to occur with disyllabic and larger bases (GE.DGG.20160730)
- /o<sup>1</sup>ʔi<sup>5</sup>-\*ʔi<sup>4</sup>ne<sup>1</sup>/ (old.man-\*entire.body) → [o<sup>1</sup>ʔi<sup>5</sup>ʔi<sup>4</sup>ne<sup>1</sup>] 'entire body of old man'
  - /no<sup>31</sup>ʔe<sup>5</sup>-\*ʔi<sup>4</sup>ne<sup>1</sup>/ (old.woman-\*entire.body) → [no<sup>31</sup>ʔe<sup>5</sup>ʔi<sup>4</sup>ne<sup>1</sup>] 'entire body of old woman'
  - /ka<sup>3</sup>ru<sup>1</sup>-\*ne<sup>3</sup>-\*ʔi<sup>4</sup>ne<sup>1</sup>/ (Carlos-\*son-\*entire.body) → [ka<sup>3</sup>ru<sup>1</sup>ne<sup>3</sup>ʔi<sup>4</sup>ne<sup>1</sup>] 'Carlos' son's entire body'

Tone dissimilation is an exclusively tonal process, but has the same distribution in the word as assimilation of /i/. When an affix, clitic, or inalienably possessed noun beginning with tone 1 or tone 1̣ follows a monosyllabic noun or pronoun with tone 1̣, the tone 1̣ of the base dissimilates to tone 5 (24). But when the base is disyllabic or larger, dissimilation fails to occur (25).

- (24) Dissimilation of 1̣-1̣ and 1̣-1 sequences: Occurs with monosyllabic base (GE.ABS.20160804)
- /kḁ<sup>1</sup>-\*ḁ<sup>1</sup>tḱ<sup>3</sup>/ (fruit.sp-\*yard) → [ka<sup>5</sup>ḁ<sup>1</sup>tḱ<sup>3</sup>] 'patio planted with kḁ<sup>1</sup> fruit trees'
  - /to<sup>1</sup>-\*a<sup>1</sup>ne<sup>1</sup>/ (Night.Monkey-\*garden) → [to<sup>5</sup>o<sup>1</sup>ne<sup>1</sup>] 'Night Monkey's garden'
- (25) Dissimilation of 1̣-1 and 1̣-1 sequences: Fails to occur in disyllabic and larger bases (GE.ABS.20160804)
- /ko<sup>2</sup>re<sup>1</sup>-\*a<sup>1</sup>ne<sup>1</sup>/ (sweet.potato-\*garden) → [ko<sup>2</sup>re<sup>1</sup>a<sup>1</sup>ne<sup>1</sup>] 'sweet potato garden'
  - /tʃau<sup>1</sup>-\*ʔma<sup>1</sup>-\*a<sup>1</sup>ne<sup>1</sup>/ (1SG-\*wife-\*garden) → [tʃo<sup>1</sup>ʔma<sup>1</sup>a<sup>1</sup>ne<sup>1</sup>] 'my wife's garden'
  - /tʃau<sup>1</sup>-\*e<sup>3</sup>ja<sup>1</sup>-\*a<sup>1</sup>ne<sup>1</sup>/ (1SG-\*sister-\*garden) → [tʃau<sup>1</sup>e<sup>3</sup>ja<sup>1</sup>a<sup>1</sup>ne<sup>1</sup>] 'my sister's garden'

Without stress, the environment of /i/-assimilation and tone dissimilation is defined as the first two syllables of the Prosodic Word. With stress, their environment is defined as the first foot of the Prosodic Word. While either description is empirically correct, the foot analysis defines the environment as a constituent of the Prosodic Hierarchy and allows modeling of the processes with cross-linguistically motivated positional markedness and faithfulness constraints (Beckman 1997).

The second argument in favor of the foot analysis is phonotactic. Recall from §4.5 that a large number of segments and tones -- /k<sup>w</sup>/, /d/, /ɲ/, /ŋ/, /au/, /ai/, and the contour tones -- are

limited, in native vocabulary words, to the first syllable of verb roots, alienably possessed nouns, and adverbs. They cannot appear later in the word in words of these classes, nor are they permitted in inalienably possessed nouns, affixes, or clitics. On the stress analysis, this can be viewed as another positional faithfulness phenomenon: these morphs are permitted only in the head syllable of the Prosodic Word.

Converging evidence that a head foot -- not just a head syllable -- is necessary comes from the distribution of /o/. /o/ has slightly greater freedom than the other phonotactically restricted segments in that it can appear in both the first and the second syllable of verb roots, alienably possessed nouns, and adverbs, but it cannot appear beyond the second syllable. On the stress analysis, this restriction can be formalized with the statement that /o/ is permitted only in the head foot of the Prosodic Word.

Finally, fast speech reduction processes also lend support to the stress analysis. Running speech in CT displays many forms of reduction affecting the noninitial syllables of polysyllabic words. These forms of reduction range from regressive vowel quality assimilation, as in *tʃau<sup>1</sup>ja<sup>5e3</sup>* 'my hair' → [tʃau<sup>1</sup>je<sup>5e3</sup>], to loss of onsets, to apocope of segments, to complete apocope, as in *ma<sup>3</sup>ri<sup>3</sup>* 'now' → [ma<sup>3</sup>]. None of these processes ever affect the initial syllable of the Prosodic Word, even when that syllable meets the environment for the process. For example, the verb root *ta<sup>5e3</sup>* 'buy, sell' and the antipassive suffix *-ta<sup>2e3</sup>* are segmentally identical. Yet the antipassive is subject to regressive vowel quality assimilation in running speech, yielding [-te<sup>2e3</sup>], while the verb root never is. This phenomenon can be understood as positional faithfulness, a counterpart to the positional markedness observed in the /i/ assimilation and tone dissimilation processes.

### 5.3 The Prosodic Word and the morphological word

The stress domain is coextensive with the morphological word in nouns, adverbs, interjections, and particles. In the verb complex, on the other hand, a single morphological word can contain multiple stress domains. A minimally inflected verb contains two stress domains, with no evidence that either stress is secondary to the other. Verbs which have undergone incorporation of alienably possessed nouns can contain as many as four stress domains.

To understand the prosodic constituency of the verb complex, it is first necessary to understand its morphological constituency. (26) gives a simplified morphological template for the CT verb complex. In this section, I argue in §5.3.1 and §5.3.2 that slots -3, -2, and -1 -- the proclitics -- form one stress domain, and slots 0 through 6 -- the verb root with its affixes, incorporates, and clitics -- form another. Lexical phonology, phonotactics, and fast speech processes converge to support this hypothesis. I will then argue that in verbs which have incorporated an alienably possessed noun, there is at least one additional stress domain between slots 2 and 3 (§5.3.3).

#### (26) Simplified verb template

-3	-2	-1	0		
Pre-Proclitic = Subject Proclitic = Object Proclitic = <b>Root</b>					
0	1	2	3	4	5
<b>Root</b> -Directionals -Incorporates -Valence -Other Verbal Affixes = Enclitics					
6					
= Subordinators					

Example morphs by slot	
Slot Name & Number	Example Morphs
-3 Pre-Proclitic	$i^5 = \text{DIR}$ , $i^2 = \text{DIR}$ , $i^5 = \text{IMPF}$ , $i^5 = 3.\text{NonI.OBJ.MC.A}$
-2 Subject Proclitic	$na^4 = 3.\text{NonI.SBJ.MC.A}$ , $ni^{41} = 3.\text{NonI.SBJ.MC.I}$ , $na^4ri^3 = 3.\text{NonI.SBJ.MC.RI}$
-1 Object Proclitic/Associated Motion	$na^3 = 3.\text{NonI.OBJ.MC.A}$ , $ja^1 = 3.\text{NonI.OBJ.MC.I}$ , $ja^1 = \text{AM:go/come.and}$
0 Root	
+ 1 Directional Affixes	$-na^4gi^4 \text{ DIR:up}$ , $-e^1gu^1 \text{ DIR:circular}$
+ 2 Incorporates	up to 2 inalienably possessed nouns and/or noun classifiers; or $-a^1ri^3 \text{ PR.POSS}$
+ 3 Valence Affixes	$-ʔe^4ʔe^3 \text{ CAUS}$ , $-ta^2e^3 \text{ ANTIPAS}$
+ 4 Other Verbal Affixes	$-e^3 \text{ PL}$ , $-ta^1 \text{ ASP:expert}$
+ 5 Enclitics	$= gi^4 \text{ PL}$ , $= tʃi^1gi^1 \text{ DISTRIB}$
+ 6 Subordinate Morphology	$= ʔgu^2 \text{ SIMUL}$ , $= q^1ʔi^4 \text{ 3.NonI.SBJ} > \text{3.NonI.OBJ.SC}$ , $= ʔi^4 \text{ NMLZ:IV}$

### 5.3.1 Minimally inflected verbs

This section discusses the prosodic constituency of verbs which bear subject and object proclitics, but do not have pre-proclitics or incorporated alienably possessed nouns. I refer to such verbs mnemonically as 'minimally inflected verbs.'

I begin with lexical phonological evidence for the constituency of minimally inflected verbs. Recall from §5.2 that in nouns, assimilation of noncentral vowel-/i/ sequences is limited to the first two syllables of the word. In minimally inflected verbs, the syllable count for this process begins at the left edge of the verb root. Regardless of the number of syllables in the subject-object proclitic string, assimilation applies between a monosyllabic verb root with a final non-central vowel and a /i/-initial affix, incorporate, or clitic (27). Assimilation fails to apply to noncentral-central vowel sequences which occur later in the verb stem, whether between a disyllabic or trisyllabic verb root and a following element (28) or between two elements which are not verb roots (29). Additionally, /i/ assimilation fails to occur between /i/-final subject proclitics and /i/-initial verbs (30).

- (27) Assimilation of noncentral-central vowel sequences: Occurs between (C)V verb root and following element
- Verb has 1σ subject proclitic string:  
/na<sup>4</sup> = me<sup>43</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.good.A = DEINTENS) → [na<sup>4</sup>me<sup>31</sup>ʔe<sup>1</sup>ra<sup>1</sup>] 'it's sort of good' (GE.DGG.20160803)
  - Verb has 2σ subject proclitic string:  
/na<sup>4</sup>ri<sup>3</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.RI = stay.RI = DEINTENS) → [na<sup>4</sup>ri<sup>3</sup>ʔa<sup>5</sup>ʔi<sup>1</sup>ra<sup>1</sup>] 's/he sort of stays' (GE.MFC.20160727)
  - Verb has 2σ subject-object proclitic string:  
/tʃa<sup>3</sup> = na<sup>3</sup> = wi<sup>51</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (1SG.SBJ.MC.A = 3.NonI.OBJ.MC.A = cut.with.knife.A = DEINTENS)  
→ [tʃa<sup>3</sup>na<sup>3</sup>wi<sup>51</sup>ʔi<sup>1</sup>ra<sup>1</sup>] 'I sort of cut it with a knife' (GE.DGG.20160803)
- (28) Assimilation of noncentral-central vowel sequences: Fails to occur between nonmonosyllabic verb root and following element

- a. /na<sup>4</sup> = tʃi<sup>43</sup>e<sup>2</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.bad.A-DEINTENS) → [na<sup>4</sup>tʃi<sup>43</sup>e<sup>2</sup>ʔi<sup>1</sup>ra<sup>1</sup>] 'it's sort of bad' (GE.MFC.20160727)
- b. /na<sup>4</sup> = nũ<sup>5</sup>ke<sup>1</sup>-\*ʔi<sup>4</sup>ne<sup>1</sup>/ (3.NonI.SBJ.MC.A = wrap.A-\*NI:entire.body) → [na<sup>4</sup>nũ<sup>5</sup>ke<sup>1</sup>ʔi<sup>4</sup>ne<sup>1</sup>] 's/he wraps his/her body' (GE.DGG.20160730)
- (29) Assimilation of noncentral-central vowel sequences: Fails to occur between non-root elements of verb
- a. /na<sup>4</sup> = tʃo<sup>1</sup>-\*e<sup>2</sup>ru<sup>4</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.white.A-\*NI:head = DEINTENS) → [na<sup>4</sup>tʃo<sup>1</sup>e<sup>2</sup>ru<sup>4</sup>ʔi<sup>1</sup>ra<sup>1</sup>] 'its head is sort of white' (GE.MFC.20160727)
- b. /na<sup>4</sup> = nũ<sup>3</sup> = ã<sup>4</sup>tʃi<sup>4</sup>-\*ʔi<sup>4</sup>ne<sup>1</sup>/ (3.NonI.SBJ.MC.A = flex-\*NI:entire.body) → [na<sup>4</sup>nũ<sup>3</sup>a<sup>4</sup>tʃi<sup>4</sup>ʔi<sup>4</sup>ne<sup>1</sup>] 's/he flexes a muscle' (GE.DGG.20160803)
- (30) Assimilation of noncentral-central vowel sequences: Fails to occur between subject proclitic and verb root (GE.ABS.20160804)
- a. /tʃi<sup>3</sup> = i<sup>43</sup>-ku<sup>2</sup>/ (1SG.SBJ.MC.I = walk.A-DIR:inward.A>I) → [tʃi<sup>3</sup>ʔi<sup>43</sup>ku<sup>2</sup>] 'I enter'
- b. /tʃi<sup>3</sup> = i<sup>43</sup>-e<sup>3</sup>/ (1SG.SBJ.MC.I = walk.A-DIR:across.A>I) → [tʃi<sup>3</sup>ʔi<sup>31</sup>e<sup>3</sup>] 'I walk across (stream, path, street)'

The same generalizations hold for tone dissimilation, the other process which is limited to the first two syllables of the morphological word in nouns. That is, dissimilation applies between a monosyllabic tone 1 verb root and a following tone 1 or 1-initial element regardless of the number of syllables in the verb's subject and object proclitic string (31). It fails to apply later in the verb stem (32).

- (31) Dissimilation of /1-1/ and /1-1/: Occurs between 1 verb root and following element
- a. Verb has 1σ subject proclitic string:  
/ni<sup>43</sup> = tʃo<sup>1</sup> = tʃi<sup>1</sup>gi<sup>1</sup>/ (3.NonI.SBJ.MC.I = be.white.A = DISTRIB.A>I) → [ni<sup>43</sup>tʃo<sup>5</sup>tʃi<sup>1</sup>gi<sup>1</sup>] 'it's getting whiter and whiter' (GE.LWG.20160801)
- b. Verb has 1σ subject proclitic string:  
/na<sup>4</sup> = tʃo<sup>1</sup>-a<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.white.A-\*NI:mouth) → [na<sup>4</sup>tʃo<sup>5</sup>o<sup>1</sup>] 'its mouth is white' (GE.DGG.20160806)
- c. Verb has 2σ subject proclitic string:  
/na<sup>4</sup>ri<sup>3</sup> = ãũ<sup>1</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.RI = stay.RI = DEINTENS) → [na<sup>4</sup>ri<sup>3</sup>ʔãũ<sup>5</sup>ʔi<sup>1</sup>ra<sup>1</sup>] 's/he sort of stays' (GE.MFC.20160727)
- d. Verb has 2σ subject-object proclitic string:  
/tʃa<sup>3</sup> = na<sup>3</sup> = ku<sup>1</sup>-e<sup>1</sup>gu<sup>1</sup>/ (1SG.SBJ.MC.A = 3.NonI.OBJ.MC.A = push-DIR:circle) → [tʃa<sup>3</sup>na<sup>3</sup>ku<sup>5</sup>e<sup>1</sup>gu<sup>1</sup>] 'I push it in a circle' (GE.LWG.20160801)
- (32) Dissimilation of /1-1/ and /1-1/: Fails to occur between non-root elements of verb (GE.DGG.20160806)
- a. /ni<sup>41</sup> = tʃo<sup>1</sup>-\*a<sup>1</sup> = tʃi<sup>1</sup>gi<sup>1</sup>/ (3.NonI.SBJ.MC.I = be.white.A-\*NI:mouth = DISTRIB.A>I) → [ni<sup>41</sup>tʃo<sup>5</sup>o<sup>1</sup>tʃi<sup>1</sup>gi<sup>1</sup>] 'its mouth is getting whiter and whiter'
- b. /ni<sup>41</sup> = pa<sup>1</sup>-\*a<sup>1</sup> = tʃi<sup>1</sup>gi<sup>1</sup>/ (3.NonI.SBJ.MC.I = smell.bad.I-\*NI:mouth = DISTRIB.A>I) → [ni<sup>41</sup>pa<sup>1</sup>a<sup>1</sup>tʃi<sup>1</sup>gi<sup>1</sup>] 'its mouth is smelling worse and worse'

If one assumes that a verb and its subject and object proclitics form a single prosodic constituent, then the application of /i/ assimilation and tone dissimilation must be viewed as morphologically conditioned. On this analysis, they are limited to the first foot of the word in nouns, but the first

foot of the verb stem in verbs. On the other hand, if the verb stem forms a separate stress domain from the subject and object proclitics, then the environments of these processes are the same in both word classes: they occur within a foot.

A second form of evidence for the subject-object proclitic string and the verb stem as separate stress domains comes from the phonotactics of subject proclitics and verb roots. Both the first syllable of a subject proclitic and the first syllable of a verb root are phonotactically privileged positions. All of the segments and tones which are banned in the non-first syllables of nouns are permitted in the first syllable of verb roots. Similarly, the first syllable of a subject proclitics can display one of the banned segments, /ŋ/, and three of the four banned contour tones.

The distribution of phonotactically marked phones, like the distribution of /i/ assimilation and tone dissimilation, presents a choice between two possible analyses: one that makes phonotactics contingent on word class, and one that makes prosodic constituency contingent on word class but treats the phonotactics as general. Here, if one assumes that the verbal complex is a single prosodic domain, this distribution of phones makes it necessary to formulate different, morphologically specific statements of phonotactics for each word class. But if the proclitic string is one stress domain and the verb stem is another, then the same phonotactic restrictions hold of all word classes.

Reduction processes also support this analysis, and show specifically that the subject and object proclitics form a stress foot. Recall from §5.2 that unstressed syllables, especially word-final unstressed syllables, tend to be reduced -- losing their onsets, losing all segmental content, or being totally deleted -- in running speech. The I-class third person object proclitic is also subject to this process. Although this proclitic has the underlying form  $ja^1=$ , in running speech it is often realized as onsetless  $[a^1]$ . Following a tone 3 or 4 subject proclitic, it can also be realized simply by associating a 1 tone with the subject proclitic, yielding a 31 or 41 contour on the proclitic. Thus, the subject-object proclitic sequence  $tja^3=ja^1$  1SG>3.NonI.OBJ.MC.I-3.NonI.OBJ.MC.I can be realized as  $[tja^3a^1]$  or  $[tja^{31}]$ . This is analogous to the reduction of the word-final syllable in disyllabic nouns and adverbs, suggesting that the subject-object proclitic string forms a disyllabic Prosodic Word. The phonotactics of the (small number of) elements which can occur in the Object Proclitic slot are consistent with this analysis.

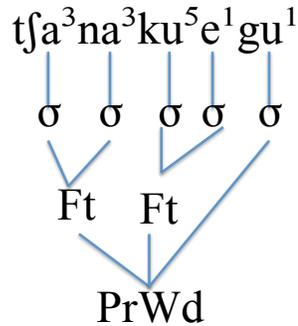
(33) graphically represents the proposed analysis of the prosodic constituency of a minimally inflected verb. I follow Ito & Mester (1999) in assuming that syllables which are not parsed into feet may be adjoined to feet to form a Prosodic Word.

(33) Prosodic constituency of an example verb

Item:  $tja^3na^3ku^5e^1gu^1$

$tja^3=$                        $na^3=$                        $ku^1$   $-e^1gu^1$   
 1SG.SBJ.MC.A = 3.NonI.OBJ.MC.A = push -DIR:circular

'I push it in a circle' (GE.LWG.20160801)



(34) summarizes the proposed analysis of the prosodic constituency of minimally inflected verbs as a series of rules. (35) gives a set of OT constraints and constraint ranking which formalizes the analysis. In these analyses, I assume that the verb root and its proclitics form a single PrWd, even though they are separate stress domains, because the two constituents interact phonologically in hiatus resolution (§6.4).

(34) Stress rules for nouns and minimally inflected verbs

- a. All feet are trochees (left-headed).
- b. The ideal foot contains exactly two syllables, but monosyllabic feet are permitted.
- c. The position of stress is partially determined by morphology. In a morphological word that is not a verb, there is exactly one foot, and its left edge is aligned with the left edge of the word. In an inflected verb, there is one foot left-aligned with the initial syllable of the subject proclitic and another left-aligned with the verb root.

(35) OT constraints for stress on nouns and minimally inflected verbs

- a. FTTYPE = TROCHEE: Assign one violation for every foot where the first syllable is not stressed in the output.
- b. FTBIN: Assign one violation for every foot that fails to contain exactly two syllables in the output.
- c. PARSESYLL: Assign one violation for every syllable that is not footed in the output.
- d. ALL-FT-L: Assign one violation for every foot in the output such that the left edge of the foot does not coincide with the left edge of the PrWd.
- e. ALIGN(L,FT,L,ROOT): In a PrWd that includes a root, assign one violation if, in the output, the left edge of the leftmost root does not coincide with the left edge of a foot.
- f. ALIGN(L,FT,L,SBJPROCLITIC): In a PrWd that includes a subject proclitic, assign one violation if, in the output, the left edge of the subject proclitic does not coincide with the left edge of a foot.

Ranking: ALIGN(L,FT,L,SBJPROCLITIC), ALIGN(L,FT,L,ROOT) > ALL-FT-L > FTTYPE = TROCHEE > PARSESYLL > FTBIN

### 5.3.2 Verbs with pre-proclitics

The verbal complex displays one proclitic slot to the left of the subject proclitic. I refer to this slot as the pre-proclitic slot and the morphs which occupy it as pre-proclitics. There are just four pre-proclitics, all of which -- presumably for diachronic reasons -- have the segmental form [i].

The four productive pre-proclitics are the imperfective aspect marker  $i^5=$ ; the directionals  $i^5=$  and  $i^2=$ , which are part of the (multiple) exponence of several different directional constructions; and the third person object pre-proclitic  $i^5=$ , which appears in verbs which have an associated motion morph in the object proclitic slot. There is no evidence that multiple pre-proclitics can co-occur, although I lack negative data on this point.

In a verb that bears a pre-proclitic, the subject proclitic is the second rather than the first element of the morphological word. Nevertheless, the subject proclitic displays all of the same prosodic properties as if there were no pre-proclitic: it can have a contour tone, it can include /ŋ/, it resists reduction (while the object proclitic can be reduced), and so on. For the stress analysis, this indicates that the subject proclitic is stressed even it is not the first element of the proclitic group. The analysis of minimally inflected verbs in (34) and (35) handles this by making the rules and constraints for stress in the proclitic group morphologically sensitive. Specifically, in the OT grammar, the definition of ALIGN(L,FT,L,SBJPROCLITIC) specifically requires that the subject proclitic be aligned with the left edge of a foot. Because this constraint outranks ALL-FT-L and PARSESYLL, the grammar will construct a foot aligned with the left edge of the subject proclitic even if it does not align with the left edge of the PrWd. The tableau in (36) illustrates.

(36) Stress on subject proclitic preceded by pre-proclitic

Item:  $i^5ni^{43}\tilde{u}^{43}$

$i^5=$                        $ni^{43}=$                        $\tilde{u}^{43}$   
 DIR:homeward = 3.NonI.SBJ.MC.I = come/go.SGACT

'he goes home' (GE.DGG.20160730)

	$i^5 = ni^{43} = \tilde{u}^{43}$	ALIGN(L,FT,L,SBJPROCLITIC)	ALL-FT-L	PARSESYLL
a.	$(i^5 = ni^{43}) = (\tilde{u}^{43})$	*!	*	
b.	$i^5 = (ni^{43}) = (\tilde{u}^{43})$		**	*
c.	$(i^5) = (ni^{43}) = (\tilde{u}^{43})$		***!	

### 5.3.3 Verbs with incorporated alienably possessed nouns

CT displays a cross-linguistically remarkable degree of noun incorporation. Noun incorporation applies to nouns which are possessed by another noun. It is possible for the subjects of intransitives and the patients of transitives. Within these categories, whether incorporation actually occurs in discourse conditioned primarily by information structure -- specifically by a preference for the most information-structurally prominent noun in the clause to be an argument (not the possessor of an argument). Beyond these conditions, however, there are no morphological or semantic restrictions on which nouns can be incorporated. It is possible to incorporate not only inalienably possessed nouns, but also alienably possessed nouns, including deverbal nominalizations, complex noun phrases, nonce borrowings from Spanish, and so on.

When a verb incorporates an alienable noun phrase, three morphological processes occur. First, the Incorporate slot of the verbal template is filled by the affix  $-a^1ri^3$ . Second, the token of  $-a^1ri^3$  is followed by the incorporated noun phrase. And third, the incorporated noun phrase is followed

by the enclitic =  $\tilde{a}^1$ . (37) illustrates the construction. In (37a), the incorporated constituent is the single alienably possessed noun  $tfo^{43}\gamma ni^5$  'fish'; in (37b), it is the complex noun phrase  $gu^5\tilde{r}^4 ma^3 i^5 tfo^{43}\gamma ni^5$  'all (the) fish.'

(37) Incorporation of alienably possessed nouns

a.  $ni^{31} ma^4 ri^1 na^4 gu^5 a^1 ri^3 tfo^{43} \gamma ni^5 \tilde{a}^1$ .

$ni^{31} ma^4 ri^1 na^4 =$   $gu^1 -a^1 ri^3 tfo^{43} \gamma ni^5 = \tilde{a}^1$   
 3.PRO TOP 3.NonI.SBJ.MC.A = run.out -PR.POSS fish = PR.POSS  
 'He ran out of fish' ~ 'His fish ran out.' (GE.LWG.20160806)

b.  $ni^{31} ma^4 ri^1 na^4 gu^5 a^1 ri^3 gu^5 \tilde{r}^4 ma^3 i^4 tfo^{43} \gamma ni^5 \tilde{a}^1$ .

$ni^{31} ma^4 ri^1 na^4 =$   $gu^1 -a^1 ri^3 gu^5 \tilde{r}^4 ma^3 i^4 tfo^{43} \gamma ni^5$   
 3.PRO TOP 3.NonI.SBJ.MC.A = run.out -PR.POSS all.IV NCL:IV fish  
 =  $\tilde{a}^1$   
 = PR.POSS

'He ran all out of fish' ~ 'All his fish ran out.' (GE.LWG.20160806)

Verbs which have undergone incorporation of an alienably possessed noun remain a single morphological word. For example, such verbs can undergo all forms of nominalization, adverbialization, and (non-nominalizing) subordination, with the word-class-changing or subordinating morphology appearing after the =  $\tilde{a}^1$  enclitic. Since nominalization and subordination are processes that otherwise apply only to verbs, this suggests that the string consisting of a verb root, its incorporated alienably possessed nouns, and =  $\tilde{a}^1$  is morphologically a verb stem. (38) provides an example of a verb which has undergone both alienable noun incorporation and nominalization.

(38) Verbs which have undergone incorporation of alienably possessed nouns are verbs: nominalization test

$na^{4?} na^1 \tilde{r}^3 we^5 \tilde{r}^4, na^1 \tilde{r}^3 \tilde{e}^1 mi^3 \tilde{r}^4, na^1 \tilde{r}^2 a^1 ri^3 tju^2 tji^4 \tilde{a}^5 \tilde{r}^4$

$na^{4?} na^1 =$   $i^{31} *we^5 \tilde{r}^3 = \tilde{r}^4 na^1 =$   $i^{31} *e^1 mi^3$   
 COMP 3.NonI.SBJ.SC.A = make -\*NI:canoe = NMLZ:IV 3.NonI.SBJ.SC.A = make -\*NI:oar  
 =  $\tilde{r}^4 na^1 =$   $i^2 -a^1 ri^3 tju^2 tji^4 = \tilde{a}^1 = \tilde{r}^4$   
 = NMLZ:IV 3.NonI.SBJ.SC.A = make -PR.POSS arrow = PR.POSS = NMLZ:IV

'(It is good) that he make his own canoes, that he make his own oars, that he make his own arrows (and not borrow his father-in-law's)' (complement of ellipted modal verb) (DGG, ntk 2:01)

The morphological category of verbs with incorporated alienable nouns is relevant here because the nouns that appear in the midst of such verbs are prosodically independent words. For example, the noun phrase that is incorporated into the verb in (37b),  $gu^5 \tilde{r}^4 ma^3 i^5 tfo^{43} \gamma ni^5$  'all the fish,' is a noun phrase consisting of a quantifier (derived from a verb), noun class particle, and head noun. Prosodically, all elements of this noun phrase behave in isolation as independent words which constitute their own stress domain. Syntactically, the quantifier and noun are also acceptable in isolation as arguments. While the syntactic behavior of alienable nouns changes when they are incorporated -- they can no longer be case-marked -- there are no changes to their prosody. For example, the contour tone and the /o/ in the first syllable of  $tfo^{43} \gamma ni^5$  'fish' survive under incorporation in (37a,b). This indicates that  $tfo^{43} \gamma ni^5$  continues to constitute its own stress domain

when incorporated, even though it has become morphologically a part of the verbal complex. While preservation of contour tones and banned segments constitutes my only data for this point, I hypothesize that elements of incorporated alienably possessed noun phrases maintain *all* of their prosodic structure under incorporation.

Since it is possible to incorporate alienably possessed nouns and noun phrases without altering their prosody, any theory of the relationship between morphology and stress in CT must recognize the possibility that the verb complex -- though a single morphological word -- can properly include multiple stress domains. On the analysis suggested above, for example, the verb stem in (37a) has the structure  $[[\text{gu}^5\text{a}^1\text{ri}^3]_{PrWd} [\text{tʃo}^{43}\text{ni}^5\tilde{\text{a}}^1]_{PrWd}]_{MWd}$ , and the stem in (37b),  $[[\text{gu}^5\text{a}^1\text{ri}^3]_{PrWd} [\text{gu}^5\tilde{\text{r}}^4\text{ma}^3]_{PrWd} [\text{i}^4]_{PrWd} [\text{tʃo}^{43}\text{ni}^5\tilde{\text{a}}^1]_{PrWd}]_{MWd}$ . This analysis converges with my analysis of proclitics in treating the verb complex as composed of multiple stress domains, although incorporated alienable nouns do not have precisely the same syntactic or prosodic status as proclitic groups.

This analysis of the prosodic constituency of verbs with alienable noun incorporation makes several concrete predictions. It predicts that all constituents of an incorporated alienably possessed noun phrase are phonologically parsed as independent words, and therefore exhibit exactly the same metrically conditioned phonology when incorporated as when free. It also suggests that it will be licit to pause between elements of an incorporated alienable noun phrase; that errors in producing incorporated noun phrases will pattern like errors in producing free noun phrases, rather than like errors in producing verb stems; and that speakers, modulo their knowledge of orthographic conventions, will consider it appropriate to write the components of an incorporated alienable noun phrase as separate orthographic words.

## 6 Phonological processes

CT displays many productive phonological processes, especially ones affecting vowel quality and laryngeal features. In this section, I divide phonological processes into lexical phonological processes and postlexical phonological processes based on the criteria in Kiparsky (1982). I further divide lexical phonological processes into general processes and morphologically conditioned phonology. Because the postlexical phonology of CT is much simpler than the lexical phonology, I describe it first (§6.1). I then describe general processes of lexical phonology (§6.2), followed by morphologically conditioned phonology (§6.3). The phonology of glottal stop in CT is subject to a set of intersecting tonal, segmental, and morphological conditions. §6.4 is therefore dedicated exclusively to phenomena involving glottal stop. Glottal stop is not discussed in the preceding sections.

### 6.1 Postlexical phonology

I have identified six postlexical phonological processes in CT. These are /j/-lenition, glide formation, /i/-fronting, /u/-lowering, laryngealization spreading, and nasal spreading. Under the criteria for distinguishing lexical from postlexical phonology in Kiparsky (1982) and other statements of Lexical Phonology and Morphology, these processes qualify as postlexical for four reasons. They have no morphological or lexical conditioning; they are optional; they are found more often in fast speech than in careful speech; and, in a stratal theory, they must be ordered after

lexical phonological processes. An additional property of the postlexical processes here is that all of them are either anticipatory (the environment follows the focus) or multiply triggered (the environment refers to phones on both sides of the focus). None are exclusively perseverative.

### 6.1.1 /j/-lenition

/j/ spirantizes and fronts to [ʒ] when it appears preceding front vowels (39a, b). When /j/ precedes a central or back vowel, spirantization does not occur. Instead, /j/ is realized as the glide [j] (40). Because there are no /j/-final morphs, there are no alternations demonstrating /j/-lenition and no data on whether it occurs across word boundaries.

- (39) /j/-spirantization: /j/ → [ʒ] / \_V[+front]  
 a. *\_i*: /ji<sup>2</sup>ma<sup>4</sup>/ → [ʒi<sup>2</sup>ma<sup>4</sup>] 'DNOM.ANA:II'  
 b. *\_e*: /je<sup>4</sup>ma<sup>4</sup>/ → [ʒe<sup>4</sup>ma<sup>4</sup>] 'DNOM.ANA:IV'
- (40) /j/-gliding: /j/ → [j] / \_V[-front]  
 a. *\_a*: /ja<sup>4</sup>/ → [ja<sup>4</sup>] 'NCL:II' (DGG, ntk 0:22)

/j/-spirantization may be motivated in part by paradigmatic contrasts. The contrast between word-initial /je/ or /ji/ and /ŋe/ bears a high functional load in the paradigms of anaphoric deictics, where it distinguishes the Class I-III nonpast anaphors from their Class IV counterpart, as well as the Class IV nonpast anaphor from its past tense equivalent (§9.1.1). Spirantization of /j/ may serve to enhance the /je/-/ŋe/ and /ji/-/ŋe/ contrasts, since [j] and [ŋ] are more auditorily similar than [ʒ] and [ŋ] (as [ʒ] is strident and [j] and [ŋ] are not). Perhaps related, there is a strong phonotactic tendency for underlying /ji/ and /je/ sequences to be initial in the word. All of the /ji/ sequences in my lexicon, and all but three of the /je/ sequences, are in the first syllable of the Prosodic Word. None of my tokens of words with non-word-initial /je/ display /j/-spirantization, suggesting that position in the word may also condition this process.

Although /j/-spirantization could in principle interact with the postlexical process of /i/-fronting, I have no data on whether it actually does.

### 6.1.2 Glide formation

When a diphthong /ai/ or /au/ is immediately followed by another vowel, the second member of the diphthong can glide to a semivowel [j] or [w], ceasing to have stable vowel formants on the spectrogram. (41a-d) show this process applying between the tone 1 diphthong of the 1SG inalienable possession pronoun *tʃau<sup>1</sup>* and vowels with tones 1, 2, 3, and 5. Although glide formation is possible with any combination of tones on the diphthong and the vowel, impressionistically it occurs more often when the diphthong and the vowel following the diphthong have the same tone or differ in tone by only one level than when they differ by a larger number of tone levels.

- (41) Glide formation: /auV/ → /awV/  
 a. *au<sup>1</sup> + V<sup>1</sup>*: /tʃau<sup>1</sup>-\*ĩ<sup>1</sup>ta<sup>1</sup>/ (1SG-\*body.space) → [tʃa<sup>1</sup>wĩ<sup>1</sup>ta<sup>1</sup>] 'the space around my body; the space where I live'  
 b. *au<sup>1</sup> + V<sup>2</sup>*: /tʃau<sup>1</sup>-\*e<sup>2</sup>ru<sup>4</sup>/ (1SG-\*head) → [tʃa<sup>1</sup>we<sup>2</sup>ru<sup>4</sup>] 'my head'



- a. In  $nu^5a^2$ :  $/nu^5a^2/ \rightarrow [no^5a^2]$  'DLOC.PROX' (ECG, bti 5:22)
- b. In a morphologically complex word:  
 $na^1\tilde{?}o^3a^1ne^3\tilde{?}i^4$   
 $na^1 = \quad \quad \quad \tilde{?}i^4 \quad *a^1ne^1 = \tilde{?}i^4$   
 3.NonI.SBJ.SC.A = walk -\*NI:land = NMLZ:IV  
 '(it is difficult) for one to walk around' (LCS, lkn 2:28)

/u/-lowering counterfeeds the lexical phonological rule of assimilation of /a/ to /o/, as predicted by the ordering component of Lexical Phonology. If /u/-lowering occurs outside the first foot of the Prosodic Word, then it may also counterfeed the ban on /o/ outside of this foot. I lack data, however, on whether /u/-lowering can apply to tokens of /u/ that are not in the first syllable.

### 6.1.5 Laryngealization spreading

Phonetic laryngealization can spread bidirectionally from a tone 1 syllable to neighboring modal syllables, provided that the trigger (tone 1) syllable is adjacent to the vowel of the target syllable (44a); separated from the target only by a sonorant (44b); or separated from the target only by a glottal stop (44c). There is no laryngealization spreading when the trigger and potential target are separated by both a sonorant and a glottal stop (44d). Note that, even though laryngealization occurs underlyingly only on tone 1 syllables, it can spread to syllables of higher tone (44c). My limited data on this process in multisyllabic words suggests that it is not iterative.

- (44) Laryngealization spreading:  $V \rightarrow \underline{V} / \_C[+son]V^1, V^1C[+son]\_, \underline{V}^1(?)\_, \_ (?)V^1$
- a. Applies when trigger and target adjacent:  
 $/tjau^1-a^1/$  (1SG-mouth)  $\rightarrow [tj\underline{a}^1wa^1]$  'my mouth'
- b. Applies when trigger and target separated by sonorant:  
 $/ni^{41}-du^1ru^1/$  (3.NonI.SBJ-I-MC-tremble)  $\rightarrow [ni^{41}du^1\underline{r}u^1]$  'she/he/it trembles'
- c. Applies when trigger and target separated by glottal stop:  
 $/na^{43}-\tilde{?}a^1ti^3/$  (DEF.POSS-yard)  $\rightarrow [na^{31}\tilde{?}\underline{a}^1ti^3]$  'the yard'
- d. Fails to apply when trigger and target syllables separated by both sonorant and glottal stop:  
 $/tjau^1-\tilde{?}ma^1/$  (1SG-wife)  $\rightarrow [tjo^1\tilde{?}ma^1]$  'my wife'

Laryngealization spreading leads to a three-way contrast in surface laryngealization among syllables that are *not* underlyingly tone 1. This contrast obtains between (1) open syllables that are not subject to laryngealization spreading, (2) syllables that are closed by glottal stop but not subject to laryngealization spreading, and (3) syllables that are subject to laryngealization spreading. The contrast can be characterized acoustically as involving the duration of the spectral signatures of laryngealization, which are very low amplitude and longer time intervals between glottal pulses. Open syllables without laryngealization spreading do not display either of these spectral properties. In syllables that are closed by glottal stop but not subject to laryngealization spreading, the vowel begins to be (spectrally and auditorily) laryngealized at approximately the midpoint of its duration. The vowel declines in amplitude until reaching spectral zero or near-zero at the glottal stop. Vowels that are laryngealized due to laryngealization spreading, on the other hand, are spectrally and auditorily laryngealized for their entire duration and do not necessarily decline in

amplitude over the timecourse (unless the syllable is also closed by glottal stop). Non-tone 1 vowels subject to laryngealization spreading maintain a pitch that is auditorily higher than the pitch of tone 1 vowels. Underlyingly tone 1 vowels which have undergone laryngealization spreading, however, are (to me) auditorily indistinguishable from underlyingly tone 1 vowels.

Laryngealization spreading counterfeeds tone 1 dissimilation (§6.2.4), a lexical phonological process, and the nominalizer tone circle (§6.3.2), a morphologically conditioned phonological process, as predicted by the ordering component of Lexical Phonology.

### 6.1.6 Nasal spreading

Nasal spreading is regressive. It occurs when a nasal vowel follows an oral vowel, either adjacent or separated from the oral vowel only by glottal stop. The [nasal] feature of the nasal vowel spreads to the oral vowel, rendering it nasal, as in (45). I have no data on whether this process applies across word boundaries.

- (45) Nasal spreading:  $V \rightarrow \tilde{V} / \_ (?) \tilde{V}$
- a. /ti<sup>31</sup> = ʔi<sup>3</sup>/ (3.I.PRO = ACC) → [ti<sup>31</sup>ʔi<sup>3</sup>] 'him/her (Class I, accusative)' (DGG, wer 0:24)
  - b. /bu<sup>31</sup>-ʔã<sup>3</sup> = gi<sup>4</sup>/ (be.child-COLL? = PL) → [bũ<sup>31</sup>ʔã<sup>3</sup>gi<sup>4</sup>] 'children' (DGG, wer 1:00)

As (45) indicates, nasal spreading can create surface T $\tilde{V}$  and D $\tilde{V}$  syllables, even though these are banned in the lexicon (§4.4). This is in line with the ordering claims of Lexical Phonology. There are also other processes that involve spreading of nasality, such as the partial nasalization of oral vowels following nasal stops (§4.4) and nasal spreading due to vowel quality assimilation (§6.2). These processes are distinct from the process in (45) because they are (a) perservative and (b) lexical.

## 6.2 Lexical phonology

CT displays four major lexical phonological processes that are not also morphologically conditioned. All of these processes are also stress-conditioned. While I have mentioned two of the four processes before as evidence for foot structure (§5.2), here I describe them in their own right, rather than as evidence for feet. The processes are /b/-spirantization (§6.2.1), assimilation of sequences of a noncentral vowel followed by /i/ (§6.2.2), assimilation of /oa/ sequences (§6.2.3), and dissimilation of /11/ and /1̣1/ tone sequences (§6.2.4).

### 6.2.1 /b/-spirantization

/b/ has the allophone [v] when it appears word-internally preceding /i/. Only two words demonstrate the process, but in those words it is obligatory (46a, b). There are no alternations demonstrating /b/-spirantization because there are no consonant-final, and therefore no /b/-final, morphs. /b/-spirantization does not occur in stressed syllables preceding /i/, or in any position preceding /e/ (46c, d).

- (46) /b/-spirantization: /b/ → [v] / (C/V)\_i

- a. Applies *\_i* in unstressed syllable: /po<sup>31</sup>ʔbi<sup>5</sup>/ → [po<sup>31</sup>ʔvi<sup>5</sup>] 'Two-Toed Sloth' (GE.KSC.20150815)
- b. Applies *\_i* in unstressed syllable: /a<sup>3</sup>ra<sup>3</sup>bi<sup>3</sup>ri<sup>5</sup>/ → [a<sup>3</sup>ra<sup>3</sup>vi<sup>3</sup>ri<sup>5</sup>] 'fish species' (TG, ~ Tupinambá *araberi*) (GE.LCS.20150814)
- c. Fails to apply *\_i* in stressed syllable (first syllable of verb root): i<sup>5</sup>tfa<sup>3</sup>na<sup>3</sup>bi<sup>43</sup>ʔi<sup>2</sup>tʃi<sup>4</sup>  
 i<sup>5</sup> = tʃa<sup>3</sup> = na<sup>3</sup> = bi<sup>43</sup> -ʔi<sup>2</sup>tʃi<sup>4</sup>  
 DIR = 1SG.MC.A = 3.NonI.OBJ.MC.A sweep -DIR:out  
 'I sweep it' (GE.DGG.20150723)
- d. Fails to apply *\_e* in unstressed syllable: na<sup>4</sup>bai<sup>2</sup>be<sup>1</sup>  
 na<sup>4</sup> = bai<sup>2</sup>be<sup>1</sup>  
 3.NonI.SBJ.MC.A = flash.lightning  
 'There is lightning'

I have no data on the interaction of /b/-spirantization with postlexical /i/-fronting, although in principle they could interact in a /bi/-final word.

### 6.2.2 Assimilation of /i/

When the oral vowel /i/ occurs following a non-central vowel within a foot -- either adjacent to the non-central vowel or separated from it only by glottal stop -- the /i/ assimilates completely to the preceding non-central vowel in quality (47) and nasality (48). This process is exclusively segmental. It is not conditioned by the laryngeal features of the segments involved, and it does not affect them. (47) and (48) demonstrate the insensitivity to tone, and (49) demonstrates the insensitivity to voice quality (in the base; there are no morphs beginning with /i/ that can occur in this position). I exemplify this process with the clitic =ʔi<sup>1</sup>ra<sup>1</sup> 'sort of' (which also causes tone alternations on the last syllable of the stem) and the directional affix -ʔi<sup>4</sup>ʔi<sup>4</sup> 'back and forth,' but it applies to all morphs beginning with /i/.

(47) /i/ assimilation: /i/ → V<sub>α</sub> / [V<sub>α</sub>(ʔ)]<sub>F</sub>, where V<sub>α</sub> is [+ front] or [+ back]

- a. Triggered by /i/: /tʃa<sup>3</sup> = na<sup>3</sup> = wi<sup>51</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (1SG.SBJ.MC.A = 3.NonI.OBJ.MC.A = cut.with.knife = DEINTENS) → [tʃa<sup>3</sup>na<sup>3</sup>wi<sup>51</sup>ʔi<sup>1</sup>ra<sup>1</sup>] 'I sort of cut it with a knife' (DGG 2016 p 143)
- b. By /e/: /na<sup>4</sup> = me<sup>43</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.good = DEINTENS) → [na<sup>4</sup>me<sup>43</sup>ʔe<sup>1</sup>ra<sup>1</sup>] 'it's sort of good' (GE.DGG.20160803)
- c. By /u/: /na<sup>4</sup> = bu<sup>31</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.child = DEINTENS) → [na<sup>4</sup>bu<sup>31</sup>ʔu<sup>1</sup>ra<sup>1</sup>] 's/he's sort of a child' (GE.MFC.20160727)
- d. By /o/: /na<sup>4</sup> = do<sup>43</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.soft = DEINTENS) → [na<sup>4</sup>do<sup>31</sup>ʔo<sup>1</sup>ra<sup>1</sup>] 'it's sort of soft' (GE.DGG.20160803)
- e. By /ai/: /na<sup>4</sup> = tai<sup>2</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.hard = DEINTENS) → [na<sup>4</sup>ta<sup>2</sup>ʔi<sup>1</sup>ra<sup>1</sup>] 'it's sort of hard' (GE.MFC.20160802)
- f. By /au/: /na<sup>4</sup> = dau<sup>4</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.red = DEINTENS) → [na<sup>4</sup>da<sup>4</sup>ʔu<sup>1</sup>ra<sup>1</sup>] 'it's sort of red' (GE.DGG.20160803)
- g. Not triggered by /a/: /ni<sup>41</sup> = a<sup>1</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.thin = DEINTENS) → [ni<sup>41</sup>ʔa<sup>1</sup>ʔi<sup>1</sup>ra<sup>1</sup>] 's/he's sort of thin' (GE.MFC.20160727)
- h. Not triggered by /i/:  
 /na<sup>4</sup> = na<sup>3</sup> = i<sup>2</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = 3.NonI.OBJ.MC.A = make = DEINTENS) → [na<sup>4</sup>na<sup>3</sup>ʔi<sup>2</sup>ʔi<sup>1</sup>ra<sup>1</sup>] 's/he sort of makes it' (GE.MFC.20160802)

- (48) /i/ assimilation includes assimilation for [nasal]
- /ni<sup>41</sup> = ē<sup>1</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.I = wound.heal = DEINTENS) → [ni<sup>41</sup>ʔē<sup>1</sup>ʔē<sup>1</sup>ra<sup>1</sup>] 'it (a wound) sort of heals' (GE.MFC.20160802)
  - /na<sup>4</sup> = ja<sup>3</sup> = õ<sup>2</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ > 3.NonI.OBJ.MC.I = 3.NonI.OBJ.MC.I = believe = DEINTENS) → [na<sup>4</sup>ja<sup>3</sup>ʔõ<sup>2</sup>ʔõ<sup>1</sup>ra<sup>1</sup>] 's/he sort of believes it' (GE.MFC.20160802)
  - /na<sup>4</sup>ri<sup>3</sup> = ǣũ<sup>1</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.RI = stay = DEINTENS) → [na<sup>4</sup>ri<sup>3</sup>ʔǣ<sup>5</sup>ʔũ<sup>1</sup>ra<sup>1</sup>] 's/he sort of stays' (GE.MFC.20160727; 1 > 5 due to tone dissimilation)
- (49) /i/ assimilation is insensitive to voice quality
- /na<sup>4</sup> = ŋu<sup>1</sup>-ʔi<sup>4</sup>ʔi<sup>4</sup>/ (3.NonI.SBJ.MC.A = learn-DIR:back.and.forth) → [na<sup>4</sup>ŋu<sup>1</sup>ʔu<sup>4</sup>ʔi<sup>4</sup>] 's/he learns and forgets (it) over and over again' (GE.MFC.20160802)
  - /na<sup>4</sup> = ŋi<sup>1</sup>-ʔi<sup>4</sup>ʔi<sup>4</sup>/ (3.NonI.SBJ.MC.A = steal-DIR:back.and.forth) → [na<sup>4</sup>ŋi<sup>1</sup>ʔi<sup>4</sup>ʔi<sup>4</sup>] 's/he goes back and forth stealing' (GE.MFC.20160802)
  - /na<sup>4</sup> = gau<sup>1</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.cold = DEINTENS) → [na<sup>4</sup>ga<sup>5</sup>ʔu<sup>1</sup>ra<sup>1</sup>] 'it's sort of cold to the touch' (GE.MFC.20160802; 1 > 5 due to tone dissimilation)

Assimilation of /i/ is impossible when the base of affixation preceding /i/ consists of more than one syllable. It is irrelevant how the base of affixation achieves its size: assimilation fails to apply whether the base is a disyllabic root (50a), a monosyllabic root followed by an incorporate (50b), or a monosyllabic root followed by a non-nominal affix or clitic, such as the causative (50c). I take this to show that /i/ assimilation occurs only when the noncentral vowel and the /i/ belong to the same foot.

- (50) /i/ assimilation ceases to apply when the base of affixation exceeds one syllable
- Base is disyllabic root: /na<sup>4</sup> = nũ<sup>5</sup>ke<sup>3</sup>-\*ʔi<sup>4</sup>ne<sup>1</sup>/ (3.NonI.SBJ.MC.A-wrap.A-\*NI:entire.body) → [na<sup>4</sup>nũ<sup>5</sup>ke<sup>3</sup>ʔi<sup>4</sup>ne<sup>1</sup>] 's/he wraps his/her body' (GE.DGG.20160730)
  - Base is monosyllabic root plus incorporate: /na<sup>4</sup> = ŋau<sup>1</sup>-\*ʔtʃi<sup>5</sup>ru<sup>1</sup> = ʔi<sup>5</sup>tʃi<sup>1</sup>/ (3.NonI.SBJ.MC.A-be.worn.out-\*NI:clothes = INTENS) → [na<sup>4</sup>ŋau<sup>1</sup>ʔtʃi<sup>5</sup>ru<sup>1</sup>ʔi<sup>5</sup>tʃi<sup>1</sup>] 'his clothes/cloth is really worn out' (GE.MFC.20160727)
  - Base is monosyllabic root plus causative: /na<sup>4</sup> = na<sup>3</sup> = do<sup>43</sup>-ʔē<sup>4</sup>ʔē<sup>3</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = 3.NonI.OBJ.MC.A = be.soft-CAUS-DEINTENS) → [na<sup>4</sup>na<sup>3</sup>do<sup>43</sup>ʔē<sup>4</sup>ʔē<sup>3</sup>ʔi<sup>1</sup>ra<sup>1</sup>] 'he sort of makes it soft' (GE.MFC.20160802)

An exception to this generalization is that /i/ assimilation *can* apply in a larger than monosyllabic base if the tone of the final vowel of the base is identical to the tone of the /i/. Thus, while assimilation cannot apply in [na<sup>4</sup>ŋau<sup>1</sup>ʔtʃi<sup>5</sup>ru<sup>1</sup>ʔi<sup>5</sup>tʃi<sup>1</sup>] 'his cloth is really worn out,' it can apply in /na<sup>4</sup> = ŋau<sup>1</sup>-ʔtʃi<sup>5</sup>ru<sup>1</sup>-ʔi<sup>1</sup>ra<sup>1</sup>/ [na<sup>4</sup>ŋau<sup>1</sup>ʔtʃi<sup>5</sup>ru<sup>1</sup>ʔu<sup>1</sup>ra<sup>1</sup>] 'his cloth is sort of worn out' (GE.MFC.20160727). This is because the final tone of the stem /ŋau<sup>1</sup>-\*ʔtʃi<sup>5</sup>ru<sup>1</sup>/ 'be.worn.out-\*NI:clothes' is tone 1. When this tone 1 syllable is followed by a tone 5 /i/ syllable in the first form, it cannot assimilate because of the ban on assimilation outside the first foot. When it is followed by another tone 1 syllable in the second form, however, assimilation is licensed by the identity in tone between the /i/ and /i/ syllables. Whether this exception applies is not sensitive to the size of the base of affixation.

There are some forms in my data where the environment for assimilation is present, but where at least one speaker felt that assimilation was illicit. These forms do not represent a phonological natural class. For example, speakers rejected assimilation in forms such as /na<sup>4</sup> = tʃi<sup>1</sup>-ʔi<sup>4</sup>ne<sup>1</sup>/ 'his/her entire body (of a person) is delicious' but accepted it in phonologically very similar forms such

as /na<sup>4</sup> = ŋj<sup>1</sup>-ʔi<sup>4</sup>ʔi<sup>4</sup>/ 's/he goes back and forth stealing.' All of the forms where speakers rejected assimilation are semantically anomalous. Consequently, I assume that the speakers' rejection of assimilation in these items is related to the fact that they have never encountered the forms, rather than showing that the rejected forms are lexical exceptions.

There are three areas of interspeaker variation in /i/ assimilation. One is the obligatoriness of the process. I worked on this topic with three speakers. Two, LWG and DGG, typically judged forms that failed to display the process as illicit (though LWG accepted more forms without it than DGG). The third, MFC, preferred forms with the assimilation but also occasionally produced or accepted forms that failed to display it.

The second area of interspeaker variation in /i/ assimilation relates to the treatment of diphthongs. There are three possible outcomes of assimilation of /i/ to the diphthongs /au/ and /ai/. One is for the diphthong to be resyllabified as two syllables, with the second member of the diphthong taking the place of the /i/ (51a). This outcome can be schematically represented as /aV.i/ → [a.V]. Another is for the /i/ to assimilate to the quality of the second member of the diphthong (51b), represented as /aV.i/ → [aV.V]. The third outcome is for the /i/ to fail to assimilate (51c), represented /aV.i/ → [aV.i]. This final outcome can be seen in two ways: as the diphthong being treated as disyllabic, or as it being treated as a central vowel.

(51) Possible outcomes of /i/ assimilation triggered by a diphthong

- a. /aV.i/ → [a.V]: /na<sup>4</sup> = dau<sup>4</sup> = ʔi<sup>1</sup>ra<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.red = DEINTENS) → [na<sup>4</sup>da<sup>4</sup>ʔu<sup>1</sup>ra<sup>1</sup>] 'it's sort of red' (GE.DGG.20160803)
- b. /aV.i/ → [aV.V]: /na<sup>4</sup> = dau<sup>2</sup>-ʔi<sup>4</sup>ʔi<sup>4</sup>/ (3.NonI.SBJ.MC.A = see-DIR:back.and.forth) → [na<sup>4</sup>dau<sup>2</sup>ʔu<sup>4</sup>ʔi<sup>4</sup>] 's/he looks back and forth' (GE.MFC.20160727)
- c. /aV.i/ → [aV.i]: /na<sup>4</sup> = gau<sup>1</sup>-ʔi<sup>5</sup>tʃi<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.cold-INTENS) → [na<sup>4</sup>gau<sup>1</sup>ʔi<sup>5</sup>tʃi<sup>1</sup>] 'it's really cold to the touch' (GE.LWG.20160726)

Of the three speakers mentioned above, DGG and LWG regularly produced and accepted the [a.V] and [aV.i] outcomes for the same words, suggesting that phonological and lexical information underdetermine which of these outcomes occurs in a given production. Only MFC produced or accepted the [aV.V] outcome. He also produced and accepted the [a.V] and [aV.i] outcomes. The [a.V] outcome is the only one that I have observed in texts.

The behavior of diphthongs in /i/ assimilation -- specifically, the fact that they permit assimilation while other vowel sequences do not -- is one of the facts that show that diphthongs are tautosyllabic, while all other vowel sequences are heterosyllabic. This behavior also bears a strong resemblance to alternations, in certain verb roots, between root allomorphs of the form (C)VʔV and (C)VVʔ (§6.4). Many roots which undergo this type of alternation have a diphthong as the nucleus. It is not possible to analyze the (C)VʔV ~ (C)VVʔ alternation and the behavior of diphthongs together at this stage, though, because the conditioning environment of the (C)VʔV ~ (C)VVʔ is not yet clear.

The third area of variation in /i/ assimilation involves the focus of the process. For the speakers I worked with on the process, it applies only to oral /i/. In texts, however, I have tokens where the process appears to apply to nasal /ī/. This is an area for further work as well.

/i/ assimilation does not interact with other phonological or morphological processes.

### 6.2.3 Assimilation of /a/

When the vowel quality /a/ occurs following /o/ within the foot, either adjacent or separated only by glottal stop, the /a/ assimilates completely to the /o/ in quality and nasality (52). This process is similar to /i/ assimilation in outcome -- both lead to assimilation of a central vowel to a noncentral vowel -- and in environment. Like /i/ assimilation, it is insensitive to the laryngeal features of the syllables involved (52b,d,e) and does not apply to /oa/ sequences which occur outside the first two syllables of the word (53). This process is counterfered by a postlexical process which lowers /u/ to [o] preceding [a] (§6.1.4).

(52) /oa/ assimilation: /a/ → [o] / [o(?)]<sub>F</sub> (GE.DGG.20160803)

- a. /oa/: /na<sup>4</sup> = do<sup>43</sup>-\*ʔa<sup>3</sup>ki/ (3.NonI.SBJ.MC.A = be.soft-\*NI:daughter) → [na<sup>4</sup>do<sup>43</sup>ʔo<sup>3</sup>ki<sup>1</sup>] 'his/its offspring is soft'
- b. /oa/: /na<sup>4</sup> = tʃo<sup>1</sup>-\*a<sup>5</sup>ti<sup>3</sup>/ (3.NonI.SBJ.MC.A = be.white-\*NI:leaf) → [na<sup>4</sup>tʃo<sup>1</sup>o<sup>5</sup>ti<sup>3</sup>] 'its leaves are white'
- c. /oã/: /to<sup>1</sup> = ʔã<sup>3</sup>ma<sup>3</sup>/ (other = COLL) → [to<sup>1</sup>ʔõ<sup>3</sup>ma<sup>3</sup>] 'and some others, et cetera'
- d. /oa/: /to<sup>1</sup>-\*ʔa<sup>1</sup>/ (other-\*mouth) → [to<sup>1</sup>ʔo<sup>1</sup>] 'other one's mouth'
- e. /oã/: /to<sup>1</sup>-\*ʔã<sup>1</sup>ti<sup>3</sup>/ (other-\*yard) → [to<sup>1</sup>ʔõ<sup>1</sup>ti<sup>3</sup>] 'other one's yard'

(53) /oa/ assimilation fails to apply when base is disyllabic or larger

- a. /ŋo<sup>3</sup>ʔo<sup>1</sup>-a<sup>1</sup>ne<sup>1</sup>/ (fish.sp-garden) → [ŋo<sup>3</sup>ʔo<sup>1</sup>a<sup>1</sup>ne<sup>1</sup>], \*[ŋo<sup>3</sup>ʔo<sup>1</sup>o<sup>1</sup>ne<sup>1</sup>] 'place where there are lots of ŋo<sup>3</sup>ʔo<sup>1</sup> fish' (GE.DGG.20160806)
- b. /bo<sup>2</sup>ʔo<sup>3</sup> = a<sup>1</sup>ʔi<sup>5</sup>/ (grub.sp = IBEN) → [bo<sup>2</sup>ʔo<sup>3</sup>a<sup>1</sup>ʔi<sup>5</sup>], \*[bo<sup>2</sup>ʔo<sup>3</sup>o<sup>1</sup>ʔi<sup>5</sup>] 'to the plantain grub' (GE.DGG.20160803)

This process displays three differences from /i/ assimilation. First, as shown in (52c,e), /oa/ assimilation is insensitive to nasality. It applies to both /ã/ and /a/, while /i/ assimilation applies only to oral /i/. Second, /oa/ assimilation is triggered only by /o/, not by other noncentral vowels. And third, /oa/ assimilation is not obligatory. Two of the three speakers I worked with on the process found forms in which /oa/ assimilation had applied and those in which it had not applied to be equally licit, and texts contain some tokens in which the environment of the process is present, but it has failed to apply. The process is present, however, at all speech rates.

There are no alienably possessed noun roots, verb roots, or adverbs which display noncentral vowel-/i/ sequences or /oa/ sequences in the first two syllables. This means that the constraints which enforce /i/ assimilation and /oa/ assimilation are not subject to non-derived environment blocking.

### 6.2.4 Dissimilation of /1̣1̣/ and /1̣1̣/ sequences

Despite (or perhaps because of) CT's large number of tone contrasts, the language displays only two lexical phonological processes affecting tone: dissimilation of tone 1̣ syllables in the first foot of the word, and a tone circle triggered on the last syllable of the stem by certain suffixes and clitics. While these processes empirically overlap, here I discuss metrically conditioned dissimilation of tone 1̣ syllables as an independent phenomenon.

When a tone 1 syllable occurs as the first syllable of the Prosodic Word and immediately precedes another tone 1 syllable -- modal voice or laryngealized -- the word-initial tone 1 syllable obligatorily becomes tone 5 (54). The process fails to apply when a tonally identical sequence occurs after the first two syllables of the stress domain (55). The only phonological facts relevant to this process are the laryngeal features of the syllables and their prosodic position. The segmental features and nasality of the syllables are irrelevant.

- (54) Tone 1 dissimilation: /1/ → [5] / [1]<sub>F</sub>
- /11/: /ka<sup>1</sup>-\*ʔã<sup>1</sup>ti<sup>3</sup>/ (fruit.sp-\*yard) → [ka<sup>5</sup>ã<sup>1</sup>ti<sup>3</sup>] 'yard planted with ka<sup>1</sup> trees' (ABS p 153)
  - /11/: /ka<sup>1</sup>-\*a<sup>1</sup>ne<sup>1</sup>/ (fruit.sp-\*garden) → [ka<sup>5</sup>a<sup>1</sup>ne<sup>1</sup>] 'garden of ka<sup>1</sup> trees' (GE.DGG.20160806)
  - /11/: /na<sup>4</sup>=tʃo<sup>1</sup>-\*ã<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.white-\*NI:mouth) → [na<sup>4</sup>tʃo<sup>5</sup>o<sup>1</sup>] 'his/its mouth is white' (GE.DGG.20160806)
  - /11/: /na<sup>4</sup>=tʃo<sup>1</sup>-\*gi<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.white-\*NI:blood) → [na<sup>4</sup>tʃo<sup>5</sup>gi<sup>1</sup>] 'his/its blood/latex is white' (GE.DGG.20160806)
- (55) Tone 1 dissimilation fails to apply when the base is disyllabic or larger
- /X11/: /ko<sup>2</sup>re<sup>1</sup>-\*ʔã<sup>1</sup>ti<sup>3</sup>/ (sweet.potato-\*yard) → [ko<sup>2</sup>re<sup>1</sup>ʔã<sup>1</sup>ti<sup>3</sup>] 'yard planted with sweet potatoes' (GE.DGG.20160806)
  - /X11/: /ko<sup>2</sup>re<sup>1</sup>-\*a<sup>1</sup>ne<sup>1</sup>/ (sweet.potato-\*garden) → [ko<sup>2</sup>re<sup>1</sup>a<sup>1</sup>ne<sup>1</sup>] 'garden of sweet potatoes' (GE.DGG.20160806)
  - /XX11/: /tʃau<sup>1</sup>-\*e<sup>3</sup>ja<sup>1</sup>-\*ʔã<sup>1</sup>ti<sup>3</sup>/ (1SG-\*sister-\*yard) → [tʃau<sup>1</sup>e<sup>3</sup>ja<sup>1</sup>ʔã<sup>1</sup>ti<sup>3</sup>] 'my sister's yard' (GE.ABS.20160804)
  - /XX11/: /tʃau<sup>1</sup>-\*e<sup>3</sup>ja<sup>1</sup>-\*a<sup>1</sup>ne<sup>1</sup>/ (1SG-\*sister-\*garden) → [tʃau<sup>1</sup>e<sup>3</sup>ja<sup>1</sup>a<sup>1</sup>ne<sup>1</sup>] 'my sister's garden' (GE.ABS.20160804)

This process is completely exceptionless with verb roots, including monosyllabic 1 nouns that are zero nominalizations of verb roots. Speakers do, however, sometimes find it acceptable to underapply the process in words where the base of affixation is a monosyllabic, underived 1 noun. To my knowledge, there are only three such nouns: tɔ<sup>1</sup> 'Night Monkey'; o<sup>1</sup> 'wound'; and ka<sup>1</sup>, the name of a fruit species. o<sup>1</sup> does not participate in this process at all, because it is suppleted by its disyllabic 13 allomorph o<sup>1</sup>ri<sup>3</sup> whenever it bears an affix or clitic. tɔ<sup>1</sup> and ka<sup>1</sup> seem to be very infrequent words. (For example, Ticuna speakers are often surprised that I know these words, and many people who are excellent Spanish speakers do not know how to gloss them in Spanish.) I assume that the underapplication of the process in these words reflects that speakers have almost no evidence in the input about whether this process applies in non-deverbal nouns.

There are words in the lexicon with surface initial 11 sequences, such as du<sup>1</sup>ru<sup>1</sup> 'tremble,' wa<sup>1</sup>ti<sup>1</sup>mi<sup>3</sup> 'be boring,' and da<sup>1</sup>we<sup>1</sup> 'be sick.' These words show that tone 1 dissimilation, unlike the other lexical phonological processes, is subject to non-derived environment blocking. Tone 1 dissimilation is counterfered by the postlexical process of laryngealization spreading (§6.1.5), as predicted by the ordering component of Lexical Phonology. It is counterbled by the nominalizer tone circle (§6.3.2), a morphologically conditioned lexical process.

### 6.3 Morphologically conditioned phonology

CT displays at least two morphologically conditioned phonological processes, excluding those involving glottal stop. The simpler one is the monophthongization of /au/ in the 1SG inalienable possession pronoun /tʃau<sup>1</sup>/ (§6.3.1). The more complex morphologically conditioned process is the nominalizer tone circle. In this process, a natural class of deverbal nominalizers, among several other affixes and clitics, induce a complex set of tone alternations on the final syllable of the verb stem on which they appear. I discuss this phenomenon in §6.3.2. I then outline topics for further research in morphologically conditioned phonology in §6.3.3. Finally, I address additional phenomena which could be viewed as morphologically conditioned phonology (§6.3.4).

#### 6.3.1 Monophthongization of tʃau<sup>1</sup>

The 1SG inalienable possession pronoun /tʃau<sup>1</sup>/ undergoes unique allomorphy. When /tʃau<sup>1</sup>/ is followed by a labial consonant or a glottal stop-labial cluster, it monophthongizes to [tʃo<sup>1</sup>] (56) in a form of labial attraction. It is impossible to tell whether /tʃau<sup>1</sup>/ would also monophthongize preceding back vowels because there are no inalienably possessed nouns that begin with back vowels.

- (56) /tʃau/ 1SG → [tʃo<sup>1</sup>] / \_(?)C[ +lab] (GE.DGG.20160718, GE.DGG.20160730)
- Preceding /p/: /tʃau<sup>1</sup>-\*pa<sup>4</sup>ta<sup>3</sup>/ → [tʃo<sup>1</sup>pa<sup>4</sup>ta<sup>3</sup>] 'my house'
  - Preceding /b/: /tʃau<sup>1</sup>-\*bi<sup>2</sup>/ → [tʃo<sup>1</sup>bi<sup>2</sup>] 'my starchy food'
  - Preceding /m/: /tʃau<sup>1</sup>-\*mi<sup>1</sup>ki<sup>3</sup>/ → [tʃo<sup>1</sup>mi<sup>1</sup>ki<sup>3</sup>] 'my companion'
  - Preceding /ʔm/: /tʃau<sup>1</sup>-\*ʔmā<sup>1</sup>/ → [tʃo<sup>1</sup>ʔmā<sup>1</sup>] 'my wife'
  - Preceding /w/: /tʃau<sup>1</sup>-\*we<sup>3</sup>mī<sup>1</sup>/ → [tʃo<sup>1</sup>we<sup>3</sup>mī<sup>1</sup>] 'my cooked food'

Verb roots of the form (C)au do not undergo this allomorphy when they are followed by incorporated inalienable nouns beginning with labials (57), even though the same phonological processes generally apply between verb roots and incorporated inalienable nouns as between possessors and inalienable nouns. I do not have data on the behavior of nouns in this process because I am not aware of any underived nouns of the form (C)au.

- (57) (C)au verb roots do not undergo monophthongization / \_(?)C[ +lab] (GE.DGG.20160730)
- Preceding /p/: /na<sup>4</sup>=dau<sup>4</sup>-pa<sup>4</sup>ta<sup>3</sup>/ (3.NonI.SBJ.MC.A = be.red-\*NI:house) → [na<sup>4</sup>dau<sup>4</sup>pa<sup>4</sup>ta<sup>3</sup>], \* [na<sup>4</sup>do<sup>4</sup>pa<sup>4</sup>ta<sup>3</sup>] 'his/her house is red'
  - Preceding /w/: /na<sup>4</sup>=ŋau<sup>1</sup>-we<sup>3</sup>ī<sup>1</sup>/ (3.NonI.SBJ.MC.A = be.worn.out-\*NI:canoe) → [na<sup>4</sup>ŋau<sup>1</sup>we<sup>3</sup>ī<sup>1</sup>], \* [na<sup>4</sup>ŋo<sup>1</sup>we<sup>3</sup>ī<sup>1</sup>] 'his/her canoe is worn out'

/tʃau<sup>1</sup>/ can also monophthongize to [tʃa<sup>1</sup>] preceding the initial /k/ of the inalienable noun \*ku<sup>2</sup>tī<sup>3</sup> 'foot,' but not preceding velars in other inalienable nouns (GE.DGG.20160718, 20160730).

#### 6.3.2 The nominalizer tone circle

CT displays six productive nominalizing processes. Two nominalizers can potentially derive a noun of any noun class, while four nominalizers derive a noun of a specific class. These four

Table 3: The nominalizer tone circle on stressed syllables (cf. Anderson 1962:369)

Level tones		Contour tones	
Isolation tone	Tone preceding nominalizer	Isolation tone	Tone preceding nominalizer
1̣	5	31	3
1	1, 1?3	43	31
2	2	51	51
3	2		
4	1		

nominalizers have the segmental exponents  $-(?)e^3$ , for Class I;  $-(?)ki^3$ , for Class II;  $-ʔi^5ne^1$ , for Class III; and  $-ʔi^4$ , for Class IV. Because of their close relationship with noun class, I refer to these elements as the class nominalizers. The morphology of these elements is discussed in §9.2.3. Here, it is relevant only that the class nominalizers appear on verb stems and that they are extremely token frequent.

All of the class nominalizers trigger the nominalizer tone circle, a set of tonal alternations affecting the last syllable of the verb stem that bears the nominalizer. The morphological affiliation of the stem-final syllable is irrelevant to the tone circle: the same alternations appear whether the final syllable belongs to the verb root, an incorporate, or a verbal suffix or enclitic. Besides the nominalizers, two other elements trigger at least some of the same alternations as the tone circle. These are the clitics  $=ʔi^1ra^1$  DEINTENS and  $=a^3ka^1$  'taste/smell of X (inalienable noun); taste/smell like X (denominal verb).'

**The nominalizer tone circle on stressed syllables** The effects of the tone circle are different for stressed syllables -- that is, monosyllabic verb roots -- and unstressed syllables. (3) displays the alternations which occur on stressed syllables in the tone circle. Note that, because of the phonotactics of tone 5 and tone 41 (§4.5.2), syllables with these tones never occur in the tone circle environment.

I now exemplify the tone alternations shown in (3). All forms in the following examples are based on pitch tracks in a series of tone frame recordings made with speaker LWG on August 6, 2016. The tone frame used to record words in isolation was  $ni^{31}ma^4 X ja^4a^2ʔi^4$  's/he said X.' The same frame was used for Class IV nominalizations elicited alone or in purpose clauses. Nominalizations of other classes, and some Class IV nominalizations, were elicited as relative clauses modifying a semantically appropriate head. The last word in the relative clause, which is obligatorily the nominalized verb, was again followed by the quotative  $ja^4a^2ʔi^4$ . Transitive verbs were elicited with semantically appropriate nouns as objects. This was necessary to control for the tonal effects of the 3SBJ>3OBJ.SC pronominal enclitic on the verb stem (§6.3.3).

I begin with tone 1̣. This tone displays the same allotony in the nominalizer tone circle as in prosodically and morphologically conditioned dissimilation contexts: it becomes tone 5 (58). As in all parts of the tone circle, the two vowels of a diphthong behave as a single TBU (58f).

(58) The nominalizer tone circle: Tone 1̣

- a. Isolation / $\eta a^1$ / 'be raw': / $na^4 = \eta a^1$ / → [ $na^4 \eta a^1$ ] 'it is raw'

- b. Becomes tone 5 preceding Class IV nominalizer: /na<sup>1</sup> = ηa<sup>1</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>ηa<sup>5</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that it is raw'
- c. Isolation /te<sup>1</sup>/ 'be sharp': /na<sup>4</sup> = te<sup>1</sup>/ → [na<sup>4</sup>te<sup>1</sup>] 'it is sharp'
- d. Becomes tone 5 preceding Class IV nominalizer: /na<sup>1</sup> = te<sup>1</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>te<sup>5</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that it is sharp'
- e. Isolation /gau<sup>1</sup>/ 'be cold to the touch': /na<sup>4</sup> = gau<sup>1</sup>/ → [na<sup>4</sup>gau<sup>1</sup>] 'it is cold'
- f. Becomes tone 5 preceding Class IV nominalizer: /na<sup>1</sup> = gau<sup>1</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>4</sup>gau<sup>5</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that it is cold'

The behavior of tone 1 is subject to conditioning by syllable weight. If the stem-final syllable has tone 1 and a diphthong, there is no change in the circle (59). If the stem-final syllable has tone 1 and a monophthong nucleus, on the other hand, it undergoes reduplication of the vowel and epenthesis of a glottal stop between the base vowel and the reduplicant. Thus, a stem-final syllable of the form (C)V becomes (C)VʔV. In the base-reduplicant string, the base vowel remains tone 1, but the reduplicant vowel is assigned tone 3 (60). This is the only process sensitive to syllable weight that I have observed.

(59) The nominalizer tone circle: Tone 1, diphthong

- a. Isolation /dai<sup>1</sup>/ 'hit, kill, PLACT': /na<sup>4</sup> = na<sup>3</sup> = dai<sup>1</sup>/ → [na<sup>4</sup>na<sup>3</sup>dai<sup>1</sup>] 's/he kills them'
- b. No change preceding Class IV nominalizer: (wo<sup>3</sup>ka<sup>1</sup>gi<sup>4</sup> na<sup>4</sup>ʔ) /na<sup>1</sup> = dai<sup>1</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>dai<sup>1</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that s/he kills (the) cows'
- c. Isolation /ηau<sup>1</sup>/ 'be worn out': /na<sup>4</sup> = ηau<sup>1</sup>/ → [na<sup>4</sup>ηau<sup>1</sup>] 'it is worn out'
- d. No change preceding Class IV nominalizer: /na<sup>1</sup> = ηau<sup>1</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>ηau<sup>1</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that it is worn out'

(60) The nominalizer tone circle: Tone 1, monophthong

- a. Isolation /jo<sup>1</sup>/ 'cut with scissors': /na<sup>4</sup> = na<sup>3</sup> = jo<sup>1</sup>/ → [na<sup>4</sup>na<sup>3</sup>jo<sup>1</sup>] 's/he cuts it with scissors'
- b. Becomes [jo<sup>1</sup>ʔo<sup>3</sup>] preceding Class IV nominalizer: (po<sup>3</sup>pe<sup>3</sup>ra<sup>1</sup>) /na<sup>1</sup> = jo<sup>1</sup>-ʔi<sup>4</sup>-ka<sup>1</sup>/ → /na<sup>1</sup>jo<sup>1</sup>ʔo<sup>3</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that s/he cuts (the) paper with scissors'
- c. Isolation /ka<sup>1</sup>/ 'call, yell': /ni<sup>4</sup> = ka<sup>1</sup>/ → [ni<sup>4</sup>ka<sup>1</sup>] 's/he yells'
- d. Becomes [ka<sup>1</sup>ʔa<sup>3</sup>] preceding Class IV nominalizer: /ja<sup>1</sup> = ka<sup>1</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [ja<sup>1</sup>ka<sup>1</sup>ʔa<sup>3</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that s/he yells'

Tone 2 is unaffected by the circle. Stem-final tone 2 syllables remain tone 2 and maintain their underlying segmental form in the nominalization environment (61).

(61) The nominalizer tone circle: Tone 2

- a. Isolation /ja<sup>2</sup>/ 'grow': /na<sup>4</sup> = ja<sup>2</sup>/ → [na<sup>4</sup>ja<sup>2</sup>] 's/he is growing'
- b. No change preceding Class IV nominalizer: /na<sup>1</sup> = ja<sup>2</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>ja<sup>2</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that s/he grows'
- c. Isolation /mu<sup>2</sup>/ 'bring/take/send animate being': /na<sup>4</sup> = na<sup>3</sup> = mu<sup>2</sup>/ → [na<sup>4</sup>na<sup>3</sup>mū<sup>2</sup>] 's/he sends him/her'
- d. No change preceding Class IV nominalizer: (Ka<sup>3</sup>ru<sup>1</sup>ʔi<sup>3</sup>) /na<sup>1</sup> = mu<sup>2</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>mu<sup>2</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that s/he sends Carlos'

- e. Isolation /tai<sup>2</sup>/ 'be hard': /na<sup>4</sup> = tai<sup>2</sup>/ → [na<sup>4</sup>tai<sup>2</sup>] 'it is hard'
- f. No change preceding Class IV nominalizer: /na<sup>1</sup> = tai<sup>2</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>tai<sup>2</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that it is hard'

The activity of tones 1, 1, and 2 in the circle is similar: they rise or are unaffected. The upper level tones, tones 3 and 4, display contrasting behavior: they fall.

First, tone 3 undergoes a very subtle change in the tone circle: it becomes tone 2 (62). Monophthongal tone 3 syllables maintain their segmental form. I have no data on the behavior of tone 3 diphthongs because there are no verb roots of this form.

(62) The nominalizer tone circle: Tone 3

- a. Isolation /ã<sup>3</sup>/ 'give': /na<sup>4</sup> = na<sup>3</sup> = ã<sup>3</sup>/ → [na<sup>4</sup>na<sup>3</sup>ʔã<sup>3</sup>] 's/he gives it'
- b. Becomes [ã<sup>2</sup>] preceding Class IV nominalizer: /wi<sup>43</sup>ʔi<sup>4</sup> i<sup>4</sup> ã<sup>3</sup>ʔi<sup>4</sup>/ → [wi<sup>43</sup>ʔi<sup>4</sup> i<sup>4</sup> ã<sup>2</sup>ʔi<sup>4</sup>] 'one (Class IV) that gives'
- c. Isolation /mu<sup>3</sup>/ 'weave': /na<sup>4</sup> = na<sup>3</sup> = mu<sup>3</sup>/ → [na<sup>4</sup>na<sup>3</sup>mu<sup>3</sup>] 's/he weaves it'
- d. Becomes [mu<sup>2</sup>] preceding Class IV nominalizer: /wi<sup>43</sup>ʔi<sup>4</sup> i<sup>4</sup> mu<sup>3</sup>-ʔi<sup>4</sup>/ → [wi<sup>43</sup>ʔi<sup>4</sup> i<sup>4</sup> mu<sup>2</sup>ʔi<sup>4</sup>] 'one (Class IV) that weaves'
- e. Isolation /pu<sup>3</sup>/ 'rain': /na<sup>4</sup> = pu<sup>3</sup>/ → [na<sup>4</sup>pu<sup>3</sup>] 'it rains'
- f. Becomes [pu<sup>2</sup>] preceding Class II nominalizer: /wi<sup>43</sup>ʔi<sup>4</sup> ja<sup>4</sup> pu<sup>3</sup>-ki<sup>3</sup>/ → [wi<sup>43</sup>ʔi<sup>4</sup> ja<sup>4</sup> pu<sup>2</sup>ki<sup>3</sup>] 'a (period of) rain'

While this change would be difficult to perceive on the verb root in isolation, recall that the nominalizer tone circle is triggered by specific affixes that appear immediately following the affected syllable, and that five of these six affixes have tone 3, 4, or 5. Therefore, perceiving the change of tone 3 in the nominalizer tone circle generally does not involve perceiving the contrast between tone 2 and tone 3 in isolation, but rather the difference between (for example) a 34 vs. a 24 tone melody.

Second, tone 4 undergoes a larger change in the circle. It becomes tone 1 (63). There is no change in the segmental form of the syllable for either diphthongs or monophthongs.

(63) The nominalizer tone circle: Tone 4

- a. Isolation /dau<sup>4</sup>/ 'be red': /na<sup>4</sup> = dau<sup>4</sup>/ → [na<sup>4</sup>dau<sup>4</sup>] 'it is red'
- b. Becomes [dau<sup>1</sup>] preceding Class IV nominalizer: /na<sup>1</sup> = dau<sup>4</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>dau<sup>1</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that it is red'
- c. Isolation /mũ<sup>4</sup>/ 'be numerous (count noun)': /na<sup>4</sup> = mũ<sup>4</sup>/ → [na<sup>4</sup>mũ<sup>4</sup>] 'they are numerous'
- d. Becomes [mũ<sup>1</sup>] preceding Class IV nominalizer: /na<sup>1</sup> = mũ<sup>4</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>mũ<sup>1</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that they are numerous'
- e. Isolation /ŋe<sup>4</sup>/ 'take hold of': /na<sup>4</sup> = na<sup>3</sup> = ŋe<sup>4</sup>/ → [na<sup>4</sup>na<sup>3</sup>ŋe<sup>4</sup>] 's/he takes hold of it'
- f. Becomes [ŋe<sup>1</sup>] preceding Class IV nominalizer: (po<sup>3</sup>pe<sup>3</sup>ra<sup>1</sup>) /ja<sup>1</sup> = ŋe<sup>4</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [ja<sup>1</sup>ŋe<sup>1</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that s/he takes hold of (the) paper/book'

Contour tones also undergo the tone circle. I begin with contour tones 43 and 31. Recall that, when level tones undergo the tone circle, tone 3 becomes tone 2, while tone 1 either remains

1 or becomes tone 3, depending on the weight of the syllable affected and its position in the word. It would be reasonable to expect that monosyllabic tone 31 verb roots would pattern with prosodically similar tone 1 diphthongs, and be unchanged by the tone circle. But in fact, tone 31 -- like unstressed tone 1 -- becomes level tone 3 (64). There is no change to segmental content for monophthongs. I do not have data on the behavior of tone 31 diphthongs, although there are at least two verb roots of the relevant form.

(64) The nominalizer tone circle: Tone 31

- a. Isolation /bu<sup>31</sup>/ 'be immature': /na<sup>4</sup> = bu<sup>31</sup>/ → [na<sup>4</sup>bu<sup>31</sup>] 's/he is a child; it (a plant) is immature'
- b. Becomes [bu<sup>3</sup>] preceding Class IV nominalizer: /bu<sup>31</sup>-ʔi<sup>4</sup>/ → [bu<sup>3</sup>ʔi<sup>4</sup>] 'child'
- c. Isolation /de<sup>31</sup>/ 'select': /na<sup>4</sup> = na<sup>3</sup> = de<sup>31</sup>/ → [na<sup>4</sup>na<sup>3</sup>de<sup>31</sup>] 's/he selects them'
- d. Becomes [de<sup>3</sup>] preceding Class IV nominalizer: /wi<sup>43</sup>ʔi<sup>4</sup> i<sup>4</sup> de<sup>31</sup>-ʔi<sup>4</sup>/ → [wi<sup>43</sup>ʔi<sup>4</sup> i<sup>4</sup> de<sup>3</sup>ʔi<sup>4</sup>] 'one that is selected'
- e. Isolation /i<sup>31</sup>/ 'come/go/walk.PLACT': /ni<sup>41</sup> = i<sup>31</sup>/ → [ni<sup>41</sup>ʔi<sup>31</sup>] 'they walk'
- f. Becomes [i<sup>3</sup>] preceding Class IV nominalizer: /du<sup>1</sup>i<sup>31</sup>-ʔi<sup>4</sup> i<sup>4</sup> i<sup>31</sup>-ʔi<sup>4</sup>/ → [du<sup>1</sup>i<sup>3</sup>ʔi<sup>4</sup> i<sup>4</sup> i<sup>3</sup>ʔi<sup>4</sup>] 'people that walk'

Likewise, tone 43 does not pattern with either tone 4 or tone 3. Instead, it becomes 31 in the circle (65). Diphthongs and monophthongs with tone 43 display identical behavior.

(65) The nominalizer tone circle: Tone 43

- a. Isolation /dau<sup>43</sup>/ 'touch (something prohibited)': (ni<sup>31</sup>ʔi<sup>3</sup>) /na<sup>4</sup>dau<sup>43</sup>/ → [na<sup>4</sup>dau<sup>43</sup>] 's/he touches (it)'
- b. Becomes [dau<sup>31</sup>] preceding Class IV nominalizer: (ni<sup>31</sup>ʔi<sup>3</sup>) /na<sup>1</sup> = dau<sup>43</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>dau<sup>31</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that s/he touches it'
- c. Isolation /ta<sup>43</sup>/ 'be big': /na<sup>4</sup> = ta<sup>43</sup>/ → [na<sup>4</sup>ta<sup>43</sup>] 'it is big'
- d. Becomes [ta<sup>31</sup>] preceding Class IV nominalizer: /na<sup>1</sup> = ta<sup>43</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>ta<sup>31</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that it is big'
- e. Isolation /ũ<sup>43</sup>/ 'come/go/walk.SGACT': /na<sup>4</sup> = ũ<sup>43</sup>/ → [na<sup>4</sup>ʔũ<sup>43</sup>] 's/he walks'
- f. Becomes [ũ<sup>31</sup>] preceding Class IV nominalizer: /na<sup>1</sup> = ũ<sup>43</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>ʔũ<sup>31</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that s/he walks'

Contour tone 51 patterns apart from the two other contours, as well as from tone 1. Like tone 2, it is unaffected by the circle (66). I am not aware of any verb roots with tone 51 on a diphthong.

(66) The nominalizer tone circle: Tone 51

- a. Isolation /tu<sup>51</sup>/ 'pull': /na<sup>4</sup> = na<sup>3</sup> = tu<sup>51</sup>/ → [na<sup>4</sup>na<sup>3</sup>tu<sup>51</sup>] 's/he pulls it'
- b. Remains [tu<sup>51</sup>] preceding Class IV nominalizer: (ti<sup>4</sup> = ʔi<sup>3</sup>) /na<sup>1</sup> = tu<sup>51</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>tu<sup>51</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that s/he pulls (the) thread'
- c. Isolation /wi<sup>51</sup>/ 'cut with knife': /na<sup>4</sup> = na<sup>3</sup> = wi<sup>51</sup>/ → [na<sup>4</sup>na<sup>3</sup>wi<sup>51</sup>] 's/he cuts it (with a knife)'
- d. Remains [wi<sup>51</sup>] preceding Class IV nominalizer: (na<sup>31</sup>ma<sup>1</sup>t[i<sup>3</sup>ʔi<sup>3</sup>]) /na<sup>1</sup> = wi<sup>51</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>wi<sup>51</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that s/he cuts (the) meat (with a knife)'

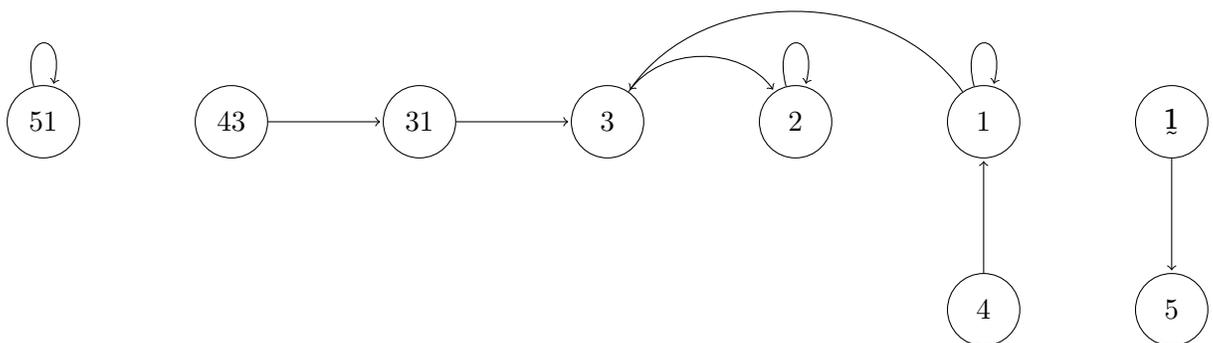
There are some verb roots which display irregular behavior in the circle. For example, the tone 43 verb root  $ja^{43}$  'be heavy' (cf.  $ja^2$  'be adult') behaves like other tone 43 verb roots, becoming tone 31, preceding the Class II and Class IV nominalizers (67). Preceding the Class I nominalizer, however, it becomes tone 5 (67). This may be related to the behavior of tone 4 transitive verb roots followed by the 3.NonI.SBJ>3.NonI.OBJ.SC enclitic, which also become tone 5 (below).

(67) Exceptional behavior of  $ja^4$  'be heavy' in the nominalizer tone circle

- Isolation / $ja^{43}$ / 'be heavy': / $na^4 = ja^{43}$ / → [ $na^4 ja^{43}$ ] 's/he is heavy'
- Becomes [ $ja^{31}$ ] preceding Class IV nominalizer in purpose clause: / $na^1 = ja^{43} - \eta^4 = ka^1$ / → [ $na^1 ja^{31} \eta^4 ka^1$ ] 'so that s/he is heavy'
- Becomes [ $ja^{31}$ ] preceding Class IV nominalizer in relative clause: / $wi^{43} \eta^4 i^2 ja^{43} - \eta^4$ / → [ $wi^{43} \eta^4 i^4 ja^{31} \eta^4$ ] 'one (Class IV inanimate) that is heavy'
- Becomes [ $ja^{31}$ ] preceding Class II nominalizer: / $ja^{31} \eta^3 ja^4 ja^{43} - ki^3$ / → [ $ja^{31} \eta^3 ja^4 ja^{31} ki^3$ ] 'man that is heavy'
- But becomes [ $ja^5$ ] preceding Class I nominalizer: / $\eta e^{31} - \eta e^3 ja^4 ja^{43} - \eta e^3$ / → [ $\eta e^{31} \eta e^3 ja^4 ja^5 e^3$ ] 'woman that is heavy'

While I have described the level tones in order of height, and the contour tones separately, it is more productive to view the nominalizer tone circle as a combination of a chain shift -- affecting some contours and some level tones -- and two non-chain shifts. One chain involves tones 43, 31, 3, 2, and 1, in that order. When the nominalizer tone circle applies, each tone in this chain changes to the following tone, except that (a) tone 2 fails to undergo any change and (b) tone 1 bounces back (Mortensen 2006) to tone 3. Tone 1 and tone 4 participate in a non-chain shift which tone 4 becomes tone 1, but tone 1 fails to become tone 4. Meanwhile, the tones at the outer edges of the phonetic space participate in very different alternations, or fail to participate at all. Tone 1 becomes tone 5, but tone 5 -- because of its distribution -- cannot appear in the environment for the circle. Tone 51 can appear in this environment, but fails to participate in the circle in any meaningful way. This view is graphically summarized in (68).

(68) The nominalizer tone circle on stressed syllables represented graphically



**The nominalizer tone circle on unstressed syllables** For some tones, the nominalizer tone circle causes different alternations when the tone appears on a stressed syllable (here, equivalent to a monosyllabic verb root) than on an unstressed syllable. Table 4 displays the alternations caused by the tone circle on unstressed syllables. Since contour tones cannot appear on unstressed syllables, they are not shown in the table.

Table 4: The nominalizer tone circle on unstressed syllables (cf. Anderson 1962:369)

Isolation tone of unstressed syllable	Tone preceding nominalizer
1̣	5
1	3
2	2
3	1
4	5

For tone 1̣, the nominalizer tone circle has the same effect on an unstressed syllable as a stressed syllable: the syllable becomes tone 5 (69). (69b) shows that, in this environment, the nominalizer tone circle counterbleeds tone 1̣ dissimilation. I discuss this below.

(69) The nominalizer tone circle on unstressed syllables: Tone 1̣ (GE.DGG.20160806)

- a. Incorporated inalienable noun /\*a<sup>1</sup>/ 'mouth' word-finally:  
/na<sup>4</sup> = tʃo<sup>1</sup>-\*a<sup>1</sup>/ (3.Non1.SBJ.MC.A = be.white-\*NI:mouth) → [na<sup>4</sup>tʃo<sup>5</sup>o<sup>1</sup>] 'it has a white mouth'
- b. Becomes [a<sup>5</sup>] preceding Class IV nominalizer: /na<sup>1</sup> = tʃo<sup>1</sup>-\*a<sup>1</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>tʃo<sup>5</sup>o<sup>1</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that it has a white mouth'
- c. Incorporated inalienable noun /\*e<sup>3</sup>ja<sup>1</sup>/ 'sister' word-finally:  
/na<sup>4</sup> = pa<sup>1</sup>-\*e<sup>3</sup>ja<sup>1</sup>/ (3.Non1.SBJ.MC.A = smell.bad-\*NI:sister) → [na<sup>4</sup>pa<sup>1</sup>e<sup>3</sup>ja<sup>1</sup>] 'his/her sister smells bad'
- d. Becomes [e<sup>3</sup>ja<sup>5</sup>] preceding Class IV nominalizer: /na<sup>1</sup> = pa<sup>1</sup>-\*e<sup>3</sup>ja<sup>1</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>pa<sup>1</sup>e<sup>3</sup>ja<sup>5</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that his/her sister smells bad'

For tone 1, the nominalizer tone circle causes an unstressed syllable to become tone 3 (70). The phonotactics entail that all syllables in this position are monophthongs. Although stressed monophthongal tone 1 syllables reduplicate before becoming tone 3 in the tone circle, unstressed ones become tone 3 without undergoing any segmental change. (70a) illustrates this change with a disyllabic verb root, (70b) with a derived disyllabic stem.

(70) The nominalizer tone circle on unstressed syllables: Tone 1

- a. Isolation /i<sup>51</sup>ra<sup>1</sup>/ 'be small': /na<sup>4</sup> = i<sup>51</sup>ra<sup>1</sup>/ → [na<sup>4</sup>ʔi<sup>51</sup>ra<sup>1</sup>] 'it is small' (GE.LWG.20160806)
- b. Becomes [i<sup>51</sup>ra<sup>1</sup>] preceding Class IV nominalizer: /na<sup>1</sup> = i<sup>51</sup>ra<sup>1</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>ʔi<sup>51</sup>ra<sup>3</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that it is small' (GE.LWG.20160806)
- c. Incorporated alienable noun /\*gi<sup>1</sup>/ 'blood' word-finally:  
/na<sup>4</sup> = tʃo<sup>1</sup>-\*gi<sup>1</sup>/ (3.Non1.SBJ.MC.A = be.white-\*NI:blood) → [na<sup>4</sup>tʃo<sup>5</sup>gi<sup>1</sup>] 'it has white blood/sap' (GE.DGG.20160806)
- d. Becomes [gi<sup>3</sup>] preceding Class IV nominalizer: /na<sup>1</sup> = tʃo<sup>1</sup>-\*gi<sup>1</sup>-ʔi<sup>4</sup> = ka<sup>1</sup>/ → [na<sup>1</sup>tʃo<sup>5</sup>gi<sup>3</sup>ʔi<sup>4</sup>ka<sup>1</sup>] 'so that it has white blood/sap' (GE.DGG.20160806)

For tone 2, the nominalizer tone circle induces no change on unstressed syllables (71), just as it induces no change on stressed syllables.

(71) The nominalizer tone circle on unstressed syllables: Tone 2

- a. Isolation /tʃi<sup>31</sup>ʔe<sup>2</sup>/ 'be bad': /na<sup>4</sup> = tʃi<sup>31</sup>ʔe<sup>2</sup>/ → [na<sup>4</sup>tʃi<sup>31</sup>ʔe<sup>2</sup>] 'it's bad' (GE.KSC.20150714)

- b. Remains [tʃi<sup>31</sup>ʔe<sup>2</sup>] preceding Class IV nominalizer: /tʃi<sup>31</sup>ʔe<sup>2</sup>-ʔi<sup>4</sup>/ → [tʃi<sup>31</sup>ʔe<sup>2</sup>ʔi<sup>4</sup>] 'bad one(s) (Class IV)' (SSG, tsr 4:04)
- c. Clitic / = ʔi<sup>5</sup>tʃi<sup>1</sup>/ 'INTENS' word-finally: /na<sup>4</sup> = me<sup>43</sup> = ʔi<sup>5</sup>tʃi<sup>2</sup>/ (3.NonI.SBJ.MC.A = be.good = INTENS) → [na<sup>4</sup>me<sup>43</sup>ʔe<sup>5</sup>tʃi<sup>2</sup>] 'it was really good' (SSG, tsr 4:02)
- d. Remains [ʔe<sup>5</sup>tʃi<sup>2</sup>] preceding Class IV nominalizer: /me<sup>43</sup> = ʔi<sup>5</sup>tʃi<sup>2</sup>-ʔi<sup>4</sup>/ → [me<sup>43</sup>ʔe<sup>5</sup>tʃi<sup>2</sup>ʔi<sup>4</sup>] 'really good one (Class IV)' (LCS, tem 0:33)

While tones 1, 1, and 2 have the same behavior in stressed and unstressed syllables, tones 3 and 4 display different behavior. Recall that tone 3 becomes tone 2 on stressed syllables. On unstressed syllables, it becomes tone 1 (72).

(72) The nominalizer tone circle on unstressed syllables: Tone 3

- a. Isolation /ŋi<sup>2</sup>ma<sup>3</sup>/ 'forget': /na<sup>4</sup>ri<sup>3</sup> = ŋi<sup>2</sup>ma<sup>3</sup>/ → [na<sup>4</sup>ri<sup>3</sup>ŋi<sup>2</sup>ma<sup>3</sup>] 's/he forgets (it)' (GE.LWG.20160803)
- b. Becomes [ŋi<sup>2</sup>ma<sup>1</sup>] preceding Class IV nominalizer: /na<sup>1</sup>ri<sup>3</sup> = ŋi<sup>2</sup>ma<sup>3</sup>-ʔi<sup>4</sup>/ → (ni<sup>31</sup>ʔi<sup>3</sup>) [na<sup>1</sup>ri<sup>3</sup>ŋi<sup>2</sup>ma<sup>1</sup>ʔi<sup>4</sup>] '(I know that) s/he forgets it' (GE.LWG.20160803)
- c. Isolation /tʃi<sup>4</sup>ta<sup>3</sup>/ 'be night': /na<sup>4</sup> = tʃi<sup>4</sup>ta<sup>3</sup>/ → [na<sup>4</sup>tʃi<sup>4</sup>ta<sup>3</sup>] 'it is night' (GE.LCS.20150817)
- d. Becomes [tʃi<sup>4</sup>ta<sup>1</sup>] preceding Class IV nominalizer: /tʃi<sup>4</sup>ta<sup>3</sup>-ʔi<sup>4</sup>/ → [tʃi<sup>4</sup>ta<sup>1</sup>ʔi<sup>4</sup>] 'darkness' (GE.MFC.20150713)

Tone 4 becomes tone 1 in stressed syllables, but tone 5 in stressed syllables, merging with tone 1 (73).

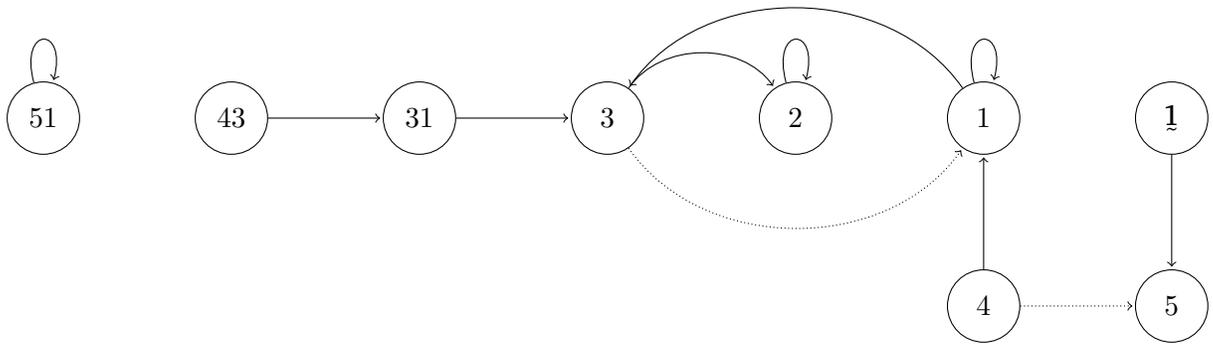
(73) The nominalizer tone circle on unstressed syllables: Ton 4

- a. Isolation /pu<sup>3</sup>ra<sup>3</sup>ki<sup>4</sup>/ 'work': /tʃa<sup>3</sup> = pu<sup>3</sup>ra<sup>3</sup>ki<sup>4</sup>/ (1SG.MC.A = work) → [tʃa<sup>3</sup>pu<sup>3</sup>ra<sup>3</sup>ki<sup>4</sup>] 'I am working' (GE.KSC.20150820)
- b. Becomes [pu<sup>3</sup>ra<sup>3</sup>ki<sup>5</sup>] preceding Class IV nominalizer: /tʃa<sup>1</sup> = pu<sup>3</sup>ra<sup>3</sup>ki<sup>4</sup>-ʔi<sup>4</sup>/ (1SG.SC.A = work-NMLZ:IV) → [tʃa<sup>1</sup>pu<sup>3</sup>ra<sup>3</sup>ki<sup>5</sup>ʔi<sup>4</sup>] '(I did not want) to work' (SSG, tsr 5:50)
- c. Clitic / = gi<sup>4</sup>/ 'PL' word-finally: /ta<sup>4</sup> = ja<sup>3</sup> = ma<sup>1</sup> = gi<sup>4</sup>/ (1INCL.SBJ.MC.I = 3.NonI.OBJ.MC.I = kill = PL) → [ta<sup>4</sup>ja<sup>3</sup>ma<sup>1</sup>gi<sup>4</sup>] 'we killed it' (GE.LWG.20160803)
- d. Becomes [gi<sup>5</sup>] preceding Class IV nominalizer: /∅ = ja<sup>3</sup> = ma<sup>1</sup> = gi<sup>4</sup>-ʔi<sup>4</sup>/ (1INCL.SBJ.SC.I = 3.NonI.OBJ.SC.I = kill = PL-NMLZ:IV) → [ja<sup>3</sup>ma<sup>5</sup>gi<sup>5</sup>ʔi<sup>4</sup>] '(I know that) we killed it' (GE.LWG.20160803)

As the examples above indicate, the nominalizer tone circle does not appear to have different effects on roots than on inalienable nouns and clitics.

(74) re-presents the graphical representation of the nominalizer tone circle from (68), now including the effects of the circle on unstressed syllables. Where a tone behaves differently in stressed and unstressed syllables, the change in stressed syllables is indicated by a solid line, while the change in unstressed syllables is indicated by a dashed line. (The dashing cannot fully represent the behavior of tone 1 due to the interactions of tone and syllable weight.)

(74) The nominalizer tone circle on stressed and unstressed syllables represented graphically



**The nominalizer tone circle and other phonology and morphology** The nominalizer tone circle interacts with two other processes: prosodically conditioned tone 1̣ dissimilation and the allomorphy of the Class IV nominalizer.

The interaction between the circle and prosodically conditioned tone 1̣ dissimilation occurs when a class nominalizer occurs on a verb stem that consists of a monosyllabic tone 1̣ verb root and a monosyllabic affix or clitic with tone 1 or 1̣. Schematically, a word formed in this way can be represented as /1̣-1-NMLZ/.

When a /1̣-1/ stem occurs with no nominalizer, the tone 1̣ root surfaces as tone 5 due to prosodically conditioned dissimilation (75a,b). When the same stem occurs with a nominalizer, the tone 1 or 1̣ bound morph undergoes the nominalizer tone circle, since it is the final syllable before the nominalizer. That is, if it is underlyingly tone 1̣, it becomes tone 5, and if it is underlyingly tone 1, it becomes tone 3. If dissimilation were ordered after the nominalizer tone circle, then in this environment, dissimilation would no longer apply to the tone 1̣ root. But in fact, the tone 1̣ root still dissimilates to tone 5 (75c,d). Thus, the nominalizer tone circle counterbleeds or is ordered after prosodically conditioned tone 1̣ dissimilation.

(75) Nominalizer tone circle counterbleeds prosodically conditioned tone 1̣ dissimilation (repeated from 69 and 70) (GE.DGG.20160806)

a. Tone 1̣ dissimilation applies to initial syllable in a non-nominalized /1̣-1̣/ stem:

$na^4tʃo^5o^1$

$na^4 =$

$tʃo^1 -a^1$

3.NonI.SBJ.MC.A = be.white- \*NI:mouth)

'it has a white mouth'

b. Tone 1̣ dissimilation applies to initial syllable in a non-nominalized /1̣-1/ stem:

$na^4tʃo^5gi^1$

$na^4 =$

$tʃo^1 -gi^1$

3.NonI.SBJ.MC.A = be.white - \*NI:blood

'it has white blood/sap'

c. Tone 1 dissimilation continues to apply to initial syllable when /1̣/ suffix becomes surface 5 due to nominalizer circle:

$na^1tʃo^5o^5ʔi^4ka^1$

$na^1 =$

$tʃo^1 -a^1$

$-ʔi^4$

$=ka^1$

3.NonI.SBJ.MC.A = be.white - \*NI:mouth -NMLZ:IV = PURP

'so that it has a white mouth'

- d. Tone 1 dissimilation continues to apply to initial syllable when /1/ suffix becomes surface 3 due to nominalizer circle:

$na^1tʃo^5gi^3ʔi^4ka^1$

$na^1 = \quad \quad \quad tʃo^1 \quad -gi^1 \quad -ʔi^4 \quad = ka^1$

3.NonI.SBJ.MC.A = be.white -\*NI:blood -NMLZ:IV = PURP

'so that it has white blood/sap'

The interaction between the circle and the allomorphy of the Class IV nominalizer occurs when a Class IV nominalization occurs as the last element of the utterance. For syntactic reasons, this is a token-frequent position for Class IV nominalizations in discourse. When a Class IV nominalization occurs utterance-finally, its final element, the Class IV nominalizer  $-ʔi^4$ , is reduced to only a word-final glottal stop (76). Although the TBU and tone of the nominalizer itself are deleted, the final syllable of the verb stem still undergoes the nominalizer tone circle. Note that deletion of word-final and utterance-final  $\tilde{i}$  is not a general phonological process, making this a case of allomorphy.

(76)  $-ʔ$  allomorph of Class IV nominalizer still triggers nominalizer tone circle

- a.  $/\eta u^1/$  'learn' is tone 1 in isolation:  $/na^4 = \eta u^1/ \rightarrow [na^4 \eta u^1]$  's/he is learning' (GE.LCS.20160714)
- b.  $/\eta u^1/$  'learn' becomes  $[\eta u^5]$  preceding unreduced allomorph of Class IV nominalizer:  $/na^1 = \eta u^1 - ʔi^4/ \rightarrow [na^1 \eta u^5 ʔi^4]$  '(I know that) s/he is learning' (GE.LCS.20160714)
- c.  $/\eta u^1/$  'learn' still becomes  $[\eta u^5]$  preceding reduced allomorph of Class IV nominalizer:  $/na^1 = \eta u^1 - ʔ/ \rightarrow [na^1 \eta u^5 ʔ]$  'is (s/he) learning?' (GE.MFC.20160802)

There are also other morphological processes which may interact with the nominalizer tone circle. These include truncation, which occurs in the vocatives of some nominalizations, and shifts of tone 1 to tone 5 conditioned by morphs other than nominalizers (§6.3.3).

### 6.3.3 More topics in morphologically conditioned phonology

This section sketches topics in morphologically conditioned phonology which I cannot describe in full due to lack of data. I begin with topics specific to the nominalizer tone circle, then continue to larger tonological issues.

First, there are several outstanding empirical questions about the nominalizer tone circle. The simplest relates to the behavior of transitive verbs in the circle. I mentioned in §6.3.2 that in the tone frame recordings, I asked the consultant to produce the object of all transitive verbs as a free word preceding the verb. This is because, in a nominalized subordinate clause where (a) the verb has a third person subject and object; (b) the object is not expressed as a free word, and (c) neither the subject nor the object noun is Class I, the verb must bear an enclitic  $= ʔa^1$  '3.NonI.SBJ>3.NonI.OBJ.SC' between the last element of the stem and the nominalizer. Because this element always occurs adjacent to a nominalizer, it is impossible to know how it is affected by the nominalizer tone circle. It is clear, however, that  $= ʔa^1$  has effects on the final syllable of the verb stem which are different from the effects of the nominalizer tone circle. For example,  $= ʔa^1$  causes an immediately preceding tone 4 stressed syllable to become tone 5, as shown with examples from the tone frame recordings in (77). More data is necessary about the effects of this affix on monosyllabic verb roots of other tones, non-monosyllabic verb roots, and non-verb root morphs.

- (77)  $-a^1\eta^3$  3.SBJ>3.OBJ.SC causes tone 4 > tone 5
- Isolation  $/\eta e^4/$  'take something into the hands':  
 $/na^4 = na^3 = \eta e^4/ \rightarrow [na^4na^3\eta e^4]$  's/he takes it in hand'
  - Becomes  $[\eta e^1]$  preceding Class IV nominalizer:  
 $(po^3pe^3ra^1) /ja^1 = \eta e^4 - \eta^4 = ka^1/ \rightarrow [ja^1\eta e^1\eta^4ka^1]$  'so that s/he takes the book in hand'
  - Becomes  $[\eta e^5]$  preceding 3.SBJ>3.OBJ.SC element:  
 $/ja^1 = \eta e^4 - a^1 - \eta^4 = ka^1/ \rightarrow [ja^1\eta e^5a^1\eta^4ka^1]$  'so that s/he takes it in hand'

It is also still unclear to me exactly which morphs trigger the nominalizer tone circle. I have listed above that all four of the class nominalizers,  $=\eta^1ra^1$  DEINTENS, and  $=\eta a^3ka^1$  'smell/taste' induce the tone circle. I also have data indicating that the directional affix  $-e^3$  'DIR:across/down/to.water' and the pluractional affix  $-e^3$  -- both homophonous with the Class I nominalizer -- induce at least the tone 1 to tone 5 change of the tone circle (78). The data is not sufficient, though, to determine whether all of these morphs induce exactly the same changes on the preceding syllable as would be found in the nominalizer tone circle. My impression from texts, for example, is that the  $-e^3$  pluractional does not induce all of the same changes as the nominalizers.

- (78)  $-e^3$  directional and  $-e^3$  pluractional induce 1 > 5
- Isolation  $/t\eta o^1/$  'be white':  
 $/na^4 = t\eta o^1/ \rightarrow [na^4t\eta o^1]$  'it is white' (GE.LWG.20160801)
  - Becomes  $[t\eta o^5]$  preceding  $-e^3$  pluractional:  
 $/na^4 = t\eta o^1 - e^3/ \rightarrow [na^4t\eta o^5e^3]$  'they are white' (GE.LWG.20160801)
  - Isolation  $/ta^1/$  'discard, nonpluractional':  
 $/i^5 = na^4 = na^3 = ta^1/ \rightarrow [i^5na^4na^3ta^1]$  's/he discards it' (GE.LCS.20150817)
  - Becomes  $[ta^5]$  preceding  $-e^3$  directional:  
 $/tja^3 = na^3 = ta^1 - e^3/ \rightarrow [tja^3na^3ta^5e^3]$  'I soak it; I leave it in water'

There is also a much larger open question on the nominalizer tone circle: what to make of the empirical overlap between prosodically conditioned tone 1 dissimilation and the behavior of tone 1 in the circle. Recall from §6.2.4 that tone 1 becomes tone 5 both when it occurs before another tone 1 syllable within a foot -- schematically,  $F[_1]$  -- and when it is subject to the nominalizer tone circle. This raises the question of whether prosodically conditioned dissimilation and the nominalizer circle are actually different phenomena, or are examples of the same alternation triggered by different environments. If they are disjoint phenomena, there is no prediction that syllables which are not tone 1 will undergo alternations in the  $F[_1]$  environment. If the two phenomena are the same, on the other hand, it is predicted that syllables of other tones will undergo the same alternations  $F[_1]$  as when they are subject to the nominalizer tone circle. I have not systematically collected data on whether this is the case. Data in Anderson (1962) and a set of tone frame recordings which I made in 2015, however, indicates that the tone 43 of the default possessor morpheme becomes 31 -- as the nominalizer tone circle -- whenever it appears on an inalienably possessed noun with initial tone 1 or 1, that is  $F[_1]$ . Likewise, tone 31 monosyllabic pronouns become 3, as in the nominalizer tone circle, when they precede case markers with tone 1 (§11.2). Further data is necessary to determine whether this is a morphologically specific phenomenon, or whether the same alternations found in the nominalizer tone circle actually occur on all morphemes in the  $F[_1]$  environment.

If additional data shows that the alternations of the  $F[_1]$  environment and the nominalizer tone circle are the same, it becomes possible to give a very simple analysis for both phenomena. I

will refer to this candidate analysis, borrowing a term from the literature on Oto-Manguean tone systems (beginning with Mak 1953), as the 'perturbation' analysis. Under this analysis, every level and contour tone has exactly two allotones: the isolation allotone and the perturbed allotone. The perturbed allotone of a tone occurs when the tone either (a) appears in the  $F[_1]$  environment or (b) precedes a morpheme that is lexically marked as causing perturbation. (It is also notionally possible that (c) perturbation could be the sole marker of a morphological category.) In all other environments, the isolation allotone occurs. The relationship between an isolation tone and its corresponding perturbed tone, under this analysis, is like the relationship between two segments subject to consonant mutation in a language, such as Modern Irish, which displays consonant mutations that cannot be expressed with a single phonological rule. That is, knowing the isolation tone of a syllable allows the speaker to predict the perturbed tone of that syllable, but it does not necessarily allow her to predict the perturbed tone of a syllable with a different isolation tone.

It is also possible to restate the perturbation analysis in terms of floating tones. On the floating tone version of the analysis, perturbation is not morphologically conditioned. Instead, it is always caused by the presence of tone 1. In the  $F[_1]$  environment, the triggering tone 1 is linked to the second syllable of the foot. In environments with apparent morphological conditioning, the tone 1 is a floating tone at the left edge of the triggering morph. The analysis is tempting when stated in these terms, but it incorrectly predicts that morphs with linked tone 1 will cause perturbation wherever they appear in the word. This is incorrect: linked tone 1 has no effect on neighboring tones except within a foot (§6.2.4).

We can perhaps save the floating tone analysis by turning to morphological diacritics. Suppose we place two diacritics on morphs which cause perturbation on the preceding syllable. These morphs (a) have a left-edge floating tone 1 and (b) have a morphologically specific requirement that they must be preceded by the head of a foot. The morphologically specific metrical requirement causes the final syllable of the stem and the first syllable of the affix to be parsed as a foot. The floating tone 1 of the affix then creates the  $F[_1]$  environment for perturbation. Perturbation applies, and finally the floating tone 1 is deleted. (79) shows a derivation of the surface form in (75d), with cyclic application of perturbation, under this analysis.

(79)	Derivation of $na^1 = tʃo^5gi^3ʔi^4ka^1$ 'so that it has white blood/sap' (GE.DGG.20160806) on floating tone analysis	
	Underlying	$na^1 = tʃo^1-gi^1-1ʔi^4 = ka^1$
	Metrical parse	$(na^1) = (tʃo^1-gi^1)-1ʔi^4 = ka^1$
	Perturbation	$(na^1) = (tʃo^5gi^1)-1ʔi^4 = ka^1$
	Metrical parse	$(na^1) = (tʃo^5)(gi^1-1ʔi^4) = ka^1$ Required by metrical diacritic on $-1ʔi^4$
	Perturbation	$(na^1) = (tʃo^5)(gi^3-1ʔi^4) = ka^1$
	Delete unlinked tones	$(na^1) = (tʃo^5)(gi^3-ʔi^4) = ka^1$
	Surface	$[na^1tʃo^5gi^3ʔi^4ka^1]$

I reject the floating tone analysis for three reasons. First, the floating tone analysis is not more parsimonious than the straightforward morphological conditioning analysis. It simply replaces one kind of diacritic on morphs that cause perturbation with two kinds of diacritics, the floating tone 1 (which is never realized) and the morphologically specific metrical rule. Second, the floating tone analysis cannot account for examples, like (76c), in which the morph that causes perturbation cannot be footed (because it has no vowel) but perturbation still applies. These examples could be accounted for if the selection of the  $-ʔ$  allomorph of  $-ʔi^4$  occurred after the second metrical parse. This is not motivated, though, since the alternation between the  $-ʔi^4$  and  $-ʔ$  allomorphs

of this morph is clearly a matter of morphology and not of phonology (above). Third, it is not clear how the morphologically specific metrical rule in the floating tone analysis could derive the differences between stressed and unstressed tone 3 and 4 syllables in the tone circle.

### 6.3.4 Phenomena that could be viewed as morphologically conditioned phonology

Besides the nominalizer tone circle, there is another tone phenomenon in subordinate clauses which could potentially be interpreted as morphologically conditioned phonology. This phenomenon comes from the tone behavior of subject proclitics. For verb stems of all classes, subject proclitics typically have a tone that is lower in subordinate clauses than in main clauses. This is true both in clauses subordinated by nominalizers and in those subordinated by morphs which do not induce the nominalizer tone circle. (80) exemplifies this generalization for the subject proclitics of the *a*-class, which is the largest class of verbs.

- (80) Main clause vs. subordinate clause subject proclitic paradigms for the intransitive *a*-class verb  $\eta u^1$  'learn'

Subject Features	Main Clause	Purpose Clause	Gloss
1SG	$tʃa^3 = \eta u^1$	$tʃa^1 = \eta u^5 - \eta i^4 = ka^1$	'(so that) I learn'
2SG	$ku^3 = \eta u^1$	$ku^1 = \eta u^5 - \eta i^4 = ka^1$	'(so that) you learn'
3.II/III/IV	$na^4 = \eta u^1$	$na^1 = \eta u^5 - \eta i^4 = ka^1$	'(so that) s/he (Class II/IV) learns'
3.I	$ta^4 = \eta u^1$	$ta^2 = \eta u^5 - \eta i^4 = ka^1$	'(so that) s/he (Class I) learns'
3.F	$i^4 = \eta u^1$	$na^1 = \eta u^5 - \eta i^4 = ka^1$	'(so that) she (Class I skewed) learns'
3.II/III/IV previously mentioned	$na^4 = \eta u^1$	$\emptyset = \eta u^5 - \eta i^4 = ka^1$	'(so that) that one (Class II/IV) learns'
3.I previously mentioned	$ta^4 = \eta u^1$	$\emptyset = \eta u^5 - \eta i^4 = ka^1$	'(so that) that one (Class I) learns'
1INCL (1 + 2)	$ta^4 = \eta u^1$	$i^2 = \eta u^5 - e^3 - \eta i^4$	'(so that) you and I learn'
1EXCL (1 + 3, 1 + 2PL)	$ta^3 = \eta u^1$	$ta^2 = \eta u^5 - e^3 - \eta i^4 = ka^1$	'(so that) you pl/she and I learn'
2PL	$pe^3 = \eta u^1$	$pe^2 = \eta u^5 - e^3 - \eta i^4 = ka^1$	'(so that) you all learn'
3PL	$na^4 = \eta u^5 - e^3$	$na^1 = \eta u^5 - e^3 - \eta i^4 = ka^1$	'(so that) they learn'

In (80), seven of the eleven rows in the paradigm have lowering of the tone of the subject proclitic, but no segmental change, in subordinate clauses. Yet there are also rows in the paradigm where the subject proclitic undergoes a different change in subordinate clauses. For 3F and 1INCL subjects, the proclitic undergoes a segmental change in addition to a tone change (in the 1INCL cell) or instead of one (in the 3F cell). And for subjects previously mentioned in the discourse, the proclitic of a main clause is identical to the proclitic for a non-demonstrative subject of the same noun class, but in a subordinate clause, the subject proclitic is zero.

Patterns similar to this obtain for the subject proclitics of transitive *a*-class verbs and for the other verb classes: most subject proclitics undergo only lowering of tone in subordinate clauses, but some also undergo unpredictable segmental changes, and others delete. Therefore, it is most accurate to describe subordination as having tripartite multiple exponence. One part of the exponence of subordination, for verbs with subjects of certain features, is lowering the tone of the subject proclitic; another part of the exponence, for other subject features, is change in the segments of the proclitic; and a third part is the presence of a morphological subordinator.

Noun class agreement on nominal deictics (§9.1.1) and the contrast between nominal and locative deictics (§11.1.8) are both primarily marked by tone. These phenomena could also be considered morphologically conditioned phonology.

## 6.4 The phonology of glottal stop

The distribution of glottal stop in CT is governed by a large number of factors. In some environments, it is underlying. In others, it is predictable, fulfilling a requirement for an onset in certain phonological and morphological positions. (81) states the distribution of glottal stop in brief form, and its generalizations are explained in greater detail below. In (81), 'word' refers to the morphological word.

- (81) Generalizations about the distribution of glottal stop
- a. Word-initially, glottal stop does not appear.
  - b. Word-finally, glottal stop appears and is contrastive. However, word-final glottal stop is also always the sole segment of an affix. There are no underived words with final glottal stop, and no affixes with final glottal stop and other segmental content.
  - c. Word-medially in coda, glottal stop appears and is contrastive.
  - d. Word-medially in onset:
    - i. Contrastive glottal stop appears as the initial segment of a morph.
    - ii. Contrastive glottal stop appears in a tautomorphemic sequence of vowels with a level or falling tone melody.
    - iii. Glottal stop is epenthesis to resolve hiatus between the final vowel of a subject agreement proclitic and a vowel-initial verb root.
    - iv. Glottal stop is epenthesis to resolve hiatus in a tautomorphemic sequence of vowels with a rising tone melody.

### 6.4.1 Word-initial glottal stop

There is no evidence for glottal stop as the first segment of a morphological word. All vowel-initial words display similar onsets of the vowel, with no contrast between a simple onset and an onset preceded by glottal stop. This includes vowel-initial verb roots cited in isolation, even though such verb roots display an initial glottal stop when they follow a subject proclitic (§6.4.5).

### 6.4.2 Word-final glottal stop

Word-final glottal stop appears in two morphological constructions. First, word-final glottal stop is the affixal part of one of CT's two vocative constructions. In this construction, the vocative noun (a) is preceded by the vocative element  $pa^2$  and (b) bears a glottal stop affix (82).

- (82) Word-final glottal stop in vocative construction
- a. Isolation  $*ne^3$  'son': /tʃau<sup>1</sup>- $*ne^3$ / (1SG- $*son$ ) → [tʃau<sup>1</sup>ne<sup>3</sup>] 'my son'
  - b. Vocative:  $pa^2$  tʃau<sup>1</sup>ne<sup>3</sup>? 'Son!' (GE.SSG.20160726)

Second, word-final glottal stop is an allomorph of the Class IV nominalizer  $-ʔ̃^4$ , discussed at length in §6.3.2. The final vowel of this nominalizer is optionally deleted when it appears utterance-finally, giving the allomorph  $-ʔ$ . If any word (including a quotative, which seems to form a separate intonational phrase from the quotation which it licenses) appears following the Class IV nominalizer, the vowel reappears (83). Note that, while the Class IV nominalizer has no *segmental* content other than glottal stop in (83a), it does have other *phonological* content, as it imposes allotony on the final syllable of the verb stem.

(83) Word-final glottal stop exponing Class IV nominalizer

- a.  $/-ʔ̃^4/$  allomorph utterance-finally:  $/na^1 = \eta u^1 - ʔ̃^4/$  (3.Non1.SBJ.SC.A = learn-NMLZ:IV) →  $[na^1 \eta u^5 ʔ̃^4]$  '(I know that) s/he is learning' (LCS 2016 p 69 X)
- b.  $/-ʔ/$  allomorph utterance-finally:  $/na^1 = \eta u^1 - ʔ/$  (3.Non1.SBJ.SC.A = learn-NMLZ:IV) →  $[na^1 \eta u^5 ʔ]$  'is (s/he) learning?' (MFC 2016 p 142 X)

Anderson (1962:xix) claims that glottal stop appears predictably following word-final tone  $\underline{1}$  vowels. My phonetic analysis of tone  $\underline{1}$  vowels (Skilton 2016, 2017) shows that non-tone  $\underline{1}$  word-final vowels are actually phonetically breathy for the last (roughly) 25% of the time course of the vowel. Tone  $\underline{1}$  word-final vowels, on the other hand, are phonetically creaky for this portion of the time course. The final creaky portion of of tone  $\underline{1}$  vowels could be interpreted as a pharyngeal approximant rather than a vowel, since its intensity is very low. But as there is still phonation, it is not a canonical glottal stop.

Besides in these two constructions, glottal stop never surfaces as the final segment of a word.

### 6.4.3 Word-medial coda glottal stop

Word-medial coda glottal stop is contrastive. It can appear both within morphs and as the first segment of bound morphs, including inalienably possessed nouns, affixes, and clitics. (84) provides examples of word-medial coda glottal stop in underived words with a variety of tone patterns. (85) provides examples demonstrating the contrast in bound morphs between initial C and initial  $\text{ʔC}$ .

(84) Word-medial coda glottal stop in underived words

- a. Rising tone melody:  $ta^2 ʔre^4$  'two' (cf.  $ta^3 ra^5$  'machete')
- b. Level tone melody:  $de^4 ʔtʃi^4$  'fish sp (*Arapaima* sp.)' (cf.  $pa^4 wi^4$  'spider, generic')
- c. Falling tone melody:  $ki^3 ʔtʃi^1$  'knife' (cf.  $pi^3 tʃa^1$  'fishing net'; both are loans < TG)

(85) Minimal pairs of bound morphs with initial  $\text{ʔC}$  vs. initial C

- a.  $na^{43} - *ʔti^4$  (DEF.POSS-\*WF/HF) 'father-in-law' vs.  $na^{43} - *ti^4$  (DEF.POSS-\*river) 'river'
- b.  $-ʔgu^2$  'subordinator: temporal overlap subordinate clause' vs.  $=gu^2$  'locative case'
- c.  $na^{31} - *ʔne^1$  (DEF.POSS-\*CLF:weapon) 'weapon' vs.  $na^{31} - *ne^1$  (DEF.POSS-\*CLF:tree.trunk) 'tree trunk'

### 6.4.4 Word-medial onset glottal stop: underlying sources

Word-medial onset glottal stops come from four sources. Two sources are unpredictable, while the other two are predictable based on the pairing of morphological and phonological context.

I begin with the two underlying sources of glottal stop. First, in nouns and adverbs and within verb stems, a glottal stop which appears between two *heteromorphemic* vowels is always underlying and always belongs to the second morpheme in the sequence. This reflects that initial glottal stop is contrastive in bound morphs. (86) provides examples of bound morphs with initial  $\text{ʔV}$  sequences, compared to bound morphs with the same initial vowel and a similar tone, but no glottal stop.

- (86) Near-minimal pairs of nonfirst morphs with initial  $\text{ʔV}$  vs. initial V
- a.  $na^4-ʔe^4ti^1$  (3.III/IV-*\*space.above*) 'its upper surface; the space above him/her/it' vs.  $na^4-e^4$  (3.III/IV-*\*mother*) 'his/her mother'
  - b.  $na^4-ʔa^3ki^1$  (3.III/IV-*\*daughter*) 'his/her daughter' vs.  $na^4-a^4ne^4$  (3.III/IV-*\*WB/ZH*) 'his/her brother-in-law'

Second, *tautomorphemic* VV sequences contrast with V $\text{ʔV}$  sequences when there is a level or falling tone melody over the two vowels involved. (87) provides pairs of morphs with the same tones demonstrating this contrast. This contrast is marginal in two ways: (a) there are relatively few VV sequences with falling and level melodies, and (b) many, although not all, VV words are loanwords. Note, for example, that the VV morphs in (87a,b) are loanwords.

- (87) Near-minimal pairs of morphs with V $\text{ʔV}$  vs. VV and falling melodies
- a.  $u^3i^1$  'toasted manioc' vs.  $pa^3ʔa^1$  'quickly'
  - b.  $pa^4ũ^2$  'bread' vs.  $\eta\tilde{a}^4\tilde{\eta}^2$  'be drunk, be full, nonpluractional'
  - c.  $ja^4a^2$  'DNOM.PROX:IV' vs.  $na^43-ta^4ʔa^2$  'ChCh/BCh/ZCh/MBCh'

#### 6.4.5 Word-medial onset glottal stop epenthesis: proclitic-verb root hiatus

In the verb complex, glottal stop is epenthesized to resolve *heteromorphemic* hiatus between the subject/object proclitic group and the verb root. All subject and object proclitics are vowel-final. Therefore, in a vowel-initial verb that bears proclitics, there is always hiatus between the final vowel of the proclitic string and the initial vowel of a vowel-initial verb root. Glottal stop is epenthesized to resolve this hiatus (88). The glottal stop is epenthetic because it is absent from the citation and nominalized forms of verb roots, as well as from subject and object proclitics preceding consonant-initial verb roots.

- (88) Glottal stop epenthesized to resolve hiatus between subject/object proclitics and verb root
- a. Proclitic and root of same tone:  $na^4=na^3=ʔ\tilde{a}^3$  (3.NonI.SBJ.MC.A-3.NonI.OBJ.MC.A-give.A) 'she/he/they give it' (cf.  $\tilde{a}^3$  'gift')
  - b. Proclitic lower tone than root:  $tʃi^1=ʔu^2-\tilde{\eta}^2=kq^1$  (1SG.SBJ.MC.I-say-NMLZ = PURP) 'so that I say (it)' (cf.  $u^3$  'speech') (GE.MFC.20160726)
  - c. Proclitic higher tone than root:  $na^4=ʔa^1$  (3.NonI.SBJ.MC.A-sing.bird) 'it sings, speaking of a bird'

As (88) illustrates, this process is insensitive to the tones of the proclitics and of the verb root. It is also insensitive to whether the hiatus to be resolved involves a subject proclitic (88b, c) or an object proclitic (88a).

Two topics related to this process require further research. First, in some morphological contexts, it is possible for hiatus to arise between a pre-proclitic and a subject or object proclitic. Elicitation is necessary to determine whether hiatus in this position is also resolved by glottal stop epenthesis. Second, in attributive and other verbless clauses, subject proclitics can appear on nouns. More elicitation is necessary to determine how hiatus between subject proclitics and non-verbal predicates is resolved. My impression from tokens in texts, however, is that glottal stop is also epenthesized in these contexts.

#### 6.4.6 Word-medial onset glottal stop epenthesis: tautomorphemic hiatus

Glottal stop is also epenthesized in some *tautomorphemic* contexts. Specifically, glottal stop predictably occurs in any tautomorphemic VV sequence with a rising tone melody: that is, between two tautomorphemic vowels in which the tone of the second vowel is higher than the tone of the first vowel. The glottal stops epenthesized by this process appear as spectral zeros only when speakers are speaking extremely slowly. In running speech, they are realized as laryngealization or are not realized at all. Impressionistically, the more similar the tones of the vowels in hiatus, the less likely that an epenthetic glottal stop is actually realized in running speech.

(89) provides examples of lexical items of the surface form [(C)V?V] which exemplify this process. Because of the process, there are no roots of the surface form [(C)VV] where the tone of the second vowel is higher in tone than the first. (92) shows that the process does not occur in heteromorphemic rising melody VV sequences, regardless of the morphological affiliation of the vowels.

- (89) Glottal stop epenthesized in tautomorphemic VV sequence with tone of V2  $\geq$  2 levels higher than level tone of V1
- a. 12:  $t\acute{1}ʔe^2$  'manioc'
  - b. 13:  $\tilde{l}^1ʔe^3$  'blowgun'
  - c. 13:  $tfe^1ʔe^3$  'tree sp'
  - d. 14:  $ja^1ʔi^4$  'squirrel sp'
  - e. 15:  $o^1ʔi^5$  'old man, grandfather'
  - f. 23:  $iʔi^3$  'fire; fuel (firewood, gas, gasoline)'
  - g. 24:  $o^2ʔ\delta^4$  'newborn baby'
  - h. 34:  $no^3ʔ\epsilon^4$  'tree sp'
  - i. 35:  $po^3ʔi^5$  'plantain'
  - j. Unattested root shapes:  $*V^1V^3$ ,  $*V^1V^4$ ,  $*V^2V^4$ , etc.

If the first syllable of the word bears a 31 contour tone, glottal stop is epenthesized only if the second syllable in hiatus bears tone 4 or 5 (90a,b). It is not epenthesized if the second syllable has tone 3 (90c). This could be taken as evidence that the final tone in tone 31 is actually tone 2 and not tone 1.

- (90) Glottal stop epenthesized in tautomorphemic VV sequence with contour tone 31 on V1 and level tone 4 or 5 on V2
- a. 31.4:  $ta^{31}ʔi^4$  'fruit sp, *Pouteria caimito*'

- b. 31.5:  $de^{31}\eta a^5$  'water'
- c. No epenthesis in 31.3:  $\eta u^{31}e^3$  'canoe'
- d. Unattested root shapes:  $*V^{31}V^4$ ,  $*V^{31}V^5$

If the first syllable has tone 43, glottal stop is epenthesized if the second syllable bears tone 4 (91). There are no words in my lexicon with the tone melody 43.5 and hiatus. Tone 51 does not occur in disyllables with a rise on the second syllable (§4.5.2).

(91) Glottal stop epenthesized in tautomorphic VV sequence with contour tone 43 on V1 and level tone 4 on V2

- a. 43.4:  $wi^{43}\eta i^4$  'one'
- b. 43.4:  $na^{43}\eta i^4$  'fibers of *Astrocaryum chambira* tree'

(92) shows that glottal stop is not epenthesized to resolve hiatus with a rising melody when the vowels involved in the hiatus are heteromorphic.

(92) Glottal stop not epenthesized in heteromorphic VV sequence with rising melody

- a. Possessor-Possessum:  $/t[au^1\text{-}e^5ga^1/$  (1SG- \*name)  $\rightarrow$   $[t[au^1e^5ga^1]$  'my name'
- b. Possessor-Possessum:  $/to^1\text{-}a^5ti^1/$  (other- \*leaf)  $\rightarrow$   $[to^1o^5ti^1]$  'leaf of another (one)' (GE.DGG.20160803)
- c. Verb Root-Incorporate:  $/na^4 = t[\text{ø}^1\text{-}a^5ti^1/$  (3.NonI.SBJ.MC.A-be.white- \*NI:leaf)  $\rightarrow$   $[na^4t[\text{ø}^1o^5ti^1]$  'its leaves are white' (GE.DGG.20160805)
- d. Verb Root-Directional:  $/i^5 = t[a^3ri^3 = to^1\text{-}\tilde{a}^4ti^4/$  (DIR = 1SG.SBJ.MC.RI = sit-DIR:round.trip)  $\rightarrow$   $[i^5t[a^3ri^3to^1\tilde{o}^4ti^4]$  'I went and sat (then returned) / I sat briefly' (GE.DGG.20160803)

#### 6.4.7 Glottal stop alternations in certain verb roots

A residual issue in the phonology of glottal stop involves alternations between root allomorphs with medial and with final glottal stop in a subset of monosyllabic verb roots. The roots involved in this alternation display two shapes. When they do not bear affixes, or when they are affixed only with nominalizers, they have the disyllabic form (C)V<sub>1</sub>?V<sub>1</sub>, (C)a?u, or (C)a?i, and they bear either tone 1 or tone 3 on the second syllable. When these roots bear an incorporate, a verbal affix other than a nominalizer, or an enclitic, they display the form (C)V? (for (C)V<sub>1</sub>?V<sub>1</sub> roots) or Cai? or Cau? (for (C)a?u and (C)a?i roots). These glottal stop-final allomorphs have the tone of the first syllable of the (C)V?V form.

(93) provides examples of this allomorphy with the root  $ja^2\eta u^3 \sim jau^2$  'receive, accept; grab; trap.' Other verb roots which undergo the alternation include  $ku^{31}\eta u^3 \sim ku^{31}?$  'kick,'  $ja^1\eta u^3 \sim jau^1?$  'wash' (a minimal pair with 'receive'), and  $k^w a^{31}\eta i^3 \sim k^w ai^3?$  'hit with swinging motion.' There are a total of 16 roots which undergo the alternation in my lexicon.

(93) CV?V  $\sim$  CVV? alternation in the verb root  $ja^2\eta u^3$

- a. CV?V without affixes:  $tfa^3 = na^3 = ja^2\eta u^3$  (1SG.SBJ.MC.A = 3.NonI.OBJ.MC.A = grab.A) 'I grab it' (GE.LCS.20150814)
- b. CV?V with nominalizer:  $ja^2\eta u^3\text{-}\eta i^4$  (grab-NMLZ:IV) 'one (Class IV) who receives (i.e. welcomes)' (DGG, dbu 0:58)

- c. CVV? with non-nominalizer affix/clitic:  $na^4 = jau^2? = gi^4$  (3.NonI.SBJ.MC.A = grab = PL)  
'they receive' (DGG, puc 0:57)

There are many roots which are similar in vowel melody and tone to the CVV? form of the alternating roots, but do not alternate. These include  $du^{31}$  'bleed' (cf.  $du^{31?} \sim du^{31?}u^3$  'sip, slurp'),  $dau^2$  'see' (cf.  $jau^2?$  'receive'), and  $tai^2$  'be hard' (cf.  $k^{w}ai^3?$  'hit'). This eliminates an account of the alternation in (93) as arising from prosodic minimality requirements.

Instead, I propose that the alternating roots have the underlying form (C)V? and appear in the CV?V form in isolation because of a constraint against word-final glottal stop in non-derived environments. When these roots appear in isolation, to avoid violation of this constraint, a second syllable is epenthesized on the syllabic tier. If the root nucleus is a monophthong, the epenthesized syllable is given segmental content by copying the vowel of the underlyingly monosyllabic root. If it is a diphthong, the epenthetic syllable is filled by breaking the association between the second vowel of the root on the CV tier and the syllable which dominates the root on the syllabic tier. The second vowel of the root is then reassigned with the epenthetic syllable.<sup>5</sup>

Whether the epenthetic syllable is filled by copied or by diphthong material, it is assigned 3 tone as a default tone. (§4.2.5 provides converging evidence from loanword phonology that 3 is the default tone.) There are some verbs which undergo the glottal stop alternation which instead have tone 1 on the second syllable in the CV?V form, such as  $de^4?e^1 \sim de^4?$  'be yellow' and (again)  $gau^5\tilde{a}^1 \sim gau^5?^1$  'tear'. I propose that these verbs respectively have the underlying tone melodies 41 and 51. In  $de^4?e^1$ , the tone 1 is deleted in the CV? form because of the ban on 41 contours on lexical morphs. In  $gau^5\tilde{a}^1$ , on the other hand, the tone 1 survives in the CV? form as part of a contour on the single syllable, since tone 51 is licit on lexical morphs.

This analysis has the advantages of explaining (a) why all verb roots which participate in the alternation have a vowel sequence which can potentially be parsed as monosyllabic, (b) why the form of the disyllabic allomorph of alternating verbs is partially phonologically predictable, and (c) why only some monosyllabic verb roots alternate. Its main disadvantage is that it does not explain why nominalizers trigger the disyllabic allomorph when all other affixes and clitics trigger the monosyllabic allomorph. It could be argued, from the nominalizer tone circle (§6.3.2), that nominalizers do not belong to the same prosodic domain as other verbal affixes and clitics. This could also explain their behavior in the glottal stop alternation.

## 7 Word classes

### 7.1 Definitions of word classes

CT displays three open word classes and two closed classes. The open word classes are nouns, verbs, and adverbs. By saying these classes are 'open,' I mean that it is possible to morphologically derive words of one open class from those of another open class. The closed classes are interjections and noun class particles. I classify into word classes here only phonologically free words and inalienably possessed nouns. Although CT has many clitics which arguably express lexical content, I do not attempt to assign clitics to word classes.

<sup>5</sup>There is a single root with the glottal stop alternation that does not obey this pattern,  $gau^5?^1$  'tear'  $\sim gau^5\tilde{a}^1$  (not  $\sim *ga^5?u^1$ ). The exceptional behavior of this root could be related to its 51 tone: perhaps the length of a diphthong is necessary to realize tone 51 preceding a glottal stop.

The closed classes are defined as follows. Noun class particles are phonologically free, monosyllabic words which occur within the noun phrase. They fusionally expone (a) the noun class of the noun which heads the noun phrase and (b) the tense-modality-evidentiality (TME) value of the clause. Because noun class particles are part of the noun class agreement system, I describe them in greater detail in §9.1.4.

Interjections are words which make up an entire utterance and bear no morphology. They are typically disyllabic or trisyllabic. Many interjections have directive force -- e.g. *di<sup>1</sup>?ka<sup>4</sup>* 'look!, wow!, pay attention!' and *be<sup>1</sup>?ma<sup>2</sup>* 'be quiet!' -- but some, like the continuer *o<sup>2</sup>?ē<sup>1</sup>?na<sup>5</sup>* 'really?,' do not. A handful of interjections are morphologically similar to verbs or adverbs, but there is no productive process which derives interjections from other word classes.

Adverbs are the smallest of the open word classes. They are free words, typically disyllabic, which can act as adjuncts to a verb phrase or entire clause without bearing any additional morphology. Since some nouns can also modify a clause without bearing morphology, an additional clause is necessary to define adverbs: adverbs cannot participate in possessive constructions, act as arguments, or take case. The class of adverbs includes manner adverbs, temporal adverbs, and conjunctions. Manner adverbs such as *pa<sup>3</sup>?a<sup>1</sup>* 'quickly' modify a verb phrase and express the manner in which the event of the verb took place. Temporal adverbs such as *ī<sup>3</sup>pa<sup>3</sup>* 'long ago' likewise modify the verb phrase. Conjunctions are free words which express the logical, information-structural, or temporal relationship between clauses. They include elements such as *wo<sup>5</sup>o<sup>4</sup>* 'although, despite,' *na<sup>1</sup>tī<sup>4</sup>ri<sup>1</sup>* 'but,' and *e<sup>3</sup>ri<sup>4</sup>* (NPST) ~ *je<sup>4</sup>ri<sup>4</sup>* (PST) 'because.' Adverbs can be productively derived with the adverbializing clitic = *ā<sup>1</sup>ki<sup>2</sup>*.

Nouns have three distinguishing properties. First, they can act as arguments of a predicate without undergoing any additional derivation. Second, as a result of their argument status, nouns can take case marking. Third, nouns can participate as the possessor or possessum in a possessive construction. Nouns fall into two overarching morphological form classes: alienably possessed nouns and inalienably possessed nouns. Alienably possessed nouns are prosodically independent words, while inalienably possessed nouns behave as clitics. The class of nouns is divided in many ways: by form class, by agreement class, and by animacy (§8.1). Nouns can be productively derived from verbs with nominalizers.

Verbs have two distinctive properties. They can take subject and object proclitics without any additional derivation, and they can bear subordinating morphology, such as nominalizers and the temporal overlap subordinator. Property concepts are lexicalized as stative verbs. There is no morphological class of adjectives, although verbs which denote time-stable property concepts have some unique morphosyntactic properties. Many concepts lexicalized as nouns in other languages, such as generic human terms -- 'person,' 'man,' 'woman,' 'child' -- are lexicalized as verb roots in CT. Verbs can be derived from nouns and adverbs with the verbalizer = *e<sup>3</sup>*.

If one considers all and only the surface structures of the language, none of the properties I have listed above fully distinguishes nouns and verbs. This is because CT displays some nonverbal predicate constructions -- the verbless locative construction and several attributive constructions -- in which nouns can be marked with subject proclitics and undergo the same nominalizing and subordinating processes as verbs. Since these predicates are also exceptional in several other ways, I exclude them from consideration in the definition of verbs. That is, words which can take subject proclitics and subordination only in verbless locative predicates and attributive predicates are nouns, not verbs. Likewise, many verb stems can be used, without any morphological derivation, as nouns referring to the property or event expressed by the verb stem. Because nouns of this type

have specific semantic properties, I view this as zero nominalization rather than as evidence of a weak noun-verb distinction.

## 7.2 Deixis and word class

It is relevant to the study of deixis in CT that all underived deictic elements in the language, other than elements conveying TME, are morphologically nouns. It is easiest to see this in the realm of temporal deictics. These elements, such as *i<sup>1</sup>?ne<sup>1</sup>* 'yesterday' and *ju<sup>1</sup>?ma<sup>4</sup>* 'now,' are all morphologically nouns and not adverbs, since they can participate in possessive constructions and take the adverbializer = *ã<sup>1</sup>ki<sup>2</sup>*. Locative deictics, such as *nu<sup>5</sup>a<sup>2</sup>* 'DLOC:here,' are also nouns and not adverbs, since they can participate in possessive constructions, can participate in the verbless locative construction, and can be adverbialized. While these nouns display unusual case behavior (§11.1.8), the other aspects of their morphosyntax are fully consistent with their status as nouns.

Similarly, CT does not display spatially deictic verbs such as the English verbs 'come,' 'go,' 'bring,' and 'take.' These concepts are expressed using motion verbs with locative deictics as adjuncts. Absent locative deictics, motion verb roots express only the manner of motion. For example, the most semantically general motion verb, *ũ<sup>43</sup>*, can be glossed as 'come' and 'go' when it occurs with a locative deictic adjunct, but its focus behavior shows that its encoded meaning is actually 'walk.' Likewise, there are no underived manner deictics, either adverbs or verbs. Instead, adverbialized and case-marked forms of the Class IV inanimate nominal deictics (§9.1.1) are used to express manner deixis. The only non-TME element which can be understood as deictic and which is not morphologically a noun is the verb *ã<sup>1</sup>ki<sup>3</sup>*. When this word is used without derivation, it is a recognitional deictic verb (Enfield 2003) which might be glossed in English as 'do whatchamacallit.' When it is nominalized, it can function as a recognitional deictic noun '(the) whatchamacallit' or, with the Class IV nominalizer, as a general hesitation word 'um.'

## 8 Noun types

CT nouns can be divided into groups based on their morphosyntactic properties in three ways. One can sort nouns according to their behavior in possessive constructions and incorporation. This kind of sorting isolates five 'form classes' of nouns: alienably possessed nouns (which includes all deictics other than pronouns), inalienably possessed nouns, noun classifiers, quantifiers, and pronouns. One can also sort nouns according to the agreement which they trigger on other constituents. Sorting by agreement yields four 'noun classes,' each with a core group of semantically predictable members. Or one can sort by animacy, where there is a morphological division between animates and inanimates.

Agreement classes, form classes, and animacy are mostly orthogonal. Knowing that a noun is inalienably possessed or is a pronoun -- that is, knowing its form class -- is not sufficient to predict its agreement class, and knowing a noun's animacy is never sufficient to predict either its form or its agreement class. Therefore, I describe form class, agreement class, and animacy phenomena separately: form class in §8.1, animacy in §8.2, and agreement class in §8.3.

## 8.1 Form classes

The form class of a noun is defined by the noun's behavior in nominal possession, attributive and possessive predicates, and incorporation. For reasons of space, I discuss only nominal possession here (§8.1.1), leaving aside the predicate phenomena. I then comment on the semantic properties of the nouns in each form class (§8.1.2).

### 8.1.1 Defining form class by nominal possession

**Alienably possessed nouns** CT displays two nominal possessive constructions: the possessive construction for alienably possessed nouns and the one for inalienably possessed nouns. In the possessive construction for alienably possessed nouns, the noun denoting the possessor precedes the noun denoting the possessum. If the possessor is a noun phrase or a nonpronominal deictic, then its last element bears the alienable possession enclitic =  $\tilde{a}^1r\tilde{i}^3$  (94a-c). If the possessor in an alienable possession construction is a pronoun, it appears in a suppletive form specific to this construction (94d).

- (94) Possessive construction for alienably possessed nouns (GE.LCS.20160701, GE.DGG.20160701)
- Proper name possessor:  $Ka^3ru^1\tilde{a}^1r\tilde{i}^3\ o^1\tilde{i}^5$  'Carlos' grandfather'
  - Referential noun possessor:  $ja^3t\tilde{i}^1\tilde{a}^1r\tilde{i}^3\ o^1\tilde{i}^5$  '(the) man's grandfather'
  - Demonstrative possessor:  $\eta e^3ma^2\tilde{a}^1r\tilde{i}^3\ o^1\tilde{i}^5$  'that (Class IV) guy's grandfather'
  - Pronominal possessor:  $ku^3r\tilde{i}^3\ o^1\tilde{i}^5$  'your grandfather'

The enclitic =  $\tilde{a}^1r\tilde{i}^3$  forms a single phonological word with the base. The phonological form of the enclitic and of the alienable possession pronouns, though, makes it impossible to determine from phonological criteria whether an alienable possessor forms a single phonological word *with its possessum*. It is clear, though, that alienable possessors and their possessa form separate morphological words, since it is possible to gap an alienable possessum in a contrastive topic construction such as (95).

- (95) Gapping in alienable possession construction  
 $r\tilde{i}^1\ to^3r\tilde{i}^3\ tfa^3pa^3tu^1\ ta^1\ ta^4ta^5e^3,\ tfo^3r\tilde{i}^3\ r\tilde{i}^1\ tfau^1e^3ne^2\tilde{e}^3\tilde{a}^1r\tilde{i}^3$ .

$r\tilde{i}^1\ to^3r\tilde{i}^3$                        $tfa^3pa^3tu^1\ ta^1\ ta^4=$                        $ta^5e^3$        $tfo^3r\tilde{i}^3$                        $r\tilde{i}^1\ tfau^1-$   
 TOP 1EXCL.AL.POSS shoe              also 1EXCL.SBJ.MC.A = buy/sell 1SG.AL.POSS and 1SG-  
 \* $e^3ne^2\tilde{e}^3$  - $\tilde{a}^1r\tilde{i}^3$   
 \*brother -AL.POSS

'We bought *our shoes*, mine and my brother's  $\emptyset$ .' (LCS, ldt 1:21)

**Inalienably possessed nouns** In the possessive construction for inalienably possessed nouns and noun classifiers, the noun denoting the possessor again precedes the noun denoting the possessum. But unlike in the alienable possession construction, no morphology intervenes between the possessor and the possessum. If the possessor is a noun phrase or a demonstrative, the possessum encliticizes directly to its last element, with no licensing morphology (96a,b; 97a,b). If the possessor is a pronoun, it must appear in a suppletive form specific to the inalienable possession

construction (96c,d; 97c,d). The inalienable possession forms of pronouns are different from both pronouns in isolation and the alienable possession forms of pronouns. I discuss them at greater length in §11.2.

- (96) Possessive construction for inalienably possessed nouns (GE.LCS.20160701, GE.DGG.20160701)
- Referential noun possessor:  $ja^{31}ti^1ta^4?a^2$  '(the) man's grandchild'
  - Demonstrative possessor:  $gu^2ma^4ta^4?a^2$  'that (Class II) guy's grandchild'
  - Pronominal possessor:  $na^4ta^4?a^2$  'his/her/their grandchild'
  - Cannot be possessed by alienable possession pronoun:  $*ku^{31}ri^3 ta^4?a^2$  (intended: 'your grandchild')
- (97) Possessive construction for noun classifiers (GE.LCS.20160701, GE.DGG.20160701)
- Referential noun possessor:  $tfa^2wi^5tji^4i^3$  'corn beer, warm corn beverage'
  - Demonstrative possessor:  $ne^3ma^2tji^4i^3$  'liquid/beverage made from that' (not 'that one's liquid' or 'that liquid')
  - Pronominal possessor:  $tfa^1tji^4i^3$  'my liquid,' i.e. 'beverage made for/by me'
  - Cannot be possessed by alienable possession pronoun:  $*no^{51}ri^3 tji^4i^3$  (intended: 'his/her/its liquid')

Inalienably possessed nouns and noun classifiers behave as enclitics with respect to their possessors. Three tests illustrate this generalization. First, while alienable nouns are grammatical in isolation as citation forms, inalienable nouns and noun classifiers are not (98). Consultant comments indicate that -- as expected for clitics -- uses of inalienable nouns in isolation are semantically interpretable, even though they are ungrammatical.

- (98) Alienable nouns are acceptable in isolation; inalienable nouns and noun classifiers are not (GE.LCS.20160701, GE.DGG.20160701)
- Alienable noun acceptable:  $o^1?i^5$  'grandfather'
  - Inalienable noun unacceptable:  $*ta^4a^2$  (intended: 'grandchild')
  - Noun classifier unacceptable:  $*tji^4i^3$  (intended: 'liquid')

Second, the phonological processes described in §6 always indicate that inalienably possessed nouns and noun classifiers form a single Prosodic Word with their possessor. The same processes apply when inalienable nouns and classifiers are incorporated into verbs, indicating that they also form a single Prosodic Word with the verb stem under incorporation. And third, inalienable nouns and noun classifiers never display segments or tones which are restricted to the first syllable of the Prosodic Word (§4.5).

The ordering properties of inalienably possessed nouns are different when they appear in the noun phrase than when they are incorporated into verbs. When inalienable nouns appear in the noun phrase, they can be either preceded or followed by other clitics, except that they must precede case clitics. (There are no true affixes to nouns; §11.3.) The order of inalienable nouns relative to non-case clitics appears to be a function of scope. A clitic which scopes over the possessor precedes an inalienable noun, and one which scopes over the noun follows it. (99) illustrates this for the plural clitic.

- (99) Variable ordering of inalienable noun and plural clitic

- a. Inalienable noun followed by plural:  $\tilde{r}^{43}\tilde{a}^3t\tilde{f}i^1n\tilde{a}^1\tilde{r}\tilde{a}^3g\tilde{i}^4$   
 $\tilde{r}^{43} \quad * \tilde{a}^3t\tilde{f}i^1n\tilde{a}^1\tilde{r}\tilde{a}^3 = g\tilde{i}^4$   
house \*bone = PL  
'house frame (lit. bones of the house)' (Anderson 1962: 316)
- b. Plural followed by inalienable noun:  $ch\tilde{i}no = g\tilde{i}^4g\tilde{a}^1w\tilde{a}^5$   
 $ch\tilde{i}no = g\tilde{i}^4 * g\tilde{a}^1 = w\tilde{a}^5$   
Sp:  $ch\tilde{i}no = PL$  \*voice = ALL  
'in Chinese (lit. the language of the *chinos*)' (KSC, kiq 1:30)

When inalienably possessed nouns are incorporated into verbs, on the other hand, they obligatorily occur inside of the causative suffix and several other verbal morphs which, on syntactic criteria, are clearly suffixes. This can be interpreted in two ways. One is to say that inalienable nouns are clitics when they appear in the noun phrase, but affixes in the verb phrase. The other is to abandon the assumption that clitics are always ordered outside of affixes, say that inalienable nouns are always clitics, and attribute their ordering in verb stems to scope principles.

**Special morphological properties of inalienably possessed nouns** Inalienably possessed nouns display two unusual morphological properties in possessive constructions. The first is that, when an entity denoted by an inalienably possessed noun is unpossessed in the world, it must be grammatically possessed by the 'default possessor' morph  $na^{43}$ . (This morph is in a minimal tone pair with the third person Class III/IV inalienable possessor pronoun  $na^4$ .) The default possessor morph can also be used when the identity of the possessor is either not known or not relevant in the discourse. Take the inalienable noun  $-ma^1t\tilde{f}i^3$  'meat, flesh' as an example. It is equally acceptable to refer to meat of a known species using either the species name, i.e.  $wo^3ka^1ma^1t\tilde{f}i^3$  'cow meat,' or the default possessor morph, i.e.  $na^3ma^1t\tilde{f}i^3$  'the meat' (GE.LCS.20160719).

Nouns derived with the default possessor morph can participate in the alienable possession construction, although this alters their possible readings (100).

- (100) Noun with default possessor morph can be possessed by alienable possession pronoun:  
 $no^{51}r\tilde{i}^3 na^3ma^1t\tilde{f}i^3$   
 $no^{51}r\tilde{i}^3 \quad na^3- \quad *ma^1t\tilde{f}i^3$   
3.II/III/IV.AL.POSS DEF.POSS- \*meat
- a. 'his meat (he possesses meat of another animal)'  
b. #'his flesh (meat of his own body)' (GE.LCS.20150727)

There is no equivalent to the default possessor morph for alienably possessed nouns. Because of this, and because of the possession behavior shown in (100), I analyze the default possessor morph as deriving an alienably possessed noun.

The second unusual property of inalienably possessed nouns is that when one inalienable noun possesses another inalienable noun, the order of the possessor and possessum can sometimes be reversed. For example, both  $t\tilde{f}au^1- *pa^4ta^3- *?e^4t\tilde{i}^1$  (1SG- \*house- \*space.above), with canonical possessor-possessum order, and  $t\tilde{f}au^1- *?e^4t\tilde{i}^1- *pa^4ta^3$  (1SG-space.above-house), with reversed possessum-possessor order, are acceptable as meaning 'the roof of my house.' Note, though, that in both of these cases, it remains obligatory for the first inalienable noun in linear order to be possessed by a non-inalienable noun.

**Noun classifiers** Returning to the broader issue of form class, the *morphology* of possession distinguishes three form classes of nouns: alienable nouns, defined by participating as possessa in the alienable possession construction; inalienable nouns and noun classifiers, defined by participating as possessa in the inalienable possession construction; and pronouns, defined by appearing in suppletive allomorphs when they participate as possessors in either kind of possessive construction.

We can further distinguish quantifiers from all other nouns, and inalienable nouns from noun classifiers, by examining the *possible readings* of inalienably possessed nouns and noun classifiers in possessive constructions headed by quantifiers. I exemplify with cardinal numerals, since most other quantifiers in CT are morphologically derived from stative verbs (§9.2.3).

When a numeral acts as the morphological possessor of an inalienably possessed noun, it can be read only as an elliptical NP which possesses the noun (101a,b). Proposed readings in which the numeral quantifies the inalienably possessed noun are unacceptable (101c).

- (101) Numerals as morphological possessors of inalienably possessed nouns (GE.LCS.20160701, GE.DGG.20160701)
- a. Numeral read as possessor:  $wi^{43}\eta^4-tfi^5ru^1$  (one-clothes) 'someone's/one person's clothing'
  - b. Numeral read as possessor:  $ta^2\eta re^4-tfi^5ru^1$  (two-clothes) 'clothing of two (people)' (one article of clothing has two possessors)
  - c. Numeral cannot be read as quantifier:  $\#wi^{43}\eta^4-tfi^5ru^1$  (one-clothes), intended: 'one article of clothing'
  - d. Numeral cannot be read as quantifier:  $\#ta^2\eta re^4-tfi^5ru^1$  (two-clothes), intended: 'two articles of clothing'

Part terms, especially human body part terms, present a partial exception to this generalization. A numeral-part term construction can be read either with the numeral possessing the noun (102a), as with other inalienable nouns, or with the pseudo-quantificational reading 'Numeral side(s) of the Part' (102b). Readings of numeral-part term constructions with the numeral quantifying the body part, on the other hand, are unacceptable.

- (102) Numerals as morphological possessors of inalienably possessed nouns referring to body parts
- a. Numeral read as possessor:  $wi^{43}\eta^4na^4\eta a^3$  (one-\*neck) 'someone's/one person's neck' (GE.DGG.20160611)
  - b. Numeral read as 'Num side(s) of the Body Part':  $wi^{43}\eta^4pe^1ki^2$  (one-\*elbow) 'one side of the elbow,' #'one elbow' (GE.UGW.20160611)

When a numeral is the morphological possessor of a noun classifier, on the other hand, it can be read as a quantifier (103a). It also remains possible to read the numeral as the head of an elliptical NP which possesses the noun (103b,c).

- (103) Numerals as morphological possessors of noun classifiers (GE.LCS.20160701, GE.DGG.20160701)
- a. Numeral read as quantifier:  $ta^2\eta re^4t\eta i^4\eta^3$  (two-\*CLF:container) 'two containers'
  - b. Numeral read as possessor:  $ta^2\eta re^4-t\eta i^4\eta^3$  (two-\*CLF:container) 'two people's container, container for two things'

- c. Numeral read as possessor:  $wi^{43}zi^4 \cdot *tʃi^{43}$  (one-<sup>\*</sup>CLF:container) 'one person's container, container for one thing'

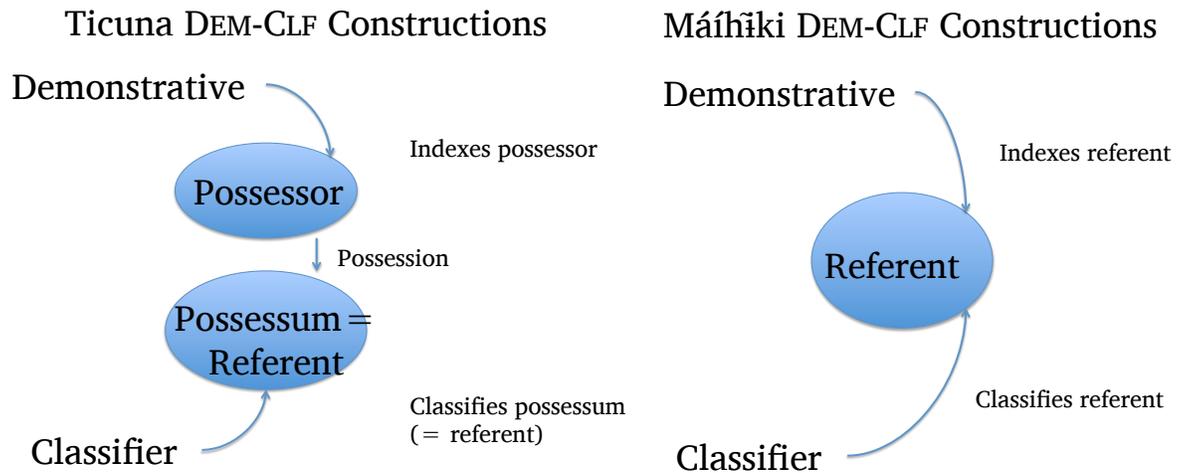
CT classifiers are semantically diverse and sometimes encode the characteristic function of the referent as well as, or instead of, its physical properties. For example, the classifier  $-ʔne^1$  'CLF:weapon' primarily encodes the function of the referent, while the classifier  $-mĩ^1$  'CLF:soft.undifferentiated.mass' encodes only the physical properties of the referent. With the latter type of classifiers -- those that refer exclusively to physical properties -- a numeral which acts as the morphological possessor of the classifier is almost invariably read as quantifying it (104a). The possessor reading exemplified in (101a,b) and (103b,c) becomes strongly dispreferred, though I hesitate to say that it is impossible (104b).

- (104) Numerals as morphological possessors of noun classifiers encoding only shape (GE.LCS.20160701, GE.DGG.20160701)
- Numeral read as quantifier:  $ta^2ʔre^4 \cdot me^4 na^2 ʔã^2$  (two-CLF:1D.narrow) 'two long narrow objects (e.g. sticks, needles)'
  - Numeral infelicitous as possessor:  $ta^2ʔre^4 \cdot me^4 na^2 ʔã^2$  (two-CLF:1D.narrow)  $?/ \#$  'stick/needle belonging to two people'

Inalienable nouns and noun classifiers display a similar pattern, with different possible readings but no morphological contrast between the two classes, in attributive and possessive predicates. They display an overt morphological contrast only in incorporation. In incorporation, classifiers denoting instruments can undergo incorporation into verbs, while inalienable nouns denoting instruments cannot. Additionally, incorporated classifiers and incorporated inalienable nouns occupy different slots in the verb template, and for many cases of classifier incorporation, it is not possible to construct an equivalent predicate with no incorporation (while this is always possible for incorporated inalienable nouns). This represents evidence that the distinction between inalienable nouns and noun classifiers is syntactic as well as semantic.

**Demonstratives and noun classifiers** Relative to the study of deixis, it is crucial to know that the only possible reading of a demonstrative affixed with a noun classifier in CT is one in which the demonstrative points to a referent which possesses another referent that is classified by the classifier. For example,  $ʔe^3 ma^2 \cdot tʃi^{43}$  (DNOM:ANA.IV-CLF:liquid) can only be read as meaning 'liquid expressed from that (e.g. fruit) or 'liquid belonging to that (e.g. person)'. It cannot mean 'that liquid' (GE.LCS.20160701, GE.DGG.20160701). This is areally unusual. In other languages of Northwestern Amazonia with noun classifiers, such as the Western Tukanoan (Farmer 2015), Boran-Witotoan (Thiesen & Weber 2012), and Peba-Yaguan languages (Payne 2007), exactly the opposite reading obtains. A demonstrative bearing a classifier points to a referent that is *classified by the classifier*. Such a construction cannot be read in these languages with the referent of the demonstrative *possessing* the referent that is classified by the classifier. This, however, is the only possible reading in CT. (105) visually depicts this difference, taking Máhĩki classifiers (Farmer 2015) as an example of the more common areal type.

- (105) Visual representation of demonstrative-classifier constructions in Ticuna vs. in Máhĩki, a more areally typical classifier language



Classifiers appearing on demonstratives play a crucial role in reference tracking in other languages of Northwestern Amazonia. But, perhaps as a result of the difference depicted in (105), such constructions do not seem to play any role in reference tracking in connected discourse in CT. The main contribution of classifiers to reference tracking in the language instead comes from the use of classifiers incorporated into verbs.

### 8.1.2 Form class and semantics

As the data in §8.1.1 suggests, knowing the semantics of a noun is sometimes, but not always, sufficient to identify its form class. The relationship between form class and meaning is one-to-one only for quantifiers. All nouns which are semantically quantificational, including derived and recently borrowed nouns, participate in the form class which I have labeled as 'quantifiers.' The relationship between form class and meaning is also strong, but no longer one-to-one, for deictics. Nouns which are referential indexicals in the semantics are split between two syntactic form classes. Demonstratives, or referential indexicals which are not subject to binding, are syntactically like alienable referential nouns, in that they do not undergo suppletion in possessive constructions. Pronouns, which are subject to binding, form a separate form class defined by suppletion in both of the possessive constructions.

It is much more difficult to identify a semantic basis for the remaining three form classes: alienable nouns, inalienable nouns, and noun classifiers. In languages that distinguish between alienable and inalienable nouns, it is common for part terms and kin terms to be lexicalized as inalienable nouns and all other nouns to be lexicalized as alienable (Aikhenvald 2013).

In CT, however, these notional categories of possession do not map straightforwardly to form class. Based on the set of 216 inalienable nouns in my lexicon, only one of Aikhenvald's (2013) three typological generalizations holds: almost all part terms are inalienable. Approximately one-third of kin terms, however, are alienable. Many alienable kin terms are borrowed from TG or Iberian languages -- for example, *tu<sup>3</sup>tí<sup>5</sup>* 'mother's brother' from Omagua *tutira*, and *ma<sup>3</sup>ma<sup>5</sup>* 'mother' and *pa<sup>3</sup>pa<sup>5</sup>* 'father' from Spanish. This reflects a broader tendency for loanwords to be alienable. More

interesting, relative to Aikhenvald's prediction, is the space of semantically unusual inalienable nouns. Nouns denoting items which are prototypically acquired through labor or exchange are typologically predicted to be alienable. But in CT, many nouns denoting such referents are inalienable. These nouns include \*ʔpɑ<sup>1</sup> 'skirt,' \*pa<sup>1</sup> 'hammock,' \*tʃa<sup>3</sup>gɪ<sup>1</sup> 'necklace,' \*ʔtʃi<sup>5</sup>ru<sup>1</sup> 'clothes,' \*ʔpi<sup>3</sup> 'bolt of cloth; commercially manufactured item,' \*a<sup>1</sup>ne<sup>1</sup> 'garden; piece of owned land,' and \*tʃi<sup>3</sup>ki<sup>2</sup> 'mature garden; area of secondary growth in forest.' And oddly, all terms denoting bodies of water, such as \*ti<sup>4</sup> 'river,' \*ʔti<sup>4</sup>ʔi<sup>1</sup> 'creek,' and \*ta<sup>4</sup>a<sup>3</sup> 'lake,' are inalienable.

Given this distribution, it is more useful to ask what concepts are lexicalized as *alienable* nouns than which are lexicalized as inalienable. Here, both semantic and etymological generalizations are available. The semantic generalization is that all non-relational nouns denoting living entities or kinds -- proper names, animate and inanimate species names, and species hypernyms (e.g. 'tree', 'fish') -- are alienable. The etymological generalization is that all nouns which are not formed on a native vocabulary noun stem are alienable. By this, I mean that all deverbal nouns, including deverbal nouns where the deverbal derivation is not semantically transparent, such as tʃi<sup>5</sup>ʔi<sup>4</sup> 'oil, grease' (< tʃi<sup>1</sup> 'be delicious'), are alienable. Likewise, all borrowed nouns are alienable, except for the TG loan \*ʔtʃi<sup>5</sup>ru<sup>1</sup> 'clothes.' Nouns which fall outside these categories are quantitatively more likely to be inalienable than alienable, even where one might think that the referent of the noun is not prototypically possessed by another entity.

The semantic contrast between inalienable nouns and noun classifiers can also be fuzzy, since there are some nouns, like \*tʃi<sup>4</sup>ʔi<sup>3</sup> 'house; CLF:container,' which can be used as either inalienable nouns or classifiers. Nevertheless, noun classifiers have two core semantic properties. They (a) classify only inanimates and (b) classify referents only for their generic physical properties (e.g. dimensionality, consistency) or type of use by humans (e.g. weapon, container, vehicle). Inalienable nouns, by contrast, potentially encode information about non-physical, non-use properties. They also typically convey physical or use information with greater detail than classifiers do. For example, the inalienably possessed noun \*ʔtʃi<sup>5</sup>ru<sup>1</sup> 'cloth, clothes' entails that its referent is made of fabric (a physical property). The typical classifier for this noun, \*mĩ<sup>1</sup>, can be used to classify any object made of fabric, but can also be used to classify mud, mashed or grated manioc, and dough. Thus, \*mĩ<sup>1</sup> conveys information about a general physical property -- that the referent classified is an undifferentiated mass (its configuration) which is soft to the touch (its consistency) -- while \*ʔtʃi<sup>5</sup>ru<sup>1</sup> encodes a specific physical property, the material from which the referent is made.

## 8.2 Animacy

Nouns are also divided into two groups on the basis of animacy: animates and inanimates. All nouns referring to humans and animals are grammatically animate. A handful of nouns referring to notionally inanimate entities, for example ki<sup>3</sup>ʔtʃi<sup>1</sup> 'knife' and i<sup>3</sup>q<sup>1</sup>ki<sup>3</sup> 'sun,' are also grammatically animate. Following Corbett (1991), I refer to these nouns as 'inanimate animates.' All other nouns referring to notionally inanimate entities are grammatically inanimate.

Animacy has several morphological reflexes. First, CT has a number of verb roots which require that their internal argument be inanimate. These include *ã<sup>3</sup>* 'give (inanimate object),' *i<sup>43</sup>* 'put, bring/take (inanimate object, nonpluractional),' *na<sup>31</sup>* 'bring/take (inanimate object, pluractional), and *nũ<sup>4</sup>* 'put (inanimate object, nonpluractional).' When the internal argument is animate (unless it is dead), all of these verb roots are ungrammatical. One must instead use *mũ<sup>2</sup>* 'bring/take/put/give (animate object).' Other verb roots, especially posture verbs and handling verbs, participate in

similar pairs. Second, animacy controls differential accusative marking (§11.1.2), the only context where the distinction between humans and animals is morphologically relevant, and some other phenomena in case marking. Third, animacy also controls the availability of noun class skewing (§10). Noun class skewing conveying social deixis is only available to animate nouns. So is noun class skewing conveying indefiniteness. Indefiniteness either is not marked, is marked syntactically, or is marked by case on inanimate nouns (§11.1.4).

### 8.3 Agreement classes

CT nouns are divided into four agreement classes. The assignment of nouns to agreement classes is exhaustive and is based exclusively on semantic criteria, positioning the language as an extreme example of a semantic noun class system (Corbett 1991). By this, I mean that knowing the meaning of a noun is typically sufficient to determine its agreement class; knowing its form, except if it is a nominalization, is not sufficient to predict its agreement class. This section describes only the semantic basis of noun class assignment. I take up noun class agreement and nonprototypical noun class in §8.

CT displays four noun classes. Following Corbett (1991), I label them with Roman numerals. Class I contains both animate and inanimate nouns. Its core animate members are nouns referring to human women and girls, such as women's proper names and kinship terms referring to women, for instance *ma<sup>3</sup>ma<sup>5</sup>* 'mother' (< Spanish) and *\*ti<sup>1</sup>ki<sup>3</sup>* 'paternal aunt.' The core non-human members of Class I are nouns referring to sweet plant foods and shiny trade objects. Plant food terms in Class I include the nouns *ko<sup>2</sup>re<sup>1</sup>* 'sweet potato,' *i<sup>1</sup>ru<sup>5</sup>* 'sweet plantain,' and *tji<sup>1</sup>ni<sup>4</sup>* 'pineapple.' Terms for shiny trade objects in Class I include *ki<sup>3</sup>?tji<sup>1</sup>* 'knife' (< TG, ~ Omagua *kifi*), *di<sup>3</sup>ẽ<sup>3</sup>ru<sup>1</sup>* 'money' (< Spanish or Portuguese *dinero*) and *wo<sup>3</sup>ru<sup>3</sup>a<sup>1</sup>* 'mirror' (< TG, ~ Omagua *warua* 'copal'). For most speakers, the terms for shiny objects are grammatically animate. Class I also includes a number of nouns which do not have a clear semantic connection to the semantically predictable members. I refer to these as the 'unpredictable members' of Class I. They include *no<sup>2</sup>bi<sup>4</sup>* 'turtle sp' and *nu<sup>1</sup>ta<sup>3</sup>* 'stone.'

Class II also contains both animate and inanimate nouns. Its core animate members are nouns referring to human men and boys, such as men's proper names and kinship terms referring to men, like *pa<sup>3</sup>pa<sup>5</sup>* 'father' (< Spanish). The core inanimate members of the class are nouns denoting celestial bodies, weather phenomena, and (by extension) time periods, such as *i<sup>3</sup>a<sup>1</sup>ki<sup>3</sup>* 'sun,' *pu<sup>2</sup>ki<sup>3</sup>* 'rain,' *mũ<sup>2</sup>ki<sup>3</sup>* 'flood; flood season,' and *ji<sup>3</sup>?i<sup>3</sup>* 'week; Sunday'.<sup>6</sup> Many nouns referring to trees, such as *wai<sup>5</sup>ra<sup>1</sup>* 'Euterpe precatoria,' *te<sup>5</sup>ma<sup>4</sup>* 'Mauritia flexuosa,' and *ta<sup>3</sup>?i<sup>4</sup>* 'Pouteria caimito,' are also in Class II. Unpredictable members of Class II include *do<sup>5</sup>wi<sup>1</sup>* 'manioc bread' and *tfe<sup>3</sup>ra<sup>1</sup>* 'saw' (as well as several deverbal nominalizations referring to kinds of machete files). In line with strong areal trends, the terms for celestial bodies are grammatically animate. All other notional inanimates in Class II are grammatically inanimate.

Class III contains only (notionally and grammatically) inanimate nouns. It is the class for all nouns referring to objects which are prototypically produced by the labor of one's own household. This includes terms for cultigens, such as *ti<sup>2</sup>?e<sup>1</sup>* 'manioc' and *tfa<sup>2</sup>wi<sup>5</sup>* 'corn'; terms for objects prototypically produced by men, such as *ĩ<sup>4</sup>3* 'house,' *no<sup>3</sup>e<sup>3</sup>* 'canoe,' and *i<sup>1</sup>?ẽ<sup>3</sup>* 'blowgun'; and terms for objects

<sup>6</sup>This term historically referred to the girls' puberty ritual (Nimuendajú 1952), but today, it exclusively means 'Sunday' and by extension 'week.' It is not used to refer to the puberty ritual, which is now called *wo<sup>1</sup>re<sup>1</sup>ki<sup>3</sup>tji<sup>1</sup>ga<sup>1</sup>* 'day of the girl at menarche.'

prototypically produced by women, such as *ti<sup>3</sup>pi<sup>3</sup>ti<sup>1</sup>* 'manioc press.' By extension from *ĩ<sup>43</sup>* 'house' and *ɲu<sup>31</sup>e<sup>3</sup>* 'canoe,' Class III includes all nouns referring to buildings and vehicles, even extremely recent or nonce loans from Spanish. For example, in a discussion of a text passage about motorcycles (ebu 1:29), I asked SSG to use the Spanish noun *motocarro* 'motorcycle taxi' in a Ticuna noun phrase. (This noun is not a word of Ticuna in any meaningful way. It does not, for instance, have a conventional adapted pronunciation.) SSG produced *motokaro ja<sup>2</sup> ta<sup>31</sup>ɲ<sup>5</sup>ne<sup>1</sup>* 'big motorcycle taxi,' with Class III agreement. He judged Class IV agreement (for semantic residue) unacceptable.<sup>7</sup> Except for these instances of extension, nouns for manufactured objects which have not historically been produced by Ticuna people -- for example, terms for edged tools -- are not in Class I. The unpredictable members of Class III include two human body part terms, *\*e<sup>5</sup>ti<sup>3</sup>* 'eye' and *\*ɲme<sup>1</sup>e<sup>3</sup>* 'hand; digit.'

Class IV contains both animate and inanimate nouns. Its core animate members are the handful of human nouns which do not encode the gender of their referent, such as *\*mi<sup>1</sup>ki<sup>3</sup>* 'companion' and *jo<sup>3</sup>ra<sup>5</sup>* 'owner.' Many animal species names are also Class IV, though the criteria for assignment of animal species to classes is not clear to me. The inanimate nouns in Class IV are not semantically predictable. Rather, they represent the semantic residue -- all inanimate nouns that are not positively assigned to another class based on semantic criteria. Some inanimate members of the class include *i<sup>2</sup>ɲi<sup>3</sup>* 'fuel (firewood/gas/gasoline), *u<sup>3</sup>i<sup>1</sup>* 'manioc flour' (< Nheengatú *ui*; cf. Class II *do<sup>51</sup>wi<sup>1</sup>* 'manioc bread' and Class III *ti<sup>2</sup>ɲe<sup>1</sup>* 'manioc'), and *ta<sup>3</sup>ra<sup>5</sup>* 'machete' (cf. Class I *ki<sup>3</sup>ɲti<sup>1</sup>* 'knife' and Class II *tfe<sup>3</sup>ra<sup>1</sup>* 'saw'). As in Class III, there are no mismatches between grammatical and notional animacy in Class IV.

Evidence for the residue status of Class IV comes from the use of Class IV morphology in complementation, discourse deixis, and locative deixis. The nominalizers for Class IV are the only ones which can be used to form sentential complements. Likewise, the Class IV pronouns are the only pronouns which can refer to a sentential complement in anaphora and cataphora. In the deictic domain, the Class IV nominal deictics are the only ones used for discourse deixis; they are the morphological bases for all manner deictics; and they have a close morphological relationship with the locative deictics. In other words, in anaphora to a constituent that is not a noun, or deixis to something (like the manner of an action) that cannot be referred to with a noun, and therefore does not have a noun class, it is always Class IV morphology that appears.

There is some variation between speakers in the class assignment of particular nouns. I worked with five speakers on noun class topics, four men -- DGG, MFC, SSG, and LCS -- and one woman, LWG. These five people display variation on three topics: (a) whether the terms for shiny objects in Class I are grammatically animate, (b) whether there are any notional inanimates in Class I, (c) whether all nouns referring to trees are in Class II. On (a), LCS treats all notionally inanimate nouns in Class I as grammatically inanimate. In this he differs from his contemporaries SSG and LWG, who treat nouns referring to shiny objects in Class I as grammatically animate. On (b), MFC does not have any notionally inanimate nouns in Class I. For him, the Class I inanimates are all in Class IV. SSG was also not consistent in his assignment of Class I inanimates. On (c), LCS has nouns referring to trees in Class IV rather than Class II. Though I do not have extensive data on this point, all other speakers appear to have the tree terms in Class II. The social basis of variation in noun class assignment is not clear to me.

<sup>7</sup>This is part of a larger semantic extension in which all vehicles are treated grammatically like canoes. For example, it is conventional to use the directional meaning 'into water' on verbs referring to entering vehicles, even when those vehicles are not literally located in water.

Table 5: Semantic criteria for noun class assignment

	Class I	Class II
Core Animates	Human women and girls: <i>ma<sup>3</sup>ma<sup>5</sup></i> 'mother'	Human men and boys: <i>pa<sup>3</sup>pa<sup>5</sup></i> 'father'
Other Grammatical Animates	Shiny objects: <i>ki<sup>3</sup>?tʃi<sup>1</sup></i> 'knife'	Celestial bodies: <i>i<sup>3</sup>q<sup>1</sup>ki<sup>3</sup></i> 'sun'
Core Inanimates	Sweet plant foods: <i>i<sup>1</sup>ru<sup>5</sup></i> 'sweet plaintain'	Weather phenomena: <i>pu<sup>2</sup>ki<sup>3</sup></i> 'rain'
Unpredictable Members	<i>nu<sup>1</sup>ta<sup>3</sup></i> 'rock'	Time periods: <i>ʃi<sup>3</sup>ʔi<sup>3</sup></i> 'week; Sunday' Trees: <i>wai<sup>5</sup>ra<sup>1</sup></i> 'E. precatória' <i>do<sup>5</sup>wi<sup>1</sup></i> 'manioc bread', <i>tʃe<sup>3</sup>ra<sup>1</sup></i> 'saw'
	Class III	Class IV
Core Animates	n/a - no animates	Human nouns not encoding gender: <i>ʃo<sup>3</sup>ra<sup>5</sup></i> 'owner'
Other Grammatical Animates	n/a - no animates	n/a - no animacy mismatches
Core Inanimates	Cultigens: <i>ti<sup>2</sup>?e<sup>1</sup></i> 'manioc' Buildings: <i>i<sup>4</sup>3</i> 'house' Vehicles: <i>ŋu<sup>3</sup>e<sup>3</sup></i> 'canoe'	Only residual inanimates: <i>ta<sup>3</sup>ra<sup>5</sup></i> 'machete' <i>u<sup>3</sup>i<sup>1</sup></i> 'manioc flour' discourse deixis
Unpredictable Members	<i>*me<sup>1</sup>?e<sup>3</sup></i> 'hand; digit'	n/a

Table 5 summarizes this analysis of the semantic basis for noun class assignment.

## 9 Noun class agreement

The form class and animacy of a noun does not trigger agreement on other constituents of the noun phrase. The agreement class of a noun, on the other hand, triggers many distinct forms of agreement in the noun phrase. Agreement class can also influence the form of the verb phrase. This section describes the phonological and morphological form of this agreement. In this section and subsequent sections, I refer to agreement class as simply 'noun class.'

The section is organized as follows. §9.1 describes the form of noun class agreement on constituents of the noun phrase, and §9.2 describes noun class agreement on constituents of the verb phrase and on nominalizations. §9.3 discusses the exceptional noun class behavior of first and second person pronouns. In all of these sections, I discuss the agreement which occurs with a noun that is treated as belonging to its prototypical class, defined as the class which it displays in existentials (§9.2.2). The following section, §10, turns to patterns of noun class skewing, or non-prototypical noun class agreement.

## 9.1 Noun class agreement in the noun phrase

In the nominal domain, four classes of words are targets of noun class agreement: nominal deictics, or demonstratives; pronouns; the numeral 'one'; and noun class particles. Quantifiers other than numerals, as well as many elements which syntactically resemble pronouns, are morphologically nominalizations, and I therefore discuss them in the section on nominalizations, §9.2.

Locative deictics can modify nouns and behave syntactically as part of the noun phrase, but they do not display noun class agreement. Numerals higher than one also do not display agreement.

### 9.1.1 Noun class agreement on nominal deictics

Demonstratives, or nominal deictics, display the largest number of noun class contrasts. There are five sets of nominal deictics: the Proximal series, the Binary Distal series, the Distal series, the Past General series, and the Nonpast General series. In very broad terms, the Proximal series is used in presentative and ostensive utterances where the referent presented is within the participants' here-space. The Distal series is used in presentatives and ostensives in contexts where the referent presented is not within the here-space. The Binary Distal series is used in contexts where attention is directed toward exactly two comparable referents. In this context, the Proximal is used to refer to the referent which is closer or the focus of attention, and the Binary Distal is used to refer to the other referent. This resembles some uses of 'this one...the other one' in English. In general, the Proximal and Distal are *not* otherwise used in non-ostensive exophoric deixis.

The Past General series is used in anaphora in sentences which have the more remote value of the language's binary TME contrast. It can also be used anaphorically and non-anaphorically in sentences with the less remote TME value to talk about referents which are associated with the past -- for example, time periods that have passed -- or which no longer exist. The Nonpast General series is used in anaphora in sentences with the less remote value of the TME contrast. Both of the sets of general demonstratives can also be used exophorically. In exophoric use, they differ from the Proximal and Distal in several ways. First, the general demonstratives do not appear to have any implications about the referent's location in space. Second, the general demonstrative cannot be used in ostensives or presentatives. And third, consultants judge the general demonstratives unacceptable in conjunction with durative full arm points, durative head points, or deictic gaze at the referent -- the kinds of gestures labeled 'B-points' by Enfield et al. (2007). They find the general demonstratives acceptable only with no gesture or with an 'S-point' toward the referent, such as a punctual finger point, flick of the finger, or toss of the head (GE.LWG.20160726, GE.DGG.20160803).

Table 6 provides a table of noun class agreement on nominal deictics. I elicited the forms in this table using a variety of frames. The frame for the Proximal and Distal series was a presentative sentence of the form *DEM, ku<sup>31</sup>ʔri<sup>3</sup> N* 'Here you go (PROX)/There it is (DIST), your N.' The frame for the Past General series was a negative existential clause, and the frame for the Nonpast General series was a sentence of the form *DEM N, ni<sup>31</sup>ʔi<sup>3</sup> tʃa<sup>3</sup>dau<sup>2</sup>* 'That/The N, I saw it.' I did not elicit the Binary Distal series. Forms for this series are from elicitation on other topics and from texts.

All of the forms in Table 6 are morphologically complex. The evidence, beyond the transparent segmentability of the forms, is that the laryngeal features of the Class II Proximal and Distal demonstratives indicate that the first syllable of these forms belongs to a different morpheme than the second syllable. (If these forms were monomorphemic, the Class II Proximal would be

Table 6: Noun class agreement on nominal deictics (GE.LWG.20160726, GE.DGG.20160801)

	Class I	Class II	Class III	Class IV
Ostensive				
Proximal	da <sup>31</sup> -ʔe <sup>2</sup>	da <sup>2</sup> -a <sup>2</sup>	da <sup>31</sup> -a <sup>1</sup>	ja <sup>4</sup> -a <sup>2</sup>
Distal	gu <sup>31</sup> -ʔe <sup>2</sup>	gu <sup>2</sup> -a <sup>4</sup>	gu <sup>31</sup> -a <sup>1</sup>	je <sup>4</sup> -a <sup>2</sup>
Non-Ostensive				
Binary Distal	nãĩ <sup>1</sup>	nãĩ <sup>1</sup>	nãĩ <sup>4</sup>	nãĩ <sup>3</sup>
Nonpast General	ji <sup>31</sup> -ʔe <sup>2</sup> -ma <sup>4</sup>	ji <sup>2</sup> -ma <sup>4</sup>	ji <sup>31</sup> -ma <sup>2</sup>	je <sup>3</sup> -ma <sup>2</sup>
Past General	gu <sup>31</sup> -ʔe <sup>2</sup> -ma <sup>4</sup>	gu <sup>2</sup> -ma <sup>4</sup>	gu <sup>31</sup> -ma <sup>2</sup>	je <sup>4</sup> -ma <sup>4</sup>

the only underived 22 word in the lexicon, and Class II Distal would represent an exception to the rule that glottal stop is inserted in a tautomorphic VV sequence with a rising tone melody.) I therefore represent the first syllable in all of the non-Class IV deictics as a separate morpheme in Table 6. I represent the first syllable of the Class IV deictics as a separate morpheme for a different reason: when the Class IV deictics bear clitics (and for some, when they appear utterance-finally), their second syllable deletes. Not all of the morphological complexity in Table 6, though, can be represented by assigning segments to morphemes. Throughout the paradigm, the contrast between Class II and Class III is consistently marked only by tone, and in the Binary Distal paradigm, all of the class contrasts are marked only by tone.

With the presupposition that the deictics are morphologically complex, they can be morphologically analyzed as follows. All deictic roots are monosyllabic and lack underlying tones. They have one allomorph for all classes other than Class IV and another for Class IV, the residue class. For the classes other than Class IV, the root of the Proximal is [da], the Distal root is [gu], the Nonpast General root is [ji], and the Past General root is [gu] (like the Distal). For Class IV, the Proximal root is [ja], the Distal root is [je], the Nonpast General root is [je], and the Past General root is [je] (again, like the Distal). Although one can identify subregularities in the phonological relationship between the Class IV and non-Class IV root allomorphs -- for example, the onset of the Class IV allomorph is always back of the onset of the non-Class IV allomorph, unless the non-Class IV allomorph is already maximally back -- there is no single generalization that relates the Class IV and non-Class IV forms, making this a case of suppletive root allomorphy. The Binary Distal deictic does not undergo Class IV vs. non-Class IV allomorphy. Its segmental form is always [nãĩ].

Beyond the first syllable, the segments of the forms in Table 6 expone the noun class of the referent and/or the type of the deictic. In the Proximal and Distal series, the second syllable of all non-Class I deictics is [-a]. Since these are the only forms that can be used in presentatives and ostensives, we can understand the [-a] as expounding a [+ostensive] deictic value underspecified for the proximal/distal contrast. In the General series, the final syllable in all classes is [-ma], which we can likewise understand as expounding a [-ostensive] value that is underspecified for tense. In addition, Class I deictics always have [-ʔe<sup>2</sup>] as the second syllable. This syllable can only be viewed as expounding Class I agreement. It replaces [-a] in the Ostensive forms, but co-occurs with [-ma] in the General forms. Nothing other than [-ʔe<sup>2</sup>] ever intervenes between the monosyllabic base of a General deictic and the final [-ma].

While the segments of deictics expone both deictic values and noun class, their tones are primarily grammatical. They expone noun class. Leaving aside the Binary Distal series, Class I deictics always have the tone melody 31.(2).4; Class II deictics have the melody 2.(4); and Class III deictics have the melodies 31.(1) and 31.(2). (The alternation between 31.(1) and 31.(2) in Class III could

be understood as involving the contrast between Ostensive and General series, but this analysis is not possible for the Class II forms.) Class IV deictics are the only forms with falling or level tone melodies. They display the melodies 4.(2) and 3.2. The Binary Distal forms do not participate in the regular tone patterns found in the other sets in the paradigm. This series also collapses the distinction between Class I and Class II, the core classes for animate nouns.

### 9.1.2 Noun class agreement on pronouns

Third person pronouns agree with their antecedents in noun class, modulo interclausal changes in noun class skewing (§10). In the paradigm for non-possessive pronouns, only Class I has a distinct form. Classes II, III, and IV are collapsed to a single form. This holds for the caseless pronouns, all case forms of pronouns, and alienable possession pronouns (§11.2). In the paradigm of inalienable possession pronouns, however, there is a three-way contrast. One form is used for Class I, another for Class II, and a third collapses Classes III and IV.

Table 7 displays these facts.

Table 7: Noun class agreement on pronouns (GE.LWG.20160726)

	Class I	Class II	Class III	Class IV
Caseless Pronoun	ti <sup>31</sup> -	ni <sup>31</sup> -		
Inalienable Possession	ti <sup>31</sup> ma <sup>2</sup> -	na <sup>2</sup> -	na <sup>4</sup> -	

Indefinite pronouns are used like English *wh*-pronouns in questions, like English indefinite pronouns in declaratives, and under the scope of negation, as negative indefinites. They distinguish only between referents that are presupposed to be human and other referents, cross-cutting noun classes. The indefinite pronoun *te<sup>1</sup>?e<sup>5</sup>* 'who?, whoever, someone' presupposes that the referent is human and *tq<sup>2</sup>?a<sup>4</sup>ki<sup>2</sup>* 'what?, whatever, something' presupposes that it is not. In a context where nothing about a referent is presupposed other than that it is human, *te<sup>1</sup>?e<sup>5</sup>* obligatorily triggers Class I agreement, but where the social gender of the referent is presupposed -- for example, in a sentence like 'Who are you?', where the addressee's social gender is typically known -- it is also compatible with Class II and Class IV agreement. This suggests that the Class I agreement in minimally enriched contexts is epiphenomenal on the more general use of Class I agreement for non-specific animate reference (§10).

There is a special third person pronoun, *ni<sup>1</sup>*-, which occurs only with noun phrases that have been skewed out of Class I. I discuss this pronoun in the noun class skewing section (§10).

### 9.1.3 Noun class agreement on *wi<sup>43</sup>?i<sup>4</sup>* 'a/one'

The quantifier *wi<sup>43</sup>?i<sup>4</sup>*, which is the numeral 'one' and an indefinite article, can optionally agree with the noun it quantifies in noun class. This quantifier is obligatorily *wi<sup>43</sup>?i<sup>4</sup>* when it quantifies a non-Class I noun (106a). When it quantifies a Class I noun, it can be either *wi<sup>43</sup>?i<sup>4</sup>-?e<sup>2</sup>* -- with the same Class I affix found on nominal deictics -- or *wi<sup>43</sup>?i<sup>4</sup>* (106b). I am not sure what this alternation encodes, but I suspect that it is related to the contrast between the numeral and indefinite article uses of the quantifier.

(106) Noun class agreement on *wi<sup>43</sup>?i<sup>1</sup>* 'a/one' (GE.LWG.20160722)

- a. Obligatory  $wi^{43}\eta^{i^4}$  with non-Class I noun:  
 $wi^{43}\eta^{i^4} i^4 ta^3ra^5$   
 one NCL:IV machete  
 'a/one machete,' cf.:  $*wi^{43}\eta^{i^4}\eta^{e^2} i^4 ta^3ra^5$  (one-I NCL:IV machete)
- b.  $wi^{43}\eta^{i^4}\eta^{e^2}$  acceptable with Class I noun:  
 $wi^{43}\eta^{i^4}\eta^{e^2} ja^4 \eta\tilde{u}^2$   
 one -I NCL:I/II *Theobroma.sp*  
 'a/one(?) *Theobroma* fruit'
- c.  $wi^{43}\eta^{i^4}$  also acceptable with Class I noun:  $wi^{43}\eta^{i^4} ja^4 \eta\tilde{u}^2$   
 $wi^{43}\eta^{i^4} ja^4 \eta\tilde{u}^2$   
 one NCL:I/II *Theobroma.sp*  
 'a/one(?) *Theobroma* fruit'

Numerals higher than one do not display noun class agreement.

#### 9.1.4 Noun class agreement on noun class particles

Noun class particles are an unusual feature of the Ticuna noun phrase. They are monosyllabic grammatical words which obligatorily intervene each word of the noun phrase, except that they do not intervene (a) between a possessor and its possessum or (b) between a (nominal or locative) deictic and the noun it modifies. A noun class particle also obligatorily precedes the first word of any noun phrase which follows the main verb of its clause. Noun class particles never bear any morphology, and they coalesce with adjacent vowels in fast speech, suggesting that they do not have stress. Given these properties, they could be analyzed as proclitics to the following noun.

Noun class particles fusionally expone two features of the noun phrase: its noun class, and its TME value. (In most cases, the TME value of the noun phrase is inherited from the TME value of the clause.) If the noun phrase has the Nonpast value of TME, the noun class particles expone noun class. They display the paradigm in the first row of Table 8. This paradigm collapses Class I and Class II with each other, and contrasts them with Class III and Class IV. If the noun phrase has the Past value of TME, the noun class particles expone only TME, and no longer expone noun class. They display the collapsed paradigm in the second row of Table 8.

Table 8: Noun class and TME agreement on noun class particles (GE.LWG.20160722)

	Class I	Class II	Class III	Class IV
Nonpast TME	ja <sup>4</sup>		ja <sup>2</sup>	i <sup>4</sup>
Past TME	ga <sup>4</sup>			

(107) and (108) provide examples of the noun class particle paradigm. (107) displays particles intervening between modifiers and nouns. (108) displays particles used to introduce postverbal noun phrases. Note in (108) that, although past TME suppresses noun class agreement on particles, it does *not* suppress noun class agreement on the existential verb. This reflects the larger generalization that noun class agreement is not suppressed in general -- only on particles -- in clauses with past TME.

## (107) Noun class particles in nonpast TME environment (GE.LWG.20160722)

- a. Class I:  $me^{31}\gamma\tilde{e}^3 ja^4 ki^3\gamma t\tilde{f}i^1$   
 $me^{43} -\gamma e^3 ja^4 ki^3\gamma t\tilde{f}i^1$   
 be.good -NMLZ:I NCL:I/II knife  
 'good knife'
- b. Class II:  $t\tilde{f}e^3ra^1 ja^4 te^5ki^3$   
 $t\tilde{f}e^3ra^1 ja^4 te^1 -ki^3$   
 saw NCL:I/II be.sharp -NMLZ:II  
 'sharp saw'
- c. Class III:  $t\tilde{i}^2\gamma e^1 ja^2 me^{31}\gamma\tilde{r}i^5ne^1$   
 $t\tilde{i}^2\gamma e^1 ja^2 me^{43} -\gamma\tilde{r}i^5ne^1$   
 manioc NCL:III be.good -NMLZ:III  
 'good manioc'
- d. Class IV:  $u^3i^1 i^4 me^{31}\gamma\tilde{r}i^4$   
 $u^3i^1 i^4 me^{43} -\gamma\tilde{r}i^4$   
 manioc.flour NCL:IV be.good -NMLZ:IV  
 'good manioc flour'

## (108) Noun class particles in past TME environment (GE.DGG.20160801)

- a. Class I:  $\eta i^2\gamma\tilde{r}i^4, ta^4gu^{31}\gamma e^2ma^3 ni^{41}\gamma\tilde{r}i^4 ga^4 di^3\tilde{e}^3ru^1$ .  
 $\eta i^2\gamma\tilde{r}i^4 ta^4 = gu^{31}\gamma e^2ma^3 ni^{41}\gamma\tilde{r}i^4 ga^4 di^3\tilde{e}^3ru^1$   
 logical.yes 3.NonI.SBJ.I.MC.A = PST.EXIST:I PRED.FOC NCL:PST money  
 'Yes, there was *money*.'
- b. Class II:  $\eta i^2\gamma\tilde{r}i^4, na^4gu^2ma^4 ni^{41}\gamma\tilde{r}i^4 ga^4 t\tilde{f}e^3ra^1$ .  
 $\eta i^2\gamma\tilde{r}i^4 na^4 = gu^2ma^4 ni^{41}\gamma\tilde{r}i^4 ga^4 t\tilde{f}e^3ra^1$   
 logical.yes 3.NonI.SBJ.MC.A = PST.EXIST:II PRED.FOC NCL:PST saw  
 'Yes, there were *saws*.'
- c. Class III:  $\eta i^2\gamma\tilde{r}i^4, na^4gu^{31}ma^2 ni^{41}\gamma\tilde{r}i^4 ga^4 t\tilde{i}^2\gamma e^1$ .  
 $\eta i^2\gamma\tilde{r}i^4 na^4 = gu^{31}ma^2 ni^{41}\gamma\tilde{r}i^4 ga^4 t\tilde{i}^2\gamma e^1$   
 logical.yes 3.NonI.SBJ.MC.A = PST.EXIST:III PRED.FOC NCL:PST manioc  
 'Yes, there was *manioc*.'
- d. Class IV:  $na^4je^4ma^4 ni^{41}\gamma\tilde{r}i^4 ga^4 u^3i^1$ .  
 $na^4 = je^4ma^4 ni^{41}\gamma\tilde{r}i^4 ga^4 u^3i^1$   
 3.NonI.SBJ.MC.A = PST.EXIST:IV PRED.FOC NCL:PST manioc.flour  
 'There was *manioc flour*.'

## 9.2 Noun class agreement in the verb phrase and nominalizations

Within the verb phrase, subject proclitics and the existential verb agree with the subject for noun class. Deverbal nominalizations are used as quantifiers; as modifiers expressing property concepts (like English adjectives); and to form relative clauses. In all of these uses, deverbal nominalizations must also agree in class with the nouns they modify. Here I discuss agreement on subject proclitics and the existential verb, then consider deverbal nominalizations.

### 9.2.1 Noun class agreement on subject proclitics

In the paradigm of third person subject proclitics for main clauses, only Class I has a distinct form. Classes II, III, and IV are collapsed, as in pronouns. In the paradigm of third person subject proclitics for subordinate clauses, though, the situation is more complex. On the first mention of a subject, and when the subject is referred to with a free pronoun, the verb must have a subject proclitic from the Subordinate Clause A series. But on non-first mentions with no pronoun -- those where the subject could be or actually is referred to with a general demonstrative -- the subject proclitic comes from the Subordinate Clause B series.

In the Subordinate Clause A series, as in main clauses, the Class I proclitics contrast with the proclitics for all other classes. In the Subordinate Clause B series, on the other hand, all noun classes are collapsed. Although the forms of the Subordinate Clause A and II proclitics differ between inflection classes, this pattern of syncretism is the same across all inflection classes that have both series. (Intransitive *i*-class verbs have only the Subordinate Clause A series.) Object proclitics do not display noun class agreement.

Table 9 provides a table of third person subject proclitics illustrating these generalizations.

Table 9: Noun class agreement on subject proclitics (GE.LWG.20160726)

	Class I	Class II/III/IV
Main Clause		
<i>a</i> -class	ta <sup>4</sup> = V	na <sup>4</sup> = V
<i>ri</i> <sup>3</sup> -class	ta <sup>4</sup> ri <sup>3</sup> = V	na <sup>4</sup> ri <sup>3</sup> = V
<i>i</i> -class	ti <sup>4</sup> = V	ni <sup>43</sup> = V
<i>i</i> <sup>1</sup> -class	ti <sup>41</sup> = V	ni <sup>41</sup> = V
<i>i/i</i> <sup>1</sup> -class, tr. with object proclitic	ta <sup>4</sup> = V	na <sup>4</sup> = V
Subordinate Clause A		
<i>a</i> -class, intr., tr. without object proclitic	ta <sup>2</sup> = V	na <sup>1</sup> = V
<i>a</i> -class, tr. with object proclitic	ta <sup>2</sup> = na <sup>3</sup> = V	na <sup>1</sup> = V = ?a <sup>1</sup>
<i>ri</i> <sup>3</sup> -class	ta <sup>2</sup> ri <sup>3</sup> = V	na <sup>1</sup> = V
<i>i/i</i> <sup>1</sup> -class, intr.	ti <sup>2</sup> = V	ja <sup>1</sup> = V
<i>i/i</i> <sup>1</sup> -class, tr. without object proclitic	ti <sup>2</sup> = V	ja <sup>1</sup> = V
<i>i/i</i> <sup>1</sup> -class, tr. with object proclitic	ta <sup>2</sup> = ja <sup>3</sup> = V	ja <sup>1</sup> = V = ?a <sup>1</sup>
Subordinate Clause B		
<i>a</i> -class, intr., tr. without object proclitic		∅ = V
<i>a</i> -class, tr. with object proclitic		na <sup>1</sup> = V = ?a <sup>1</sup>
<i>ri</i> <sup>3</sup> -class		ri <sup>3</sup> = V
<i>i/i</i> <sup>1</sup> -class, intr.	ti <sup>2</sup> =	ja <sup>1</sup> =
<i>i/i</i> <sup>1</sup> -class, tr. without object proclitic		i <sup>2</sup> = V
<i>i/i</i> <sup>1</sup> -class, tr. with object proclitic		ja <sup>1</sup> = V = ?a <sup>1</sup>

It may seem strange that there are two subject proclitic series for subordinate clauses, but only one for main clauses. But recall that Ticuna discourse is highly hypotactic, with many more subordinate than main clauses (§3). At least in terms of frequency, subordinate clauses are less marked than main clauses. It is not anomalous, then, that there are more contrasts in subordinate than in main clauses.

### 9.2.2 Noun class agreement on the existential verb

The existential verb root agrees in class with the pivot of the existential. It also expones the TME value of the clause. (When the TME value of the noun phrase and of the clause conflict, the existential expones the TME value of the clause rather than of the noun phrase.) In nonpast clauses, the existential verb root is identical to the nonpast general demonstrative. In past clauses, it is identical to the past general demonstrative. Table 10 displays the forms of the existential for both TME values.

Table 10: Noun class agreement on the existential verb root (GE.DGG.20160725, GE.DGG.20160801)

	Class I	Class II	Class III	Class IV
Nonpast Existential	ji <sup>31</sup> -ʔe <sup>2</sup> -ma <sup>4</sup>	ji <sup>2</sup> -ma <sup>4</sup>	ji <sup>31</sup> -ma <sup>2</sup>	ɲe <sup>3</sup> -ma <sup>2</sup>
Past Existential	gu <sup>31</sup> -ʔe <sup>2</sup> -ma <sup>4</sup>	gu <sup>2</sup> -ma <sup>4</sup>	gu <sup>31</sup> -ma <sup>2</sup>	je <sup>4</sup> -ma <sup>4</sup>

Despite the identity in shape between the existential verb and the general demonstrative, the two paradigms are not identical in other respects. One morphological difference between the paradigms is that the second syllable of the Class IV general demonstratives deletes when the demonstrative bears a clitic. The second syllable of the Class IV existentials, however, does not delete when the verb bears a clitic.

In CT, the existential verb is used for many kinds of non-existential predicates, such as locative predicates and possessive predicates with alienable nouns. For Class II, Class III, and Class IV nouns, the same existential verb root can be used in these kinds of predicates and in true existential clauses (those which are true if at least one entity that has the properties of the noun exists). The existential can also be used for both locative and true existential clauses for inanimate Class I nouns. But for animate Class I nouns, it is grammatical to use the Class I existential verb only in true existentials. This makes the locative use of the existential verb in (109a) unacceptable. One must instead use a verbless locative construction (109b). The unacceptability of the Class I existential in this context must be related to the association of Class I with non-specificity (§10.2), but I am not sure how.

(109) Class I existential is ungrammatical with animate noun in locative predicate (GE.DGG.20160803)

a. \*tʃau<sup>1</sup>tʃi<sup>4</sup>ʔwa<sup>5</sup> ta<sup>4</sup>ji<sup>31</sup>ʔe<sup>2</sup>ma<sup>3</sup> ja<sup>4</sup> tʃo<sup>31</sup>ʔri<sup>3</sup> no<sup>31</sup>ʔe<sup>5</sup>.

tʃau<sup>1</sup> \*tʃi<sup>4</sup>ʔri<sup>3</sup> = wa<sup>5</sup> ta<sup>4</sup> = ji<sup>31</sup>ʔe<sup>2</sup>ma<sup>3</sup> ja<sup>4</sup> tʃo<sup>31</sup>ʔri<sup>3</sup>  
 1SG.POSS \*house = ALL 3.NonI.SBJ.I.MC.A = EXIST.I NCL:I/II 1SG.AL.POSS  
 no<sup>31</sup>ʔe<sup>5</sup>  
 grandmother

Intended reading: 'My grandmother is in my house.'

b. Consultant repaired to verbless locative construction: tʃau<sup>1</sup>tʃi<sup>4</sup>ʔwa<sup>5</sup> ta<sup>4</sup>ɲe<sup>2</sup>ʔma<sup>4</sup> ja<sup>4</sup> tʃo<sup>31</sup>ʔri<sup>3</sup> no<sup>31</sup>ʔe<sup>5</sup>.

tʃau<sup>1</sup> \*tʃi<sup>4</sup>ʔri<sup>3</sup> = wa<sup>5</sup> ta<sup>4</sup> = ɲe<sup>2</sup>ʔma<sup>4</sup> ja<sup>4</sup> tʃo<sup>31</sup>ʔri<sup>3</sup>  
 1SG.POSS \*house = ALL 3.NonI.SBJ.I.MC.A = DLOC:ANA NCL:I/II 1SG.AL.POSS  
 no<sup>31</sup>ʔe<sup>5</sup>  
 grandmother

'My grandmother is in my house.'

Note that in (109b), the head of the predicate is  $\eta e^{2?}ma^4$ , the nonpast anaphoric locative deictic. This item is in a quasi-minimal pair with the Class IV existential  $\eta e^3ma^2$ , making it tempting to analyze (109b) as involving skewing of the noun  $no^{3?}e^5$  from Class I to Class IV. The Class I agreement on the subject proclitic and the Class I particle introducing the subject, however, indicate that  $no^{3?}e^5$  has not undergone skewing in (109b).

### 9.2.3 Noun class agreement on deverbal nominalizations

Deverbal nominalizations often modify other nouns in CT. Almost all quantifiers other than numerals are deverbal nominalizations. Similarly, for a property concept verb such as  $tfo^1$  'be white' or  $me^{43}$  'be good' to modify a noun rather than acting as a predicate, it must be nominalized. And for any kind of verb to act as the head of a relative clause, it likewise also be nominalized. Beyond these modifier uses, deverbal nominalizations can also be used as the heads of noun phrases. I discuss first deverbal nominalizations used as modifiers, then those used as heads.

When a deverbal nominalization modifies a noun, it must agree with the noun in class. The noun class agreement paradigm for deverbal nominalizers is shown in Table 11. I do not know what conditions the presence of glottal stop in the Class I and Class II nominalizers. Note that the paradigm of deverbal nominalizers is the only part of the noun class agreement paradigm where every noun class has a segmentally different exponent of agreement.

Table 11: Noun class agreement on deverbal nominalizations (GE.DGG.20160801)

Class I	Class II	Class III	Class IV
-(ʔ)e <sup>3</sup>	-(ʔ)ki <sup>3</sup>	-ʔi <sup>5</sup> ne <sup>1</sup>	-ʔi <sup>4</sup>

The deverbal nominalization paradigm is the same for all kinds of noun-modifying deverbal nominalizations -- quantifiers, relative clauses, and property concept modifiers. (110) provides examples of nominalizer agreement on the universal quantifier, which is syntactically a deverbal nominalization of the verb root  $gu^1$  'run out.'

(110) Noun class agreement on the universal quantifier (GE.LWG.20160722)

- a. Class I:  $gu^5\eta e^3ma^3 ja^4 \eta\tilde{u}^2$   
 $gu^1 -\eta e^3 -ma^3 ja^4 \eta\tilde{u}^2$   
 be.all -NMLZ:I -INFO NCL:I/II *Theobroma*  
 'all the *Theobroma* fruit'
- b. Class II:  $gu^5ki^3ma^3 ja^4 bu^3a^1ne^1ki^3$   
 $gu^1 -ki^3 -ma^3 ja^4 bu^3a^1ne^1ki^3$   
 be.all -NMLZ:II -INFO NCL:I/II wind  
 'all the wind'
- c. Class III:  $gu^5\eta i^5ne^1ma^3 ja^2 \eta u^{3?}e^3gi^4$   
 $gu^1 -\eta i^5ne^1 -ma^3 ja^2 \eta u^{3?}e^3 = gi^4$   
 be.all -NMLZ:III -INFO NCL:III canoe = PL  
 'all the canoes'
- d. Class IV:  $gu^5\eta i^4ma^3 i^4 ta^3ra^5gi^4$

gu<sup>1</sup> -ʔi<sup>4</sup> -ma<sup>3</sup> i<sup>4</sup> ta<sup>3</sup>ra<sup>5</sup> = gi<sup>4</sup>  
 be.all -NMLZ:IV -INFO NCL:IV machete = PL  
 'all the machetes'

Besides clearly deverbal modifiers like the universal quantifier, there are also some modifiers which -- though they look formally like deverbal nominalizations and display the deverbal nominalization forms of noun class agreement -- cannot be synchronically understood as nominalizations. Citing Class IV forms, these include *ni<sup>31</sup>ma<sup>2</sup>ʔi<sup>4</sup>* 'some,' which agrees in class with the noun it quantifies; *ʔe<sup>1</sup>ʔi<sup>4</sup>ri<sup>4</sup>ʔi<sup>2</sup>ʔi<sup>4</sup>* 'which one?, any one,' which agrees in class with the noun it quantifies; and *ʔe<sup>1</sup>ʔi<sup>4</sup>* 'where?,' which is used only in copular clauses and agrees for noun class with the subject.

I mentioned at the beginning of this section that deverbal nominalizations can also act as the heads of noun phrases. Such constructions do not necessarily involve ellipsis. Evidence for this is that all basic person terms such as 'person,' 'man,' 'woman,' and 'child' are deverbal nominalizations. Likewise, it is possible for a deverbal nominalization to be used as a personal name -- for example, some people in Cushillococha call me by the nickname *tʃo<sup>5</sup>e<sup>3</sup>* 'White (Class I),' and the name *me<sup>43</sup>ma<sup>3</sup>ʔi<sup>5</sup>ki<sup>3</sup>* 'Beautifully Spotted (Class II)' was a traditional name for men belonging to the *ai<sup>31</sup>* 'big cat' clan (Nimuendajú 1952:59).

All of the nominalizers shown in Table 11 can derive either a modifier or a noun that acts as the head of the noun phrase. When they derive a head, all of the modifiers of that head must agree with the nominalizer in noun class. For example, take the noun *du<sup>1</sup>ʔi<sup>3</sup>ʔi<sup>4</sup>* 'person,' which is a Class IV nominalization of the stative verb *du<sup>1</sup>ʔi<sup>1</sup>* 'be human.' If one quantifies this noun with the universal quantifier, the resulting noun phrase shows Class IV agreement on every constituent: *gu<sup>5</sup>ʔi<sup>4</sup>ma<sup>3</sup> i<sup>4</sup> du<sup>1</sup>ʔi<sup>3</sup>ʔi<sup>4</sup>gi<sup>4</sup>* (all.IV NCL:IV person = PL) 'all the people' (GE.LWG.20160722). Which nominalizer is used in a given head nominalization is determined by the same semantic criteria used to assign underived nouns to noun classes, modulo noun class skewing. For example, since the noun *du<sup>1</sup>ʔi<sup>3</sup>ʔi<sup>4</sup>* 'person' is derived with a Class IV nominalizer, it encodes no information about social gender. The Class I nominalization, *du<sup>1</sup>ʔi<sup>3</sup>ʔe<sup>3</sup>*, is normally construed as meaning 'woman,' since women are the core members of Class I. But in noun class skewing contexts, it can be used to refer to people of either gender (§10).

There are also two nominalizing constructions which can derive only heads, not modifiers, quantifiers, or relative clauses. These are the agent/instrument nominalizer = *ru<sup>5</sup>ʔi<sup>1</sup>* and the event/state nominalization, which is morphologically zero. These nominalizers differ from the Table 11 nominalizers in that they do not derive a noun of a particular class. Instead, the nouns which they derive are assigned to noun classes according to the now-familiar semantic criteria. For example, the agent/instrument nominalization *ʔaj<sup>1</sup>ʔtʃi<sup>5</sup>ru<sup>1</sup>ru<sup>5</sup>ʔi<sup>1</sup>* (sew-\*NI:clothes-NMLZ:agent) 'sew-er' can be construed as meaning either 'sewing machine' or 'person who sews.' When it means 'sewing machine,' it triggers Class III agreement on modifiers, since Class III is the class for all machines. When it means 'person who sews,' it triggers agreement determined by the social gender of the referent: Class I for a woman, Class II for a man, and Class IV for a person whose gender is unknown or irrelevant (GE.DGG.20160803).

### 9.3 The noun class membership of first and second person pronouns

First and second person pronouns, or participant pronouns, have anomalous noun class properties. They trigger Class IV agreement on noun class particles, but Class I agreement on the proximal demonstrative. (111) illustrates the demonstrative agreement, and (112) illustrates the noun class particle agreement. Both kinds of agreement with participant pronouns are the same regardless of the social gender of the referent.

(111) Class I agreement on demonstrative with participant pronouns (GE.DGG.20160801)

a.  $da^{31}\eta e^2\ t\tilde{f}i^{31}\tilde{\eta}^4$  (\* $da^{31}a^1\ t\tilde{f}i^{31}\tilde{\eta}^4$ , \* $\eta a^4a^2\ t\tilde{f}i^{31}\tilde{\eta}^4$ )

$da^{31}\eta e^2$              $t\tilde{f}i^{31} =$              $\tilde{\eta}^4$   
DNOM.PROX:I 1SG.MC.II = COP

'Here I am.'

b.  $da^{31}\eta e^2\ ki^{31}\tilde{\eta}^4$  'Here you (sg) are.'

c.  $da^{31}\eta e^2\ ti^{41}\tilde{\eta}^4$  'Here we (incl or excl) are.'

d.  $da^{31}\eta e^2\ pi^{31}\tilde{\eta}^4\ gi^4$  'Here you (pl) are.'

(112) Class IV agreement on noun class particles with participant pronouns

a.  $ri^1\ t\tilde{f}a^3\text{-confia} = \tilde{\eta}^5\tilde{f}i^2\ po^2ra^4\tilde{a}^1ki^2\ i^4\ t\tilde{f}o^1ma^2$ .

$ri^1\ t\tilde{f}a^3 =$              $confia = \tilde{\eta}^5\tilde{f}i^2\ po^2ra^4\tilde{a}^1ki^2\ i^4$              $t\tilde{f}o^1ma^2$   
and 1SG.MC.A = Sp:confiar = INTENS INTENS            NCL:IV 1SG

'(It seemed we were about to lose.) But I really had a lot of trust (that we would win).'

(DGG, kug 3:38)

b.  $\eta e^1\eta ta^5\ ne^5\ ni^{41}\tilde{\eta}^4\ pi^2\tilde{\eta}^3\tilde{\eta}^4\ i^4\ pe^1ma^2?$

$\eta e^1\eta ta^5 = ne^5$              $ni^{41} =$              $\tilde{\eta}^4$              $pi^2 =$              $\tilde{\eta}^3$              $\tilde{\eta}^4$              $i^4$   
where? -SOURCE 3.NonI.SBJ.MC.II = COP 2.PL.SC.I = come/go.PLACT -SUB NCL:IV  
 $pe^1ma^2$   
2PL

'Where is it that you guys come from?' (KSC, kiq 0:57)

In elicited data, nominalizations modifying a participant pronoun, such as relative clauses, always have Class IV agreement (113a), again regardless of the gender of the referent. But I have also heard Class I agreement on nominalizations modifying a second person pronoun in contexts, such as (113b), where the speaker would refer to the addressee with Class I agreement in its social deixis use. I do not have data on the behavior of true existential constructions with a participant pronoun as the pivot, or on pronouns with other nominal deictics.

(113) Noun class agreement on nominalizations with participant pronouns

a. Class IV agreement:  $to^{31}\tilde{\eta}^3\ na^4\ dau^2\ na^4\ i^1\eta ne^1\ i^5\ ta^2\eta u^3\ gi^5\tilde{\eta}^4$ .

$to^{31} = \tilde{\eta}^3$              $na^4 =$              $dau^2\ na^4$              $i^1\eta ne^1$              $i^5 =$              $ta^2 =$   
1EXCL = ACC 3.NonI.SBJ.MC.A = see            COMP yesterday DIR = 1EXCL.SBJ.SC.A =  
 $\eta u^3 = gi^4\ \tilde{\eta}^4$   
arrive = PL -NMLZ:IV

'He saw us, the ones who arrived yesterday.' (GE.LCS.20160712)

b. Class I agreement:  $gu^5\eta e^3\ ma^3\ ta^4\tilde{f}i^4\ gi^4$

gu<sup>1</sup> -ʔe<sup>3</sup> -ma<sup>3</sup> ta<sup>4</sup> = tʃi<sup>4</sup> = gi<sup>4</sup>  
 be.all -NMLZ:I -INFO 1INCL.SBJ.MC.A = stand.up = PL  
 'Let's all stand up!' (Sunday school teacher to her class; OS 20160717)

## 10 Noun class skewing

In many languages with noun class, certain nouns or subsets of nouns -- especially those denoting animates -- have 'common gender.' Nouns of common gender can take agreement patterns associated with several different noun classes. For example, in the Caucasian language Archi, the noun *lo* can take Class I (feminine) agreement, meaning 'girl'; Class II (masculine) agreement, meaning 'boy'; or Class III agreement, meaning 'young (of an animal)' (Corbett 1991:181, citing Kibrik 1972:126). In a more familiar example, all Spanish deverbal nouns in *-ante*, such as *cantante* 'singer,' have common gender. These nouns take feminine agreement when they refer to an entity that is known to be female. Otherwise, they take masculine agreement.

Ticuna takes the common gender phenomenon to an extreme in two ways. First, in most noun class systems, there are relatively few nouns which can take agreement for more than one noun class. In CT, on the other hand, all non-Class IV nouns can take agreement for at least one additional noun class. Second, in most cases of common gender in the literature, the agreement occurring with a common gender noun conveys context-independent properties of the referent of the noun. In Corbett's (1991) Archi example, for instance, Class I agreement with *lo* 'girl/boy/young' conveys that the referent of *lo* is female. While non-prototypical noun class agreement in CT can convey context-independent properties of the referent, this is not usually its function. Instead, it typically conveys context-dependent information, such as the information status of the referring expression, the definiteness of the referring expression, or social deixis toward the referent. This is typologically unusual, but not unattested. Noun class agreement can also index social deixis in Lak (Nakh-Daghestanian; Corbett 1991) and Shona (Bantu; Déchaine et al. 2014). It indexes both social deixis and definiteness -- just as in CT -- in Kambaata (Cushitic; Treis 2007, cited in Corbett 2013).

Because of these differences from canonical common gender phenomena, I do not use the term 'common gender' to refer to the variable noun class agreement in CT. Instead, I call it 'noun class skewing.' In some recent literature (Fleming 2015), 'skewing' is used as a cover term for the use of non-prototypical number and person features to achieve social deixis -- for example, use of third person pronouns with second person reference as an index of respect for the addressee. My use of the term 'skewing' to describe manipulation of noun class highlights its similarities with these more familiar deictic phenomena.

CT displays five forms of skewing. Animate nouns can be skewed between all of Classes I, II, and IV to convey context-independent properties of the referent, such as its social gender (§10.1). Animate nouns can also be skewed from Class II and Class IV into Class I to convey either (a) indefiniteness (§10.2) or (b) social deixis (§10.3). Animate nouns that are underlyingly Class I can be skewed into a unique agreement paradigm that cannot be attached to any noun class. This agreement paradigm likely also indexes social deixis (§10.4). And both inanimate and animate nouns of any class can be skewed into Class IV. In this case, skewing seems to reflect the information status of the noun (§10.5).

### 10.1 Conveying social gender: Between Classes I, II, and IV

Recall from §8.3 that, for animates, the semantic core of Class I is nouns referring to women; of Class II, nouns referring to men; and of Class IV, animate beings of underspecified social gender. This can be represented featurally by assigning Class I the feature [+female], Class II [+male], and Class IV [-female -male].

When a Class IV noun refers to a being of known social gender, it can be skewed into Class I or Class II to index that gender. For example, consultants always volunteer Class IV agreement when asked to produce phrases with the noun  $jo^3ra^5$  'owner,' suggesting that it is underlyingly [-male -female] and therefore Class IV (114a). But when  $jo^3ra^5$  refers to a person who is known to be female, it takes Class I agreement (114b), and when it refers to a person who is known to be male, it takes Class II agreement (114c). The same holds for non-human animate Class IV nouns such as  $o^3ta^5$  'chicken.'

(114) Class IV noun  $jo^3ra^5$  skewed into Class I and Class II to indicate social gender

- a. Class IV in citation form:  $jo^3ra^5 i^4 tʃi^{43}e^2ʔi^4$   
 $jo^3ra^5 \quad i^4 \quad tʃi^{43}e^2 \quad -ʔi^4$   
owner(IV) NCL:IV be.bad -NMLZ:IV  
'ugly/morally bad owner' (GE.LWG.20160722)
- b. Class I referring to woman:  $jo^3ra^5 ja^4 me^{31}ʔe^3$   
 $jo^3ra^5 \quad ja^4 \quad me^{43} \quad -ʔe^3$   
owner(IV) NCL:I/II be.good -NMLZ:I  
'beautiful/morally good (female) owner' (GE.DGG.20160803)
- c. Class II referring to man:  $jo^3ra^5 ja^4 me^{31}ki^3$   
 $jo^3ra^5 \quad ja^4 \quad me^{43} \quad -ki^3$   
owner(IV) NCL:I/II be.good -NMLZ:II  
'beautiful/morally good (male) owner' (GE.DGG.20160803)

Some animal species names underlyingly belong to Class I or Class II. Consultants always volunteer Class I agreement, for example, with the species name  $no^2bi^4$  'turtle species,' and always volunteer Class II with the species name  $mai^1ʔku^3$  'Squirrel Monkey.' When these terms refer to individual animals of known gender, they can take agreement conveying that gender. Class II  $mai^1ʔku^3$  takes Class I agreement when it refers to a female individual (116) while Class I  $no^2bi^4$  takes Class IV agreement when it refers to a male individual (115). Note that Class I animal species names are *not* skewed into Class II to convey maleness (115c).

(115) Class I noun  $no^2bi^4$  'turtle sp' skewed into Class IV to indicate maleness

- a. Class I in citation form:  $da^{31}ʔe^2 no^2bi^4$  (GE.SSG.20160723)  
 $da^{31}ʔe^2 \quad no^2bi^4$   
DNOM.PROX:I turtle.sp(I)  
'this (is a)  $no^2bi^4$  turtle'
- b. Class IV referring to male individual:  $no^2bi^4 i^4 ta^{43}ʔi^4$  (GE.LWG.20160803)  
 $no^2bi^4 \quad i^4 \quad ta^{43} \quad -ʔi^4$   
turtle.sp(I) NCL:IV be.big -NMLZ:IV  
'big (male)  $no^2bi^4$  turtle'

- c. Ungrammatical with Class II: \* $\eta o^2 bi^4 ja^4 ta^{31} ki^3$  (GE.LWG.20160803)
- (116) Class II noun  $mai^1 \eta ku^3$  'Squirrel Monkey' skewed into Class I to indicate femaleness (GE.LCS.20160721)
- a. Class II in citation form:  $da^2 a^2 mai^1 \eta ku^3$   
 $da^2 a^2$                        $mai^1 \eta ku^3$   
 DNOM.PROX:II Squirrel.Monkey(II)  
 'this (is a) Squirrel Monkey'
- b. Class I referring to female individual:  $da^{31} \eta e^2 mai^1 \eta ku^3$   
 $da^{31} \eta e^2$                        $mai^1 \eta ku^3$   
 DNOM.PROX:I Squirrel.Monkey(II)  
 'this (is a) (female) Squirrel Monkey'

I am aware of only two inanimate nouns for which noun class agreement conveys context-independent properties. One is  $i^2 \eta i^3$ , which takes either Class III or Class IV agreement. When this word takes Class IV agreement, it means 'fuel (firewood, gas, gasoline).' When it takes Class III agreement, it means 'fire, hearth' (GE.LCS.20160722). The other is  $nu^1 ta^3$  'stone.' This word takes either Class I or Class II agreement. When it takes Class I agreement, it can refer to any kind of stone. When it takes Class II agreement, it refers specifically to a stone that has been shaped for use as a machete file (GE.LWG.20160803). More research is necessary to determine if there are other inanimate nouns of this type.

Noun class skewing conveying context-independent properties displays an important grammatical difference from all other forms of noun class skewing. It is permitted in true existential constructions (117). No other form of noun class skewing is attested in my roughly 200 examples of true existentials, although I did not collect negative data on this point.

- (117) Noun class skewing conveying context-independent properties allowed in existentials  
 $na^4 gu^2 ma^4 ga^4 o^3 ta^5$   
 $na^4 =$                        $gu^2 ma^4$     $ga^4$                        $o^3 ta^5$   
 3.NonI.SBJ.MC.A = EXIST.II NCL:PST chicken(IV)  
 'There were roosters.' (GE.DGG.20160801)

## 10.2 Conveying non-specificity: Classes II and IV to Class I

Animate nouns of Class II and Class IV can be skewed into Class I to convey that a reference is non-specific. By this, I mean that Class I agreement in reference to an entity that is not prototypically Class I can convey either (a) that the speaker is speaking of the referent of the noun as a kind, rather than as a set of specific individuals, or (b) that the speaker is referring to a particular set of referents, but without identifying them.

While the non-specific use of Class I agreement can occur in NPs that are headed by non-Class I referential nouns, it is much more common with NPs that are headed by nominalizations or deictics. One especially important deictic involved in this agreement pattern is the Class I general demonstrative  $ji^{31} \eta e^2 ma^4$ , which in non-specific use can be glossed as 'someone, anyone.' This element often introduces a relative clause with the non-specific use of Class I agreement, for example in (118a), (119), and (120a). Outside of the non-specific use of Class I agreement, demonstratives

do not usually head relative clauses in CT. This suggests that, in this use,  $ji^{31}\eta e^2ma^4$  may be better analyzed as an indefinite pronoun. Note that this element is not necessary for the non-specific reading of Class I agreement to be available (118b, 120b).

I begin with the kind-level meaning of Class I agreement. Class I agreement is used, to the total exclusion of other noun classes, in discourses which predicate states or activities of animate beings in general rather than of specific individuals or sets of individuals. This use is ubiquitous in procedural texts. (118) provides some examples of this use of Class I agreement to achieve generic reference to humans.

(118) Class I agreement for generic human reference

a.  $ji^{31}\eta e^2ma^4 \eta i^5\eta e^3 ri^1 ta^4 ta^4po^3ku^2$ .

$ji^{31}\eta e^2ma^4 \eta i^1 -\eta e^3 ri^1 ta^4 ta^4 = po^3ku^2$   
 DNOM.ANA:I steal -NMLZ:I TOP FUT 3.I.SBJ.MC.A = be.imprisoned  
 'Whoever steals, he will/should go to prison.' (GE.LCS.20160712)

b.  $\eta e^2e^3ri^3e^2ma^3re^3 ja^4 wo^3ka^1\tilde{a}^5\eta e^3 ri^1 ta^4na^3pa^4 ta^1$ .

$\eta e^2e^3ri^3e^2 = ma^3re^3 ja^4 wo^3ka^1 = \tilde{a}^1 -\eta e^3 ri^1 ta^4 =$   
 which.one.I = just NCL:I/II cow = have -NMLZ:I TOP 3.I.SBJ.MC.A =  
 $na^3 = pa^4 ta^1$   
 3.NonI.OBJ.MC.A = hit.flank also

'Whoever has a cow, they hit it on the flank.' (GE.SSG.20160713)

c.  $ri^1 \eta e^3ma^2 ni^{41}\tilde{\eta}^4 wi^{43}\tilde{\eta}^4 i^4 \eta e^5tja^1\tilde{i}^1, ki^2a^4na^4, e^3ri^4 \eta i^1ri^3\tilde{a}^4t\tilde{j}i^4 ti^3\tilde{\eta}^3 ri^1 ta^4 ni^{41}ma^1$ .

$ri^1 \eta e^3ma^2 ni^{41} = \tilde{i}^4 wi^{43}\tilde{\eta}^4 i^4 \eta e^5tja^1\tilde{i}^1 -0 ki^2a^4na^4$   
 and DNOM.ANA.IV 3.IV.SBJ = COP one NCL:IV be.sad -NMLZ:state right?  
 $e^3ri^4 \eta i^1ri^3\tilde{a}^4t\tilde{j}i^4 ti^3 = \tilde{\eta}^3 ri^1 ta^4 ni^{41} = ma^1$   
 because maybe 3.I.PRO = ACC TOP FUT 3.IV.SBJ = hit/kill

'And that (what I was just talking about) is a bad thing, right, because they (intoxicated people) might kill someone.' (SSG, iia 2:38)

Class I agreement is also used in contexts where it is not presupposed that the referent of a noun phrase actually exists, as in (119). I elicited this example after hearing LWG say an analogous sentence while making announcements at a Christian church service. After LWG made a list of announcements, she asked if anyone else in the congregation wanted to speak before the end of the service. When no one moved -- suggesting that there was no one who wanted to speak -- she said a version of (119). In this context, the Class I agreement on the nominalization in (119) appears to explicitly suspend an existence presupposition of the nominalization. The use of Class I agreement in this context is analogous to the existence presupposition-based alternation in the purposive case for inanimate referents (§11.1.4).

(119) Class I agreement where existence of human referent cannot be presupposed

$ta^4t\tilde{j}i^4 ja^4 ji^{31}\eta e^2ma^4 i^4de^3i^3a^3tja^1\tilde{i}^3e^3$ .

$ta^4 = t\tilde{j}i^4 ja^4 ji^4e^2ma^3 i^4 = de^3i^3a^3 = tja^1\tilde{i}^1 -e^3$   
 3.I.SBJ.MC.A = stand.up NCL:I/II DNOM.ANA:I 3.I.SBJ.SC.I = talk = want -NMLZ.I

'Anyone who wants to talk, stand up.' (GE.MFC.20160802 based on OS 20160731)

Speakers also employ Class I agreement when they wish to refer to a known set of animate beings, but without identifying them. Such a situation can arise because the speaker lacks the evidence necessary to identify the referents (120a) or because the identity of the referents is not topical in the discourse (120b). One reason not to identify a referent is that one is not sure that the addressee can identify them. This may underlie the Class I agreement in (120b), since the speaker is addressing me and I would not be able to identify the people referred to (because I do not know them).

(120) Class I agreement for unidentifiable human referents

- a. Speaker has insufficient evidence to identify referent

*ji<sup>31</sup>ʔe<sup>2</sup>ma<sup>4</sup> i<sup>5</sup>ta<sup>4</sup>ŋu<sup>3</sup> ri<sup>1</sup> ma<sup>3</sup>ri<sup>3</sup> ti<sup>31</sup>ʔi<sup>3</sup> tʃa<sup>3</sup>dau<sup>2</sup>.*

*ji<sup>31</sup>ʔe<sup>2</sup>ma<sup>4</sup> i<sup>5</sup>= ta<sup>4</sup>= ŋu<sup>3</sup> ri<sup>1</sup> ma<sup>3</sup>ri<sup>3</sup> ti<sup>31</sup> = ʔi<sup>3</sup> tʃa<sup>3</sup>=*  
 DNOM.ANA:I DIR = 3.I.SBJ.MC.A = arrive and now 3.I.PRO = ACC 1SG.SBJ.MC.A =  
 dau<sup>2</sup>  
 see

'I just saw someone arrive (but I don't know who).' (GE.MFC.20160802)

- b. Referent is potentially identifiable, but not actually identified

*ki<sup>3</sup>ʔtʃi<sup>3</sup>tu<sup>1</sup>ki<sup>1</sup>ā<sup>1</sup>...ta<sup>4</sup>ma<sup>3</sup> na<sup>3</sup>ja<sup>3</sup>ʔō<sup>2</sup> ja<sup>4</sup> na<sup>4</sup> na<sup>1</sup>ta<sup>31</sup>ʔi<sup>4</sup> ga<sup>4</sup> gu<sup>2</sup>ma<sup>4</sup> mū<sup>2</sup>ki<sup>3</sup>. ri<sup>1</sup> na<sup>4</sup>a<sup>3</sup>na<sup>3</sup>ki<sup>2</sup>gu<sup>2</sup> ti<sup>4</sup>ʔi<sup>2</sup>gi<sup>4</sup>a<sup>1</sup>ne<sup>1</sup>.*

*ki<sup>3</sup>ʔtʃi<sup>3</sup>tu<sup>1</sup> = ki<sup>1</sup>ā<sup>1</sup> ta<sup>4</sup>ma<sup>3</sup> na<sup>3</sup>= ja<sup>3</sup>= ō<sup>2</sup> ja<sup>4</sup> na<sup>4</sup>*  
 place.name = people.from NEG 3.IV.SBJ = 3.OBJ = believe NCL:II COMP  
*na<sup>1</sup>= ta<sup>43</sup> -ʔi<sup>4</sup> ga<sup>4</sup> gu<sup>2</sup>ma<sup>4</sup> mū<sup>2</sup>ki<sup>3</sup> ri<sup>1</sup> na<sup>4</sup>-*  
 3.NonI.SBJ.SC.A = be.big -SUB PST DNOM.ANA.PST:II rainy.season and 3.IV.POSS-  
*\*a<sup>3</sup>na<sup>3</sup>ki<sup>2</sup> = gu<sup>2</sup> ti<sup>4</sup>= i<sup>2</sup> = gi<sup>4</sup> \*a<sup>1</sup>ne<sup>1</sup>*  
 \*bank = LOC 3.I.SBJ.SC.I = make = PL \*NI:garden

'The Cushillocochanos (Class IV) did not believe that it was going to be a heavy rainy season, and so some people (Class I) made gardens on the banks (of lakes and rivers).'

(MFC, mkn 0:27)

### 10.3 Conveying social deixis: Classes II and IV to Class I

121 illustrates that *o<sup>1</sup>ʔi<sup>5</sup>* 'old man,' though prototypically Class II, and *\*mi<sup>1</sup>ki<sup>3</sup>* 'companion,' though prototypically Class IV, can both be treated as Class I. In these examples, the Class I treatment of the non-Class I head noun conveys a socially deictic meaning. It can index that the referent is the senior partner in a kin relation with speaker or another discourse participant (121a,c). Or it may index that one of the discourse participants has a heightened emotional state toward the referent, like strong affection, pity, or romantic love (121b).

(121) Class I agreement with non-Class I nouns is acceptable

- a. *o<sup>1</sup>ʔi<sup>5</sup>* 'old man' is usually Class II : *o<sup>1</sup>ʔi<sup>5</sup> ja<sup>4</sup> ta<sup>31</sup>ki<sup>3</sup>*

*o<sup>1</sup>ʔi<sup>5</sup> ja<sup>4</sup> ta<sup>43</sup> -ki<sup>3</sup>*  
 old.man(II) NCL:II be.big -NMLZ:II

'big/important old man' (GE.LWG.20160722)

- b. But acceptable with Class I:  $\text{tau}^4 \text{?e}^3 \text{ta}^1 \text{?}^1 \text{ri}^5 \text{ri}^1 \text{tfo}^{31} \text{?i}^3 \text{Lima-wa}^5 \text{ta}^4 \text{mũ}^2$   
 $\text{tau}^4 \quad \text{-?e}^3 \quad \text{ta}^1 \quad \text{?}^1 \text{ri}^5 \quad \text{ri}^1 \quad \text{tfo}^{31} = \text{?i}^3 \quad \text{Lima} = \text{wa}^5 \text{ta}^4 =$   
 NEG.EXIST -NMLZ:I also old.man(II) TOP 1SG = ACC Lima = ALL 3.I.SBJ.MC.A =  
 $\text{mũ}^2$   
 send.animate  
 'My deceased grandfather, he sent me to Lima.' (ECG, ebu 4:31)
- c.  $*\text{mi}^1 \text{ki}^3$  'companion' is usually Class IV:  $\text{ni}^{31} \text{ma}^2 \text{i}^4 \text{tfo}^1 \text{mi}^1 \text{ki}^3$   
 $\text{ni}^{31} \text{ma}^2 \text{i}^4 \quad \text{tfo}^1 \text{-} \text{*mi}^1 \text{ki}^3$   
 3.NonI NCL:IV 1SG- \*companion(IV)  
 'him, my companion' (GE.LWG.20160722)
- d. But acceptable with Class I:  $\text{ti}^{31} \text{ma}^2 \text{ja}^4 \text{tfo}^1 \text{mi}^1 \text{ki}^3$   
 $\text{ti}^{31} \text{ma}^2 \text{ja}^4 \quad \text{tfo}^1 \text{-} \text{*mi}^1 \text{ki}^3$   
 3.I NCL:I/II 1SG- \*companion(IV)  
 'him, my fiancé' (GE.LWG.20160722)
- e.  $\text{pa}^3 \text{pa}^5$  'father' also acceptable with Class I:  $\text{tfo}^{31} \text{ri}^3 \text{pa}^3 \text{pa}^5 \text{ri}^1, \text{ka}^4 \text{ri}^4 \text{gi}^4 \text{wa}^5 \text{ta}^4 \text{pu}^3 \text{ra}^3 \text{ki}^4$ .  
 $\text{tfo}^{31} \text{ri}^3 \quad \text{pa}^3 \text{pa}^5 \quad \text{ri}^1 \quad \text{ka}^4 \text{ri}^4 \quad = \text{gi}^4 = \text{wa}^5 \text{ta}^4 = \quad \text{pu}^3 \text{ra}^3 \text{ki}^4$   
 1SG.AL.POSS father(II) TOP rubber.tree = PL = ALL 3.I.SBJ.MC.A = work  
 'My father, he (Class I) was working rubber.' (NWG, nbu 0:54)

In discourse as in (121b), speakers very consistently use Class I agreement in referring to their consanguineal relatives of G + 1 and older generations, i.e. parents, grandparents, and kin classified as belonging to the parents' or grandparents' generation. While use of Class I agreement to refer to kin of these categories is much more common than use of non-Class I agreement, it is not obligatory in either a social or grammatical sense. When I have played speakers recordings of sentences that refer to senior consanguineal kin with non-Class I agreement, they do not spontaneously volunteer comments that the sentences are impolite. If asked about the agreement, though, they will say that Class I agreement would be more appropriate.

It is also common for speakers to use Class I agreement when referring to the senior consanguineal relatives of addressees and/or other discourse participants. For example, speakers who are talking about my father to one another while I am present typically refer to him using Class I agreement, even when they are not addressing me or reporting my speech. This suggests that use of Class I agreement with non-Class I nouns indexes the existence of a junior-senior kinship relation between *at least one of the discourse participants* -- including, but not necessarily, the speaker -- and the referent.

Class I agreement is *not* an index of respect relationships other than senior-to-junior kinship relations. For example, most CT speakers display respect to teachers and people with other kinds of official government positions in various ways, such as avoiding their gaze, avoiding their names, and -- when they do use personal names -- using an occupational title preceding the name. But speakers do not use Class I agreement to refer to teachers and other officials unless one of the other conditions for Class I agreement is met (i.e. the referent is a woman or a senior relative of a discourse participant). Christians also do not generally use Class I agreement to refer to God and Jesus.

As (121d) suggests, though, use of Class I agreement with non-Class I nouns does not *exclusively* index senior-to-junior kinship relations. In addition to the kinship use, it can also function as an

index of the speaker's affective stance toward the referent. For example, speakers tend to use Class I agreement in reference to babies and small children, very old people, the protagonists of myths, and people who are being treated with exceptional care or pity in a specific discourse context. I observed an instance of this final use of Class I agreement while attending an evangelical Christian church service in Cushillococha on July 14, 2016. During this service, the pastor of the church (speaking in Spanish) pointed out a man who was attending the church for the first time in the audience, and announced that although previously the man, K, had been known as a drunk and a thief, he had decided to change his ways and become a member of the church. The pastor then called K forward and made him kneel in front of the pulpit, where several senior men and one senior woman from the church's committee of deacons surrounded K in a circle and prayed (in CT, but not loud enough to be consistently audible), cried, and wailed over him for about twenty minutes. At the end of this event, the senior woman who had been in the circle, ECG, took the pulpit and delivered a short speech in CT about how members of the congregation should now behave toward K. She explained that they should visit him and offer to pray with him. Since K is male and junior to ECG and all of the focal addressees of this discourse, ECG would normally refer to him using Class II or Class IV agreement. However, throughout this speech, she referred to him exclusively using Class I agreement, indexing his status as the object of intense emotion in the immediately preceding activity.

(122) provides an example of a similar affective use of Class I agreement in reference to the protagonist of a myth. Class I agreements are underlined in the example.

(122) Affective use of Class I agreement

Context: Story of two boys lost in the forest. Both boys are referred to with Class II or Class IV agreement until this passage.

ŋi<sup>1</sup>ri<sup>3</sup> ta<sup>4</sup>tu<sup>1</sup>ra<sup>3</sup>ŋi<sup>4</sup>, ri<sup>4</sup> ta<sup>4</sup>ju<sup>2</sup>. ŋe<sup>5</sup>ma<sup>2</sup> ti<sup>31</sup>ŋi<sup>3</sup> na<sup>1</sup>ta<sup>5</sup>ŋi<sup>4</sup>, ŋe<sup>4</sup>ŋu<sup>2</sup>ma<sup>3</sup> ja<sup>4</sup> ji<sup>31</sup>ŋe<sup>2</sup>ma<sup>4</sup> na<sup>4</sup>mĩ<sup>1</sup>ki<sup>3</sup>, ja<sup>4</sup> ji<sup>31</sup>ŋe<sup>2</sup>ma<sup>4</sup> ma<sup>3</sup>ri<sup>3</sup> ju<sup>2</sup>e<sup>3</sup>.

ŋi<sup>1</sup>ri<sup>3</sup> ta<sup>4</sup>= tu<sup>1</sup>ra<sup>1</sup> -ŋi<sup>4</sup>, ri<sup>4</sup> ta<sup>4</sup>= ju<sup>2</sup> ŋe<sup>5</sup>ma<sup>2</sup> ti<sup>31</sup> = ŋi<sup>3</sup>  
 suddenly 3.I.SBJ.A = be.weak.A -SUB and 3.I.SBJ.A = die.A DLOC.ANA 3.I = ACC  
 na<sup>1</sup> = ta<sup>1</sup> -ŋi<sup>4</sup>, ŋe<sup>4</sup>ŋu<sup>2</sup>ma<sup>3</sup> ja<sup>4</sup> ji<sup>31</sup>ŋe<sup>2</sup>ma<sup>4</sup> na<sup>4</sup>- \*mĩ<sup>1</sup>ki<sup>3</sup>  
 3.II.SBJ.A = discard.A -SUB so.NPST NCL:I/II DNOM.ANA:I 3.III/IV- \*companion  
 ja<sup>4</sup> ji<sup>31</sup>ŋe<sup>2</sup>ma<sup>4</sup> ma<sup>3</sup>ri<sup>3</sup> ju<sup>2</sup> -e<sup>3</sup>  
 NCL:I/II DNOM.ANA:I now die -NMLZ:I

'Suddenly he<sub>i</sub> (Class I) got weak, and he<sub>i</sub> died. He<sub>j</sub> (Class IV) left him<sub>i</sub> there, thus, him<sub>i</sub>, his<sub>j</sub> companion, he<sub>i</sub> who had just died.' (MFC, dau 6:44)

To summarize, Class I agreement with typically non-Class I nouns has two possible social deictic values. It may index either (a) senior-to-junior kinship relations between the referent of the noun and one or more of the discourse participants, or (b) the speaker's positive affective stance toward the referent of the noun.<sup>8</sup> Class I agreement can be and actually is used with these values both when the referent is also the addressee -- for example, I have heard speakers use Class I agreement with second-person reference when speaking to small children (113b) -- and when the referent is not the addressee or not present. The use of Class I agreement in the addressee's absence, like the other examples discussed above, makes clear that the 'politeness' dimension of Class I agreement is discernment politeness rather than volitional politeness (Ide 1989).

<sup>8</sup>I find it more likely that (b) actually indexes a positive stance by any participant, as with (a), but I do not have the examples necessary to show this.

Note that because this socially deictic meaning derives from the Class I treatment of a noun that is prototypically *not* Class I, it is available only in speaking of men and boys. Nouns referring to women and girls are prototypically Class I, and therefore treating them as Class I does not lead to the readings outlined above. For example, on June 6, 2016, I went to look for LCS at his workplace, the Cushillococha high school. In the course of this errand, I asked some women who were sitting outside of the school where LCS was, speaking in CT. After they told me he was not there, I began to walk away and heard one of them exclaim to the other,  $t\acute{i}^{31}ma^2 t\acute{i}^4de^{31}ʔa^2$  'she (Class I) talks!.' There is no feasible social deictic reading of this use of Class I. The same could be said of several dozen more similar examples, in my data, of people commenting on the behavior of anonymous women to whom they have no affective or kin relationship.

#### 10.4 Conveying social deixis: Class I to $\eta i^1$ - paradigm

Animate nouns in Class I can be skewed into a unique agreement paradigm. In this paradigm, a prototypically Class I noun can behave in one of two ways. In one pattern, it takes Class I agreement on nominal deictics and noun class particles, but has *Class II* agreement on nominalizations, and displays anaphora with a dedicated pronoun  $\eta i^1$ - 3F. In the other pattern, the noun still takes the pronoun  $\eta i^1$ - and Class II agreement on nominalizations, but takes Class IV agreement on nominal deictics and particles. At least some Class IV nominal deictics display a different tone when they modify a noun phrase with this agreement pattern than when they modify an underlyingly Class IV noun phrase. For example, the past general demonstrative is 4.4  $je^4ma^4$  when it modifies an underlyingly Class IV noun, but 4.2  $je^4ma^2$  when it modifies an underlyingly Class I noun that has been skewed in this way.

This agreement pattern occurs most often with lexicalized deverbal nominalizations that are formally Class II, but refer to grammatically animate, prototypically Class I entities. Examples of such nominalizations include  $pa^1ki^3$  'young woman' (<  $pa^4$  'be an unmarried adult woman') and  $dau^2ki^3$  'mirror' (<  $dau^2$  'see'). Except with these nominalizations, I have very few examples of this agreement in any form of data, despite going to some lengths to elicit it and encourage consultants to produce it in texts.

Almost all of the textual examples of this agreement pattern are in myths, but there are a handful in personal narratives. In these, speakers seem to use the  $\eta i^1$ - agreement pattern to refer only to women who are in the same generation as them, as in (123), or in a younger generation. Yet it is also possible to refer to these same referents with Class I agreement. For example, in (123), DGG refers to his wife with the  $\eta i^1$ - agreement, but on many other occasions I heard him refer to her with Class I agreement.

(123)  $ri^1 \eta i^{43}e^4na^1 ri^1 \eta i^{21} ja^4na^4gi^3ri^1 ga^4 \eta i^{43}e^4 ri^1 \eta i^{43}na^4ti^3 ri^1$ .

$ri^1 \eta i^{43}$ - \* $e^4$  - $na^1 ri^1 \eta i^{21} ja^4$ =  $na^4 = gi^3ri^1 ga^4$   
 and 3.F \*mother(I) and proposal.yes QUOT = 3.NonI.SBJ.MC.A = QUOT NCL:PST 3.F  
 $\eta i^{43}$ - \* $e^4 ri^1 \eta i^{43}$ - \* $na^4ti^3 ri^1$   
 \*mother(I) and 3.F \*father and

'And (I asked) her ( $\eta i^1$ ) mother (if I could marry her), and her ( $\eta i^1$ ) mother and her ( $\eta i^1$ ) father said yes.' (DGG, leo 0:41)

On many occasions when I tried to elicit the  $\eta i^1$ - agreement pattern, speakers found sentences that I constructed with the  $\eta i^1$ - agreement paradigm to be funny but not ungrammatical. They did not react in this way to other forms of noun class skewing, and I am not sure what to make of it. One possible explanation is that the agreement pattern encodes some kind of social deixis that is not congruent with the elicitation setting. For example, it might encode something about the addressee's relationship with the referent, and therefore be infelicitous when speakers are addressing me.

## 10.5 Conveying information status: Classes I, II, III to Class IV

All non-Class IV nouns can also be treated as Class IV, receiving Class IV agreement on all agreement targets. (124) provides examples of Class IV agreement with nouns of each class, including inanimate nouns. Nouns which are underlyingly Class IV, on the other hand, cannot receive agreement for any other noun class (125).

(124) Class IV agreement with non-Class IV nouns is acceptable

- a. Class I animate (GE.LCS.20160722):  
*no<sup>31</sup>ẽ<sup>3</sup> ja<sup>4</sup> me<sup>31</sup>e<sup>3</sup>* (old.woman(I) NCL:I/II be.good-NMLZ.I) 'good grandmother'  
*no<sup>31</sup>ẽ i<sup>4</sup> me<sup>31</sup>ĩ<sup>4</sup>* (old.woman(I) NCL:IV be.good-NMLZ.IV) 'good grandmother'
- b. Class I inanimate (GE.DGG.20160803):  
*i<sup>1</sup>ru<sup>5</sup> ja<sup>4</sup> do<sup>31</sup>e<sup>3</sup>* (plantain.var(I) NCL:I/II be.soft-NMLZ.I) 'soft *guineo* plantain'  
*i<sup>1</sup>ru<sup>5</sup> i<sup>4</sup> do<sup>31</sup>ĩ<sup>4</sup>* (plantain.var(I) NCL:IV be.unripe-NMLZ.IV) 'unripe *guineo* plantain'
- c. Class II inanimate (GE.DGG.20160803):  
*tfe<sup>3</sup>ra<sup>1</sup> ja<sup>4</sup> te<sup>5</sup>ki<sup>3</sup>* (saw(II) NCL:II be.sharp-NMLZ.II) 'sharp saw'  
*tfe<sup>3</sup>ra<sup>1</sup> i<sup>4</sup> te<sup>5</sup>ĩ<sup>4</sup>* (saw(II) NCL:IV be.sharp-NMLZ.IV) 'sharp saw'
- d. Class III (GE.DGG.20160803):  
*ɲu<sup>31</sup>e<sup>3</sup> ja<sup>2</sup> ma<sup>5</sup>ĩ<sup>4</sup>ne<sup>1</sup>* (canoe(III) NCL:III be.long-NMLZ.III) 'long canoe'  
*ɲu<sup>31</sup>e<sup>3</sup> i<sup>4</sup> ma<sup>5</sup>ĩ<sup>4</sup>* (canoe(III) NCL:IV be.long-NMLZ.IV) 'long canoe'

(125) Non-Class IV agreement with Class IV nouns is unacceptable

- a. Class I unacceptable: \**wi<sup>43</sup>i<sup>4</sup>e<sup>3</sup> ja<sup>4</sup> ta<sup>3</sup>ra<sup>5</sup>* (one-NCL:I/II NCL:I/II machete(IV)), intended: 'one machete' (GE.LCS.20160721)
- b. Class II unacceptable: \**ji<sup>2</sup>ma<sup>4</sup> ta<sup>3</sup>ra<sup>5</sup>* (DNOM.ANA:II machete(IV)), intended: 'that machete' (GE.LWG.20160803)
- c. Class III unacceptable: \**da<sup>1</sup>a<sup>1</sup> u<sup>3</sup>i<sup>1</sup>* (DNOM.PROX:III manioc.flour(IV)), intended: 'this toasted manioc flour (take it!)' (GE.LCS.20160722)

Consultants do not have clear glosses on the meaning of Class IV agreement with underlyingly non-Class IV nouns. Sometimes they say that it conveys disrespect for the referent of the noun or the other discourse participants, especially with underlyingly Class I nouns. At other times, they say there is no meaning difference between the underlying and Class IV agreement. Textual examples suggest that Class IV agreement occurs when a noun is informationally backgrounded, that is, when it is neither topic nor focus, but this is not exceptionless. More corpus work is necessary to clarify.

## 11 Case and other nominal morphology

The nominal morphology of in CT can be divided into three categories: noun class agreement morphology, case morphology, and non-inflectional nominal morphology. I discussed noun class agreement in §9. In this section, I describe case and nominal derivational morphology. I begin by sketching the phonological, morphosyntactic, and semantic properties of the language's case system (§11.1). Case markers induce extensive, sometimes non-local suppletive allomorphy on pronouns. I describe this in §11.2. Then, in §11.3, I consider non-inflectional, non-agreement morphology which can appear on nouns. These include number markers, nominal tense markers, and a small number of other morphs.

### 11.1 Nominal case markers

CT displays eight cases. Three -- the nominative, accusative, and intransitive beneficiary cases -- encode only grammatical relations. Two can encode grammatical relations, but also often encode spatial relations. These are the recipient case and the transitive beneficiary or purposive case. Three cases primarily encode spatial relations. These primarily spatial cases are the comitative/instrumental, locative, allative. Below, I describe the cases in this same order, from the most grammatical to the most spatial.

All case markers are enclitics. Like all other nominal enclitics, they encliticize to the last element of the noun phrase and form a single Prosodic Word with it. Evidence that case markers form a single Prosodic Word with the base is that they trigger the lexical phonological process of tone dissimilation and the postlexical but word-bounded phonological process of nasal spreading. Evidence that they are clitics rather than affixes is that (a) when a complex noun phrase is case-marked, the case marker appears only on the final element, and (b) when a conjoined noun phrase is case-marked, the case marker appears only on the second conjunct, as in (126). There is no case concord.

(126) Comitative case appears only on second conjunct in conjoined noun phrase  
*mũ<sup>3</sup>ka<sup>3</sup>wa<sup>1</sup> ri<sup>1</sup> ta<sup>3</sup>ra<sup>5</sup>ma<sup>4</sup>?ã<sup>3</sup> na<sup>41</sup>mq<sup>1</sup>.*

*mũ<sup>3</sup>ka<sup>3</sup>wa<sup>1</sup> ri<sup>1</sup> ta<sup>3</sup>ra<sup>5</sup> = ma<sup>4</sup>?ã<sup>3</sup> na<sup>41</sup> = ma<sup>1</sup>*  
 shotgun and machete = COM/INST 3.NonI.SBJ>3.NonI.OBJ.MC.I1 = kill

'He killed it with a shotgun and a machete (i.e. by shooting it and then finishing it off with a machete blow).' (GE.LCS.20160621)

Case markers differ from other enclitics in several ways. One is that, in most cases, speakers are not able to attribute them a meaning in isolation. Some consultants, especially LCS, can sometimes gloss the primarily spatial case markers, but no one can gloss the primarily grammatical case markers, such as the accusative. By contrast, speakers generally can gloss other clitics in isolation, even though they are not grammatically acceptable without a host. Second, case causes suppletive allomorphy on pronouns (§11.2), while other clitics do not cause suppletive allomorphy. And third, case must be ordered outside of inalienable possessa, while other clitics attaching to noun phrases can be ordered either inside or outside of inalienable possessa. Case is also typically ordered outside of number, but this is not obligatory (§11.2).

Beyond the restriction on the ordering of case and inalienable possessa, the relative ordering of case with other clitics appears to reflect scope. Take the relative ordering of the clitic =*ma<sup>3</sup>re<sup>3</sup>* 'just, plain old' and the comitative/instrumental case marker as an example. When case appears outside of =*ma<sup>3</sup>re<sup>3</sup>*, =*ma<sup>3</sup>re<sup>3</sup>* scopes over the case-marked noun. Thus, *o<sup>3</sup>ta<sup>3</sup>=ma<sup>3</sup>re<sup>3</sup>=ma<sup>4</sup>?ã<sup>3</sup>* (chicken=just=COM/INST) means 'with a regular chicken,' in contrast to 'with a chicken of an unusual type' (such as a fighting rooster). With the other order, =*ma<sup>3</sup>re<sup>3</sup>* scopes over both the noun and the case marker, so that *o<sup>3</sup>ta<sup>5</sup>=ma<sup>4</sup>?ã<sup>3</sup>=ma<sup>3</sup>re<sup>3</sup>* (chicken=COM/INST=just) means 'with just a chicken,' in contrast to 'with something more unusual than a chicken' (GE.LCS.20160630).

### 11.1.1 Nominative case

The nominative case appears on all subjects. Understanding the syntactic role of subject requires some understanding of transitivity and semantic roles in the language. All non-psychological predicates in CT can be defined as either transitive or intransitive. (Cross-linguistically labile verbs such as 'break' and 'burn' are syntactically intransitive.) Psych predicates -- emotion, perception, and cognition verbs such as *dau<sup>2</sup>* 'see,' *ɲe<sup>5</sup>tʃa<sup>1</sup>i<sup>1</sup>* 'love; miss; be sad,' and *i<sup>3</sup>ni<sup>3</sup>* 'hear; understand; think' -- are ambitransitive. I define the subject as (a) the single argument of a non-psych intransitive verb (S), (b) the more agentive argument of a non-psych transitive verb (A), and (c) the experiencer argument of a psych predicate (E). The subject can also be defined syntactically as the argument which triggers the subject proclitic agreement on the predicate.

Nominative case is zero-marked on referential nouns and non-pronominal deictics. When free pronouns appear as subjects, however, they cannot be zero-marked. Instead, the pronominal stem typically bears an element =*ma<sup>2</sup>*. While this could be taken as evidence that =*ma<sup>2</sup>* is an overt morphological marker of nominative case on pronouns, I argue in §11.2 that this element is introduced to fulfil prosodic minimality requirements and does not mark nominative case. That is, nominative case is zero on all noun phrases.

Some noun phrases which are not subjects also fail to bear overt case marking. Zero-marking of non-nominative noun phrases occurs in four contexts. First, left-edge topics are zero-marked. Left-edge topics are noun phrases which appear at the left edge of the clause and are immediately followed by the left-edge topic marker *ri<sup>1</sup>*. They may be coreferential with any noun phrase in the clause, including a noun phrase that is neither an argument nor an adjunct (e.g. a possessor of an argument); or they may fail to be coreferential with an overt argument, as in (95). Regardless of the case on the noun phrase within the clause, though, the coreferential left-edge topic noun phrase is zero-marked. Second and likely related, all postverbal noun phrases are zero-marked. I explore this generalization in more detail for the accusative case below. Third, the direct object can be zero-marked, even when it is in its underlying syntactic position, as a result of differential object marking (§11.1.2). Fourth, locative deictics have limited possibilities for case marking. I analyze this as reflecting the morphological features of the deictics in §11.1.8.

### 11.1.2 Accusative case

The accusative case appears on objects. I define the object as (a) the less agentive argument of a non-psych transitive verb (O) or (b) the stimulus argument of a psych predicate (St). For verbs of the *a*, *i<sup>3</sup>*, and *i<sup>1</sup>* classes, the object can also be defined syntactically as the argument which

can potentially be replaced by an object proclitic on the predicate. The morphological marker of accusative case, for all form classes of nouns, is =ʔi<sup>3</sup>.

Three factors interact to determine whether a noun phrase that has the semantic role of O or St actually bears the morphological accusative case. These are (a) the syntactic position of the object noun phrase, (b) the lexical semantics of the predicate, and (c) the relative positions of the object and subject on an animacy hierarchy. In overview, the syntactic position of the object is the single most important factor in determining whether it bears the accusative. Only an object in immediately preverbal position can have the accusative. Objects which appear in other positions cannot bear the accusative. Provided that an object is in the preverbal position, whether it actually bears the accusative is then determined by the lexical semantics of the predicate and by the animacy hierarchy.

**Syntactic position of the object** The basic constituent orders in CT are SV and SOV. I do not propose these as the basic orders because consultants use them to translate SV and SVO Spanish sentences in elicitation (although they do), or because they are the most common in discourse (although they probably are), but because morphology and syntax show clearly that the object can only be assigned accusative case when it immediately precedes a verb.

There are three pieces of evidence in support of an immediately preverbal position for the object. First, modulo lexical semantics and the animacy hierarchy, direct objects receive accusative marking if, and only if, they are immediately preverbal. Second, a direct object which moves to any other position leaves behind an overt trace, in the form of a pronoun, in the immediately preverbal position. And third, a direct object which moves to be postverbal is obligatorily introduced by a noun class particle. Since the first and second of these points bear on the accusative, I discuss them in detail here.

I exemplify the syntactic restrictions on accusative case using the verb *dau*<sup>2</sup> 'see.' Because of the lexical semantics of this verb (cf. below), it obligatorily assigns the accusative case to its object regardless of the object's animacy. (127a,b) demonstrate that *dau*<sup>2</sup> assigns the accusative case to a preverbal direct object, *ã*<sup>2</sup> 'mosquito,' regardless of whether the object is definite (127a) or indefinite (127b). The absence of accusative makes the sentence ungrammatical.

(127) Accusative is obligatory on preverbal direct object

a. *ã*<sup>2</sup>ʔi<sup>3</sup> tʃa<sup>3</sup>dau<sup>2</sup>, cf: \**ã*<sup>2</sup> tʃa<sup>3</sup>dau<sup>2</sup>

*ã*<sup>2</sup> = ʔi<sup>3</sup> tʃa<sup>3</sup>- dau<sup>2</sup>  
mosquito = ACC 1SG.SBJ.MC.A- see

'I saw the mosquito (context: there is exactly one known mosquito in the mosquito net with me; I am trying to kill it).' (GE.DGG.20160622)

b. *wi*<sup>43</sup>ʔi<sup>4</sup> i<sup>4</sup> *ã*<sup>2</sup>ʔi<sup>3</sup> tʃa<sup>3</sup>dau<sup>2</sup>, cf: \**wi*<sup>43</sup>ʔi<sup>4</sup> i<sup>4</sup> *ã*<sup>2</sup> tʃa<sup>3</sup>dau<sup>2</sup>

*wi*<sup>43</sup>ʔi<sup>4</sup> i<sup>4</sup> *ã*<sup>2</sup> = ʔi<sup>3</sup> tʃa<sup>3</sup>- dau<sup>2</sup>  
one NCL mosquito = ACC 1SG.SBJ.MC.A- see

'I saw a mosquito.' (GE.DGG.20160622)

When the direct object from (127a) or (127b) is moved to a position that is not immediately preverbal, it leaves behind a trace, in the form of a pronoun, in the immediately preverbal position (128a). The preverbal pronoun is obligatory (128b), resulting in a surface SOVO sentence. In

the SOVO structure, the two objects must be co-referential, the preverbal object (i.e. the trace pronoun) must be case-marked, and the postverbal object cannot be case-marked (128c). The impossibility of accusative marking on the postverbal object is due to its syntactic position, not solely to the fact that the trace pronoun has already saturated the argument structure of the verb. The evidence for this is that a VO structure with a postverbal accusative and no trace pronoun is also ungrammatical (128d).

(128) Preverbal accusative trace pronoun is obligatory with postverbal direct object

- a.  $ni^{31}\tilde{\eta}^3_i tja^3dau^2 i^4 \tilde{a}^2_i$ .  
 $ni^{31} = \tilde{\eta}^3 tja^3- dau^2 i^4 \tilde{a}^2$   
 3.NonI.PRO = ACC 1SG.SBJ- see NCL:IV mosquito  
 'I saw the mosquito.' (GE.DGG.20160622)
- b.  $*tja^3dau^2 i^4 \tilde{a}^2$
- c.  $*ni^{31}\tilde{\eta}^3 tja^3dau^2 i^4 \tilde{a}^2\tilde{\eta}$
- d.  $*tja^3dau^2 i^4 \tilde{a}^2\tilde{\eta}^3$

The pattern displayed in (128) obtains for all verbs which consistently assign the accusative, regardless of the definiteness and animacy of the object. A parallel pattern also occurs if the object is moved to the left edge of the sentence in topicalization: the topic NP cannot be marked with the accusative, and it must leave an accusative trace in preverbal position.

Any verb which obligatorily assigns the accusative, like *dau*<sup>2</sup> 'see,' requires that an object which moves from preverbal position leave some preverbal trace. The morphological form of the trace, however, varies according to (a) the person and noun class features of the object and (b) the object's thematic role. If the object is a first or second person pronoun, or if it is a Class I noun phrase, then the trace must be realized as a phonologically free pronoun with the accusative case. If it is a non-Class I third person pronoun, it can be realized either as a phonologically free pronoun or as an object proclitic on the verb. Which of these possibilities actually occurs depends on the thematic role of the object. If the object has the thematic role of patient, it is in general realized as an object proclitic; if it has the thematic role of theme or stimulus, it is realized as a free pronoun with accusative case. There are some verbs, such as *mq*<sup>1</sup> 'hit, kill,' which alternate between marking the object as a proclitic and as a free pronoun. I assume that this reflects the event structure of the relevant verbs.

**Semantics of the verb.** In addition to the syntactic restrictions, the assignment of accusative case is restricted by semantic properties of the verb and its object.

The accusative case behavior of a transitive verb is largely determined by whether or not it is a psych predicate. Most, possibly all, psych predicates can be used with several different case frames. For example, (129) shows that the psych verb  $\eta e^5 tja^1 \tilde{i}^1$  can be used as intransitive (129a), as a quirky case predicate assigning the purposive case to the object (129b), or as a transitive predicate assigning the accusative case to the object (129c). Each of these case frames leads to a different reading or set of readings for the verb (though the meanings are surely more related than their English glosses indicate).

(129) Possible case frames with the psych verb  $\eta e^5 tja^1 \tilde{i}^1$

- a. Intransitive predicate  
*tʃa³ɲe⁵tʃa¹ĩ¹*  
*tʃa³ =                    ɲe⁵tʃa¹ĩ¹*  
 1SG.SBJ.MC.A = emotion.verb  
 'I'm sad.'
- b. Quirky case predicate, purposive on object  
*tʃo³ri³ ma³ma⁵ka¹ tʃa³ɲe⁵tʃa¹ĩ¹*  
*tʃo³ri³            ma³ma⁵ = ka¹    tʃa³ =                    ɲe⁵tʃa¹ĩ¹*  
 1SG.AL.POSS mother = PURP 1SG.SBJ.MC.A = emotion.verb  
 'I'm lonely for my mother.' (GE.LCS.20160715)
- c. Transitive predicate, accusative on object  
*Ka³ru¹ne³ĩ³ tʃa³ɲe⁵tʃa¹ĩ¹*  
*Ka³ru¹ \*ne³ = ɲĩ³    tʃa³ =                    ɲe⁵tʃa¹ĩ¹*  
 K        son = ACC 1SG.SBJ.MC.A- emotion.verb  
 i. 'I love Carlos' son (romantically or as a family member).'  
 ii. 'I treat Carlos' son right (my behavior toward him is morally good).' (GE.SSG.20160716)

Whenever a psych predicate is used in a transitive frame, as in (129c), it must assign an overt accusative case marker to its object. The object's word class and position on the animacy hierarchy are irrelevant. With most non-psych verbs, on the other hand, accusative is assigned only if the animacy and word class criteria outlined below are met.

In the following, I use the term 'invariant accusative verb' as a cover term for all verbs and senses of verbs which assign the accusative case without regard for the animacy hierarchy. This is necessary because there are some non-psych transitive verbs, such as *kʷe¹* 'blow on something; shoot,' and *ma¹* 'hit; kill,' which sometimes behave like psych verbs in obligatorily assigning the accusative regardless of the object's properties. Specifically, *kʷe¹* in the meaning 'shoot' and *ma¹* in the meaning 'hit' assign the accusative without regard for the animacy hierarchy, while *kʷe¹* in the meaning 'blow on something' and *ma¹* in the meaning 'kill' assign the accusative only if the object satisfies the animacy hierarchy rules for accusative marking. I assume that this is related to the polysemy of these verbs.

**The animacy hierarchy** Suppose that we have an object which is in the syntactic position to receive the accusative, and that it is the object of a verb which is not an invariant accusative verb. In this situation, whether the object actually receives overt accusative case depends on (a) its word class and (b) its position relative to the subject on an animacy hierarchy.

The word class criterion is simple: if the object is a pronoun, it must be marked with the accusative. If it is a referential noun or a nonpronominal deictic, the marking depends on the animacy hierarchy. The animacy hierarchy for CT is shown in (130).

- (130) Animacy hierarchy for accusative case assignment  
 Human > All other grammatically animate nouns (animals, inanimate animates) > Inanimate

When the subject of a transitive outranks the object on the animacy hierarchy, it is ungrammatical to mark the object with the accusative (131, 132).

(131) Human subject, inanimate object: accusative ungrammatical (GE.DGG.20160622)

a. Zero-marked object acceptable: *ni<sup>31</sup>ma<sup>3</sup> na<sup>31</sup>pa<sup>1</sup> na<sup>4</sup>mu<sup>3</sup>*

ni<sup>31</sup> -ma<sup>3</sup> na<sup>43</sup>- pa<sup>1</sup> na<sup>4</sup>= mu<sup>3</sup>  
 3.NonI.PRO -TOP DEF.POSS- hammock 3.NonI.SBJ.MC.A = weave  
 'He weaves the hammock.'

b. Accusative unacceptable: *\*ni<sup>31</sup>ma<sup>3</sup> na<sup>4</sup>pa<sup>3</sup>ɽ<sup>3</sup> na<sup>4</sup>mu<sup>3</sup>*

(132) Human subject, non-human animate object: accusative ungrammatical (GE.DGG.20160622)

a. Zero-marked object acceptable: *tfo<sup>43</sup>?ni<sup>5</sup> tfa<sup>3</sup>ηō<sup>1</sup>*

tfo<sup>43</sup>?ni<sup>5</sup> tfa<sup>3</sup>= ηō<sup>1</sup>  
 fish 1SG.SBJ.MC.A = eat  
 'I eat fish.'

b. Accusative unacceptable: *\*tfo<sup>43</sup>?ni<sup>5</sup>ɽ<sup>3</sup> tfa<sup>3</sup>ηō<sup>1</sup>*

When the subjects are equal on the animacy hierarchy or the object outranks the subject, accusative marking returns (133).

(133) Human subject, human object: accusative grammatical (GE.LCS.20160715)

a. *Ka<sup>3</sup>ru<sup>1</sup> tfa<sup>1</sup>ne<sup>3</sup>ɽ<sup>3</sup> ni<sup>43</sup>ga<sup>2</sup>.*

Ka<sup>3</sup>ru<sup>1</sup> tfa<sup>1</sup>- \*ne<sup>3</sup> = ɽ<sup>3</sup> ni<sup>43</sup>= ga<sup>2</sup>  
 K 1SG.POSS- son = ACC 3.NonI.SBJ.MC.I = bring/take/send.sociative  
 'Carlos is taking my son (going to a destination with him).'

b. *Ka<sup>3</sup>ru<sup>1</sup> tfa<sup>1</sup>ne<sup>3</sup>ɽ<sup>3</sup> na<sup>4</sup>mũ<sup>2</sup>.*

Ka<sup>3</sup>ru<sup>1</sup> tfa<sup>1</sup>- \*ne<sup>3</sup> = ɽ<sup>3</sup> na<sup>4</sup>= mũ<sup>2</sup>  
 K 1SG.POSS- son = ACC 3.NonI.SBJ.MC.A = bring/take/send.ANIM  
 'Carlos is sending my son.'

The animacy effect in (133) is a syntactic phenomenon, not a semantic one. The evidence for this comes from possessor raising in object incorporation. Consider (134). In the non-incorporated version of this sentence, (134a), the object refers to a nonhuman animate and the subject refers to a human. Thus, since the subject outranks the object on the animacy hierarchy and the verb is not an invariant accusative verb, the object is obligatorily zero-marked. When the object is incorporated into the verb in (134b), the human possessor of the semantic patient raises to become the syntactic object of the verb. Since the new syntactic object refers to a human, it receives the accusative. This obtains even through the sentences in (134) are identical in truth conditions, differing semantically only in information structure (which I have conveyed with italics in the glosses).

(134) Interaction of animacy effect with object incorporation (GE.LCS.20160715)

a. *Ka<sup>3</sup>ru<sup>1</sup>ɽ<sup>3</sup>na<sup>3</sup> tji<sup>31</sup>mq<sup>1</sup>.*

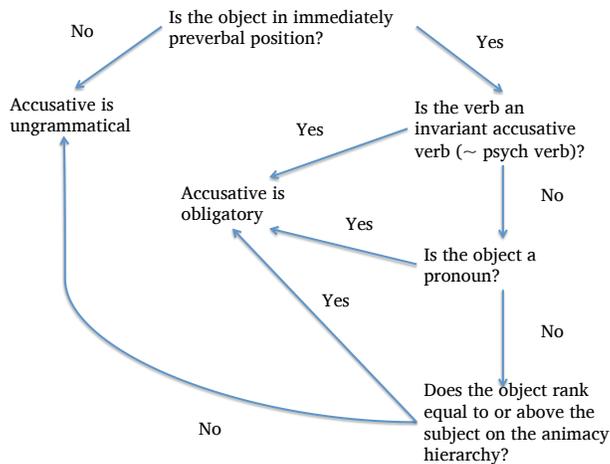
Ka<sup>3</sup>ru<sup>1</sup> \*ɽ<sup>3</sup>na<sup>3</sup> tji<sup>31</sup>= mq<sup>1</sup>  
 K \*domestic.animal 1SG.SBJ.MC.I1 = kill  
 'I killed Carlos' *domestic animal*.'

b. *Ka<sup>3</sup>ru<sup>1</sup>ɽ<sup>3</sup> tji<sup>31</sup>mq<sup>1</sup>ɽ<sup>3</sup>na<sup>3</sup>.*

Ka<sup>3</sup>ru<sup>1</sup> = ʔi<sup>3</sup> tʃi<sup>31</sup> = ma<sup>1</sup> -i<sup>3</sup>na<sup>3</sup>  
 K = ACC 1SG.SBJ.MC.I1 = kill -\*NI:domestic.animal  
 'I killed *Carlos*' domestic animal.'

As a summary of this subsection, (135) graphically represents the conditions which determine whether an object is marked with the morphological accusative.

(135) Graphical representation of conditions on differential accusative marking



### 11.1.3 Intransitive beneficiary case

The intransitive beneficiary case is a dedicated case which marks the beneficiaries and maleficiaries of intransitive verbs. Quirky case verbs -- verbs which take two arguments but assign a case other than the accusative to the non-subject argument -- also take beneficiaries with the intransitive beneficiary case. It is not clear whether derived intransitive verbs, such as antipassives, also participate in the intransitive beneficiary construction.

The intransitive beneficiary case is subject to allomorphy conditioned by the syllable count of the base of affixation. When the base is monosyllabic, the intransitive beneficiary case marker is = ʔi<sup>5</sup> (a minimal tone pair with the accusative case), but when the base is disyllabic or larger, the case marker is = a<sup>1</sup>ʔi<sup>5</sup>. On pronouns, the monosyllabic allomorph is obligatory. On referential nouns, the monosyllabic allomorph is preferred for monosyllabic nouns and the disyllabic allomorph is preferred for larger nouns, but consultants find both acceptable.

(136) provide examples of the intransitive beneficiary case with a variety of intransitive verbs that do not participate in quirky case. (137) provides an example with a quirky case verb. In all of these examples, the beneficiary noun phrase refers to an animate. Speakers judge examples with inanimate beneficiaries as grammatical, but they are appropriate only with a small number of verbs, such as o<sup>31</sup> 'be unwilling; fail to have interest in (IBEN NP).'

(136) Intransitive beneficiary case with non-quirky intransitive verbs

- a. Stative verb, beneficiary  
 tfo<sup>31</sup>ʔi<sup>5</sup> na<sup>4</sup>ja<sup>2</sup>.

tʃo<sup>31</sup> = ʔĩ<sup>5</sup> na<sup>4</sup> = ja<sup>4</sup>  
 1SG.PRO = IBEN 3.NonI.SBJ.MC.A = be.adult

'It is mature, to my benefit (speaking e.g. of a crop).' (GE.LCS.20160620)  
 Less lit.: 'Mine is mature.'

b. Unaccusative verb, beneficiary

ri<sup>1</sup> ɲe<sup>4</sup>ʔgu<sup>2</sup>ma<sup>4</sup> ti<sup>31</sup>ʔĩ<sup>5</sup> na<sup>1</sup>ɲu<sup>3</sup>ta<sup>4</sup>ke<sup>1</sup>ʔe<sup>3</sup>ʔgu<sup>2</sup> i<sup>2</sup> gu<sup>5</sup>ʔĩ<sup>4</sup>ma<sup>3</sup>...

ri<sup>1</sup> ɲe<sup>4</sup>ʔgu<sup>2</sup>ma<sup>4</sup> ti<sup>31</sup>ʔ -ĩ<sup>5</sup> na<sup>1</sup>- ɲu<sup>3</sup>ta<sup>4</sup>ke<sup>1</sup>ʔe<sup>3</sup> = ʔgu<sup>2</sup> i<sup>2</sup>  
 and and.then.NPST 3.I.PRO = IBEN 3.NonI.SBJ.SC.A be.in.group = SIMUL NCL:IV  
 gu<sup>5</sup>ʔĩ<sup>4</sup>ma<sup>3</sup>  
 all.IV

'When they are gathered together for one's benefit...' (Anderson 1962:316-317)  
 Less lit.: 'When one has them gathered together...'

c. Unergative verb, maleficiary

tʃo<sup>31</sup>ʔĩ<sup>5</sup> ni<sup>43</sup>do<sup>3</sup>ra<sup>3</sup>.

tʃo<sup>31</sup> = ʔĩ<sup>5</sup> ni<sup>43</sup> = do<sup>3</sup>ra<sup>3</sup>  
 1SG.PRO = IBEN 3.NonI.SBJ.MC.I- lie

'He lies, to my detriment.' (GE.LCS.20160620)  
 Less lit.: 'He lies to me.'

(137) Intransitive beneficiary case with quirky case verb ta<sup>5</sup>e<sup>3</sup> 'buy (purposive object)'

tʃo<sup>31</sup>ʔĩ<sup>5</sup> na<sup>43</sup>ʔpi<sup>3</sup>ka<sup>1</sup> na<sup>4</sup>ta<sup>5</sup>e<sup>3</sup>.

tʃo<sup>31</sup> = ʔĩ<sup>5</sup> na<sup>43</sup>- \*ʔpi<sup>3</sup> = ka<sup>1</sup> na<sup>4</sup> = ta<sup>5</sup>e<sup>3</sup>  
 1SG.PRO = IBEN DEF.POSS- \*bolt.of.cloth 3.NonI.SBJ.MC.A = buy/sell

'He bought the cloth for me.' (GE.JGR.20160624)

### 11.1.4 Purposive case

The purposive case is marked by =(?)ka<sup>1</sup>. It has the allomorph =ʔka<sup>1</sup> on monosyllabic bases and the allomorph =ka<sup>1</sup> on larger bases. The purposive has five distinct uses, excluding uses that obtain only with quirky case verbs.

In the first use of the purposive, it appears on the beneficiary or maleficiary of a transitive verb. This use is in complementary distribution with the intransitive beneficiary case. In the second use, which can be difficult to distinguish semantically from the first, it appears on a noun in a transitive or intransitive clause, conveying a meaning similar to the English expression 'because of NP.' (138) and (139) respectively provide examples of the transitive beneficiary use and the 'because of NP' use.

(138) Transitive beneficiary use of purposive

ri inanaʔigi ga guʔĩma ga Dekaporítjúanewa jeʔmagine ga iānegiwa niʔĩ na jaʔuʔĩ ga jema ɲetʃutʃu naka iʔĩ.

ri i= na= na= igi ga guʔĩma ga  
 and DIR = 3.NonI.SBJ.MC.A = 3.NonI.OBJ.MC.A = begin NCL:PST all.IV NCL:PST  
 Dekaporítjui \*ane -wa jeʔma -gine ga iāne -gi -wa ni  
 D \*place = ALL DLOC.ANA.PST -PL.II NCL:PST town -PL = ALL 3.NonI.PRO

-ʔĩ na ja = u ʔĩ ga jema ɲetʃutʃu  
 = ACC COMP 3.NonI.SBJ.SC.I = say -NMLZ:IV NCL:PST DNOM.ANA:IV Jesus  
 na -ka Ø = i ʔĩ  
 3.NonI.PRO = PURP 3.II.SBJ.SC.A = do -NMLZ:IV

'And he (a man cured by Jesus of demonic possession) began to tell, in all the towns of the Decapolis, what Jesus had done for him.' (Anderson & Anderson 2010, Mark 5:20)

(139) "Because of" use of purposive

"ta<sup>1</sup> wo<sup>3e1</sup>ta<sup>1</sup>ma<sup>3</sup> na<sup>31</sup>ka<sup>1</sup> ɲe<sup>2</sup>ɲma<sup>4</sup> tʃa<sup>3</sup>ri<sup>3</sup>ʔũ<sup>1</sup>," ja<sup>4</sup>na<sup>4</sup>ri<sup>3</sup>gi<sup>1</sup>.

ta<sup>1</sup> wo<sup>3e1</sup>ta<sup>1</sup>ma<sup>3</sup> na<sup>43</sup> = ka<sup>1</sup> ɲe<sup>2</sup>ɲma<sup>4</sup> tʃa<sup>3</sup>ri<sup>3</sup> = ʔũ<sup>1</sup> ja<sup>4</sup> =  
 also exactly 3.NonI.PRO = PURP DLOC.ANA? 1SG.MC.RI = stay QUOT =  
 na<sup>4</sup> = ri<sup>3</sup>gi<sup>1</sup>  
 3.NonI.SBJ.MC.A = QUOT

"It was for him exactly (i.e. to lie in wait for him and no one else) that I stayed there," she said.' (MFC, tik 2:24)

In the third use, which is doubtless related to the "because of" use, the purposive case can appear on a clause which has been subordinated with the subordinator -ʔĩ<sup>4</sup> (which also nominalizes the clause). The clause which bears the subordinator and the purposive case is then interpreted as a purpose clause (140). While clauses of this type are formally subordinate, the matrix clause can be ellipted, as it is in (140).

(140) Purposive case derives purpose clause from subordinate clause

ɲe<sup>4</sup>ɲgu<sup>2</sup>ma<sup>3</sup>ri<sup>5i1</sup>, me<sup>43</sup>ã<sup>2</sup> ta<sup>4</sup> na<sup>1</sup>ja<sup>31</sup>ʔĩ<sup>4</sup>ka<sup>1</sup>.

ɲe<sup>4</sup>ɲgu<sup>2</sup>ma<sup>3</sup> = ri<sup>5i1</sup> me<sup>43</sup>ã<sup>2</sup> ta<sup>4</sup> na<sup>1</sup> = ja<sup>43</sup> -ʔĩ<sup>4</sup> = ka<sup>1</sup>  
 so.NPST = like well FUT 3.NonI.SBJ.SC.A = be.adult -NMLZ:IV = PURP

'(One admonishes children) like that, so that they grow up well (i.e. to be good people).' (DGG, dbu 0:43)

The fourth use of the purposive case is spatial. In this use, the purposive appears on an NP in a clause with a motion verb. It encodes that (a) the path of the motion went from another point to the point where the purposive referent was located and (b) the figure (the entity in motion) underwent the motion in order to carry out an action involving that referent. With a human NP, this is typically interpreted as meaning that the figure went toward the purposive referent in order to see or talk to them (141a). The motion can be metaphorical (141b).

(141) Motion use of purposive

a. ku<sup>3</sup>ka<sup>1</sup> na<sup>4</sup>ʔĩ<sup>31</sup>

ku<sup>31</sup>- ka<sup>1</sup> na<sup>4</sup> = ʔĩ<sup>31</sup>  
 2.SG.PRO = PURP 3.NonI.SBJ.MC.A = come/go.PLACT  
 'They come to talk to you.' (SSG, iia 0:40)

b. na<sup>1</sup>ti<sup>4</sup>ri<sup>1</sup> we<sup>5</sup>na<sup>1</sup>, we<sup>5</sup>na<sup>1</sup> Tu<sup>3</sup>pa<sup>3</sup>na<sup>1</sup>ka<sup>1</sup> tʃa<sup>3</sup>ta<sup>5e1</sup>gu<sup>1</sup>.

na<sup>1</sup>ti<sup>4</sup>ri<sup>1</sup> we<sup>5</sup>na<sup>1</sup>, we<sup>5</sup>na<sup>1</sup> Tu<sup>3</sup>pa<sup>3</sup>na<sup>1</sup> = ka<sup>1</sup> tʃa<sup>3</sup> = ta<sup>5e1</sup>gu<sup>1</sup>  
 but again again Christian.God = PURP 1SG.SBJ.MC.A = return.SGACT  
 'But then I returned to God again (i.e. to being a Christian).' (ABS, avc 1:43)

The fifth use of the purposive case is to express reportive and inferential evidentiality. In this use, the purposive appears on an NP referring to a human. It expresses that the referent of the purposive NP has access to the proposition conveyed by the rest of the clause via inference or report. In spontaneous discourse, I have only ever heard or recorded this construction with the first person singular pronoun bearing the purposive (142). Speakers also find it acceptable in elicitation, though, with a second or third-person NP bearing the purposive (143). Note that in the third person use, the referent bearing the purposive is interpreted as the recipient of the report or the agent of the inference, *not* the source of the report. The purposive referent also cannot be assigned the "because of" reading, at least in (143b).

- (142) First person pronoun with purposive expresses reportive/inferential evidentiality with speaker as origo

a.  $ki^3?tʃi^3tu^1\tilde{a}^1ri^3 je^5e^3ra^1ki^5ra^1\tilde{i}^1 tʃau^1?ka^1, du^1\tilde{i}^3\tilde{r}i^4 gi^4 ri^1 na^4ta^4\tilde{a}^5\tilde{e}^3gi^4\tilde{r}i^5tʃi^1 po^2ra^4\tilde{a}^1ki^2ma^3.$   
 $ki^3?tʃi^3tu^1 \quad -\tilde{a}^1ri^3 \quad je^5e^3ra^1 = ki^5ra^1\tilde{i}^1 tʃau^1 \quad -?ka^1 \quad du^1\tilde{i}^3\tilde{r}i^4 = gi^4 ri^1$   
 Cushillococha -AL.POSS superior = INFER 1SG.PRO = PURP person.IV -PL TOP  
 $na^4 = \quad ta^4\tilde{a}^5\tilde{e}^3 = gi^4 \quad -\tilde{r}i^5tʃi^1 \quad po^2ra^4\tilde{a}^1ki^2ma^3$   
 3.NonI.SBJ.MC.A = be.happy -PLACT -INTENS INTENS

'It turns out, I think, that (people in Betania, Brazil) are really much happier than (people in) Cushillococha.' (ECG, bti 7:28)

- b.  $tʃau^1ka^1 ri^1 ni^4\tilde{d}a^1we^1$

$tʃau^1 = ka^1 \quad ri^1 \quad ni^4 = \quad \tilde{d}a^1we^1$   
 1SG.PRO = PURP TOP 3.NonI.SBJ.MC.I = be.sick

'He's sick, I heard/think.' (GE.DGG.20160725 based on OS 20160724)

- (143) Non-first-person argument with purposive expresses reportive/inferential evidentiality with purposive referent as origo

- a.  $ku^3?ka^1 ri^1 ja^1\tilde{d}a^1we^3?$

$ku^3 \quad -?ka^1 \quad ri^1 \quad ja^1 = \quad \tilde{d}a^1we^1$  -NTC  
 2.SG.PRO = PURP TOP 3.NonI.SBJ.SC.I = be.sick -SUB

'Do you think he's sick?' (GE.DGG.20160725)

- b.  $Ka^3ru^1ka^1 i^3ja^1\tilde{d}a^1we^1 i^4 \tilde{A}^3ma^3ri^3a^1.$

$Ka^3ru^1 = ka^1 \quad i^3ja^1 = \quad \tilde{d}a^1we^1 i^4 \quad \tilde{A}^3ma^3ri^3a^1$   
 K = PURP 3.NonI.SBJ.F.MC.I = be.sick -NCL:IV A

i. 'Amalia is sick, Carlos heard/thinks.'

ii. #'Amalia is sick because of Carlos (i.e. his actions).' (GE.DGG.20160725, sentence volunteered)

The semantic connection between the reportive/inferential use of the purposive and the other uses is distant, but there is no morphological evidence that this use represents a different morpheme from the purposive. A possible piece of evidence that the evidential use of the purposive and the other uses are syntactically different is that NPs with the reportive use of the purposive are very often topicalized with  $ri^1$  TOP. I do not have any examples of topicalization of a purposive phrase with any other use of the purposive.

There is an important interaction between definiteness and the purposive case, visible with quirky case verbs such as  $dau^2$  'look for (purposive object)' and  $ta^5e^3$  'buy (purposive object)'. It is impossible to assign the purposive case to a noun phrase if the existence of the referent of that noun phrase

is not presupposed. Instead, the purposive =*kq*<sup>1</sup> is replaced by a morphologically unrelated form =*ne*<sup>1</sup>. (144) illustrates one set of contexts that induce this alternation. (144b) presupposes the existence of the sweet potato, and has the purposive =*?kq*<sup>1</sup>; (144a) does not, and has =*ne*<sup>1</sup>.

(144) Alternation between =*kq*<sup>1</sup> and =*ne*<sup>1</sup> on object of *dau*<sup>2</sup> 'look for (purposive object)' (GE.LCS.20160721)

- a. Context: I am at the market and want to buy sweet potatoes, but do not know if there are any for sale today. I can say:

*ko*<sup>2</sup>*re*<sup>1</sup>, *ti*<sup>3</sup>*ne*<sup>1</sup> *tfa*<sup>3</sup>*dau*<sup>2</sup>.

*ko*<sup>2</sup>*re*<sup>1</sup>      *ti*<sup>3</sup> =*ne*<sup>1</sup>      *tfa*<sup>3</sup>=      *dau*<sup>2</sup>  
sweet.potato 3.I =PURP:INDEF 1SG.SBJ.MC.A = look.for

'I'm looking for a sweet potato.'

- b. Context: I am in my house. I know that I have a sweet potato, but don't know where it is. I can say:

*ko*<sup>2</sup>*re*<sup>1</sup>, *ti*<sup>31</sup>*ma*<sup>2</sup>*kq*<sup>1</sup> *tfa*<sup>3</sup>*dau*<sup>2</sup>.

*ko*<sup>2</sup>*re*<sup>1</sup>      *ti*<sup>31</sup>*ma*<sup>2</sup> =*kq*<sup>1</sup>      *tfa*<sup>3</sup>=      *dau*<sup>2</sup>  
sweet.potato 3.I      =PURP 1SG.SBJ.MC.A = look.for

'I'm looking for a/the sweet potato.'

Narrowly linguistic context can also produce the same alternation seen in (144). For example, take sentences of the form 'If there is X, I will buy it' -- that is, conditionals where (a) the antecedent clause is an existential, (b) the consequent clause has a purposive quirky case verb such as *ta*<sup>5</sup>*e*<sup>3</sup> 'buy,' and (c) the object in the consequent is coreferential with the pivot of the existential. In such a sentence, the content of the antecedent means that the existence of the object cannot be presupposed in the consequent clause. Therefore, =*ne*<sup>1</sup> rather than =*kq*<sup>1</sup> occurs in the consequent. Furthermore, at least in the examples of this construction that I have elicited, there is no overt pronoun in the consequent clause coreferential with the pivot in the antecedent. Instead, =*ne*<sup>1</sup> behaves as a second-position clitic, cliticizing to the first element of the consequent clause (145). (In this sentence, =*ne*<sup>1</sup> is tone 5 rather than tone 1. I suspect that the change in tone is related to the noun class of the object rather than to the clitic behavior.) This is very unusual, since in other cases an overt purposive pronoun is necessary to obtain the quirky case readings of quirky case verbs assigning the purposive.

(145) =*ne*<sup>1</sup> in the consequent clause of a conditional (GE.LWG.20160803)

*na*<sup>2</sup>*ji*<sup>31</sup>*ma*<sup>2</sup>*?gu*<sup>2</sup> *ja*<sup>2</sup> *ti*<sup>2</sup>*?e*<sup>1</sup> *ri*<sup>1</sup>, *ta*<sup>4</sup>*ne*<sup>5</sup> *tfa*<sup>3</sup>*ta*<sup>5</sup>*e*<sup>3</sup>.

*na*<sup>2</sup>=      *ji*<sup>31</sup>*ma*<sup>2</sup> -*?gu*<sup>2</sup> *ja*<sup>2</sup>      *ti*<sup>2</sup>*?e*<sup>1</sup>      *ri*<sup>1</sup>      *ta*<sup>4</sup> =*ne*<sup>5</sup>  
3.NonI.SBJ.SC.A = EXIST:III -COND NCL:III manioc TOP FUT =PURP:INDEF  
*tfa*<sup>3</sup>=      *ta*<sup>5</sup>*e*<sup>3</sup>  
1SG.SBJ.MC.A = buy/sell

'If there is manioc, I will buy it.'

The alternation between =*kq*<sup>1</sup> and =*ne*<sup>1</sup> is limited to grammatically inanimate NPs. =*ne*<sup>1</sup> is ungrammatical on animates. When a grammatically animate NP participates in this type of construction, the absence of an existence presupposition is encoded by using Class I agreement (§10.2), and the NP is still marked with the regular purposive =*kq*<sup>1</sup>.

### 11.1.5 Recipient case

The recipient case is marked by the element  $=(?na)^1$ . As with the purposive, this element has a glottal stop when it appears on a monosyllabic base, and does not when it appears on larger bases. Although the recipient case is involved in some quirky case phenomena, it has only two non-quirky uses: the recipient use and the source use.

In the recipient use, the recipient case marks the recipient in a clause with the verb root  $\tilde{a}^3$  'give (inanimate object)' or  $m\tilde{u}^2$  'give (animate)'. The theme in a clause with these verbs is marked with the accusative, modulo the animacy hierarchy. (146) exemplifies this use of the recipient case. There are no other verbs, *including* other verbs of transfer, which assign the recipient case to a notional recipient.

(146) Recipient case marks recipient with the verb  $\tilde{a}^3$  'give'

$tfo^3?na^1 na^4\tilde{a}^3?me^1$

$tfo^3 \quad -?na^1 na^4 = \quad \tilde{a}^3 \quad *?me^1$

1SG.PRO -RCP 3.NonI.SBJ.MC.A = give \*NI:hand

'He gave me his hand.' (GE.LCS.20170711 based on OS 20170710)

The source use of the recipient case encodes that the recipient-marked NP, which must refer to a point and not a region, is the origin of a path of motion. It typically obtains with motion verbs (147a) but is also possible with non-motion verbs (147b). The source use of the recipient case has an opaque use in the interjection  $ku^3?na^1!$ , which literally means 'away from you' but is used like the English interjection 'bye!'.

(147) Recipient case marks point source of motion with motion and non-motion verbs

a. Motion verb:  $\eta u^{31}e^3na^1 t\tilde{f}i^3\tilde{a}^1ga^1t\tilde{f}i^3$

$\eta u^{31}e^3 -na^1 t\tilde{f}i^3 = \quad \tilde{a}^1 -ga^1t\tilde{f}i^3$

canoe -RCP 1SG.SBJ.MC.I = row -DIR:short.path

'I'm rowing away from the canoe.' (context: speaker's canoe began to sink, so he got in another and went back to shore) (GE.LCS.20160621)

b. Non-motion verb:  $tfo^3?na^1 na^4ta^5e^3gi^4$

$tfo^3 \quad = ?na^1 na^4 = \quad ta^5e^3 \quad = gi^4$

1SG.PRO -RCP 3.NonI.SBJ.MC.A = buy/sell -PL

'They went off to shop (and left me here).' (context: answer to question 'Where are your companions?') (GE.LCS.20160621)

The recipient case could be described as a dative, since it marks the recipient thematic role assigned by the verbs most similar to the English verb 'give.' I refer to it as the 'recipient case' instead because the term 'dative' is often used to include other kinds of beneficiary and experiencer roles, which are not marked with this case in CT.

### 11.1.6 Comitative/instrumental case

The comitative/instrumental case is marked with  $=ma^4\tilde{a}^3$ . The comitative/instrumental case is involved in quirky case phenomena with a relatively small number of verbs. It has two non-quirky uses: as an instrumental, and as a comitative.

In the instrumental use, the comitative/instrumental case marks an instrument which the subject uses in the action of the verb. The instrumental NP can occupy an instrumental role in a literal (148a) or a metaphorical (148b) sense.

(148) Comitative/instrumental case marks instrument

a. Physical instrument

$mũ^3ka^3wa^1 ri^1 ta^3ra^5ma^4ʔã^3 na^41mq^1$ .

$mũ^3ka^3wa^1 ri^1 ta^3ra^5 = ma^4ʔã^3 na^41 = ma^1$   
 shotgun and machete = COM/INST 3.NonI.SBJ>3.NonI.OBJ.MC.I1 = kill

'He killed it with a shotgun and a machete (i.e. by shooting it and then finishing it off with a machete blow).' (GE.LCS.20160621)

b. Metaphorical 'instrument'

$ri^1 ʎe^3ʔ-, ʎe^3ma^2ã^1ki^2, me^31ʔã^4ma^4ʔã^3 ta^4na^3u^1ku^1ʔẽ^3$

$ri^1 ʎe^3ʔ- ʎe^3ma^2 = ã^1ki^2 me^43 -ʔã^4 = ma^4ʔã^3$   
 and HESIT DNOM.ANA:IV = ADVBZ be.good -NMLZ:IV = COM/INST  
 $ta^4 = na^3 = u^1ku^1ʔẽ^3$   
 1EXCL.SBJ.MC.A = 3.NonI.OBJ.MC.A = give.advice

'In that way we advise him with good (advice).' (DGG, ntk 2:01)

In the comitative use, the comitative marks an entity which accompanies the subject in the action of the verb (149).

(149) Comitative/instrumental case marks comitative role

$wi^43ʔi^4ka^4na^2 ga^4 wi^43ʔi^4 ga^4 ai^31ru^5, na^31mi^1ki^3 ga^4 ʎo^1wa^5ma^4ʔã^3, na^43gu^2 na^4ri^3ʔi^3ni^3e^3 ri^1$   
 $dau^4ʔʔi^2ta^3wa^5ma^3 ni^43ʔfo^43ku^2$ .

$wi^43ʔi^4 = ka^4na^2 ga^4 wi^43ʔi^4 ga^4 ai^31ru^5, na^31- *mi^1ki^3 ga^4 ʎo^1wa^5$   
 one = time NCL:PST one NCL:PST dog DEF.POSS- companion NCL Didelphis.sp  
 $= ma^4ʔã^3 na^43 = gu^2 na^4ri^3 = i^31ni^3 -e^3 ri^1 dau^4ʔʔi^2ta^3 = wa^5 -ma^2$   
 $= COM/INST 3.PRO = LOC 3.NonI.SBJ.MC.RI = 'hear' -PLACT and high.forest = ALL -TOP$   
 $ni^43 = ʔfo^43ku^2$   
 3.NonI.SBJ.MC.I = enter.PLACT

'One time a dog, with his friend, an opossum, had an idea and went into the forest.' (DGG, ngo 0:16)

In the comitative use only, the comitative/instrumental case displays an interesting interaction with verbal number. Leaving aside subject proclitics, number is marked on the CT verb in four ways: (a) for all verbs, with number affixes, such as the plural/pluractional markers  $=gi^4$  and  $-e^3$  and the distributive  $-ʔʔi^1gi^1$ ; (b) for stative verbs, by changing the inflection class of the stem; (c) for a subset of stems with directionals, by suppletting the directional; and (d) for a subset of verb roots (most of them motion verbs) by suppletting the root. (c) and (d), the root and directional suppletion phenomena, occur if and only if the internal argument of the verb is plural. They are judged ungrammatical if the internal argument is singular, even if the action occurs multiple times and/or an external argument is plural.

With this in mind, observe in (149) that the nominative argument of the verb,  $wi^43ʔi^4 ga^4 ai^31ru^5$  'a dog,' is singular, but the verb stem  $ʔfo^43ku^2$  appears in its suppletive plural allomorph. That

is, in an intransitive sentence that has a formally singular subject but also has a comitative NP modifying the subject, the verb can undergo root suppletion as though the subject were plural. (150a) provides an additional elicited example of this with the first person plural. It also remains possible for the verb in such a sentence to appear in the allomorph for singular subjects (150b).

(150) Interactions of comitative NPs with verbal number suppletion (GE.LCS.20160621)

- a. 1SG nominative argument, comitative NP, verb marked for singular internal argument

*tʃo<sup>1</sup>ma<sup>2</sup> ni<sup>41</sup>ʔi<sup>4</sup> na<sup>43</sup>ma<sup>4</sup>ʔã<sup>3</sup> nã<sup>31</sup>ne<sup>3</sup>ki<sup>3</sup>wa<sup>5</sup> tʃi<sup>3</sup>ʔi<sup>43</sup>ku<sup>2</sup>*

*tʃo<sup>1</sup>ma<sup>2</sup> ni<sup>41</sup>ʔi<sup>4</sup> na<sup>43</sup> = ma<sup>4</sup>ʔã<sup>3</sup> nã<sup>31</sup> \*ne<sup>3</sup>ki<sup>3</sup> = wa<sup>5</sup> tʃi<sup>3</sup> =*

1SG.PRO PRED.FOC 3.PRO = COM/INST tree \*stand.of.plants = ALL 1SG.SBJ.MC.I =  
i<sup>43</sup>ku<sup>2</sup>

enter.SGACT

'I go into the forest with him.'

- b. 1SG nominative argument, comitative NP, verb marked for plural internal argument

*tʃo<sup>1</sup>ma<sup>2</sup> ni<sup>41</sup>ʔi<sup>4</sup> na<sup>43</sup>ma<sup>4</sup>ʔã<sup>3</sup> nã<sup>31</sup>ne<sup>3</sup>ki<sup>3</sup>wa<sup>5</sup> ti<sup>4</sup>tʃo<sup>43</sup>ku<sup>2</sup>*

*tʃo<sup>1</sup>ma<sup>2</sup> ni<sup>41</sup>ʔi<sup>4</sup> na<sup>43</sup> = ma<sup>4</sup>ʔã<sup>3</sup> nã<sup>31</sup> \*ne<sup>3</sup>ki<sup>3</sup> = wa<sup>5</sup> ti<sup>4</sup> =*

1SG.PRO PRED.FOC 3.PRO = COM/INST tree \*stand.of.plants = ALL 1SG.SBJ.MC.I =  
tʃo<sup>43</sup>ku<sup>2</sup>

enter.PLACT

'I go into the forest with him.' (More lit.: 'I with him, we go into the forest.')

Quirky case uses of the comitative/instrumental are more token-frequent in my corpus than either instrumental or comitative uses of this case. One extremely common 'quirky' use of the comitative is with the verb root *ã<sup>3</sup>* 'have, come to have (inalienable noun).' This verb root is used only with inalienable nouns and obligatorily incorporates its 'object,' which plays the semantic role of possessum. If the possessum is also expressed by a coreferential NP elsewhere in the sentence, that NP must be marked with the comitative, as in (151).

(151) Use of the comitative with *ã<sup>3</sup>* 'have inalienable possessum'

*ri<sup>1</sup> je<sup>4</sup>ʔgu<sup>2</sup>ma<sup>4</sup>, tʃo<sup>31</sup>ri<sup>3</sup> ma<sup>3</sup>ma<sup>5</sup>ma<sup>4</sup>ʔã<sup>3</sup> nu<sup>5</sup>a<sup>2</sup>ma<sup>3</sup> na<sup>4</sup>ʔã<sup>3</sup>ʔma<sup>1</sup>.*

*ri<sup>1</sup> je<sup>4</sup>ʔgu<sup>2</sup>ma<sup>4</sup> tʃo<sup>31</sup>ri<sup>3</sup> ma<sup>3</sup>ma<sup>5</sup> = ma<sup>4</sup>ʔã<sup>3</sup> nu<sup>5</sup>a<sup>2</sup> = ma<sup>3</sup> na<sup>4</sup> =*

and then.PST 1SG.AL.POSS mother = COM/INST DLOC:here = INFO 3.NonI.SBJ.MC.A =  
*ã<sup>3</sup> \*ʔma<sup>1</sup>*

have \*NI:wife

'Then he (my father) married my mother (lit. got her as a wife) here.' (HCG, hbu 0:41)

### 11.1.7 Locative case

The locative case is marked by =*gu<sup>2</sup>*. This item is in a minimal pair with =*ʔgu<sup>2</sup>*, which appears on verb stems and forms the antecedent of a conditional or the subordinate clause in a temporal overlap clause-linking construction. The locative causes some unusual morphological processes on following verbs. Since it shares most of these properties with the allative, I discuss them in §11.1.8.

The locative case marks a wide variety of spatial and grammatical relations and participates extensively in quirky case constructions. Perhaps its most prototypical use is the static location use.

In this use, the locative marks static locations with most intransitive and transitive non-motion verbs. (There are some important verb roots, such as the existential verb, which instead assign the allative for static location: §11.1.8.) (152) provides examples of the static location use of the locative with several types of verb roots.

(152) Locative case marks static location with intransitive, transitive, and non-motion verbs

a. Positional intransitive verb

*na<sup>43</sup>ma<sup>1</sup>gu<sup>2</sup> tfa<sup>3</sup>tʃi<sup>4</sup>.*

*na<sup>43</sup>- \*ma<sup>1</sup> = gu<sup>2</sup> tʃa<sup>3</sup> = tʃi<sup>4</sup>*

DEF.POSS- \*path = LOC 1SG.SBJ.MC.A = be.standing

'I am standing in the path.' (GE.LCS.20160621)

b. Non-positional intransitive verb

*ŋe<sup>2</sup>ʔma<sup>4</sup>ta<sup>1</sup>a<sup>3</sup> na<sup>4</sup>bu<sup>31</sup>e<sup>3</sup> Ki<sup>3</sup>ʔtʃi<sup>3</sup>tu<sup>1</sup>gu<sup>2</sup>.*

*ŋe<sup>2</sup>ʔma<sup>4</sup> = ta<sup>1</sup>a<sup>3</sup> na<sup>4</sup> = bu<sup>31</sup> -e<sup>3</sup> Ki<sup>3</sup>ʔtʃi<sup>3</sup>tu<sup>1</sup> = gu<sup>2</sup>*

DLOC.ANA? = INFO 3.NonI.SBJ.MC.A = be.child -PL Cushillococha = LOC

'They were born right there in Cushillococha.' (DGG, aki 1:49)

c. Transitive verb

*dau<sup>4</sup>ʔtʃi<sup>2</sup>ta<sup>3</sup>a<sup>1</sup>ne<sup>1</sup>gu<sup>2</sup> di<sup>1</sup>e<sup>3</sup>ni<sup>1</sup> tfa<sup>3</sup>ʔi<sup>2</sup>. (\*dau<sup>3</sup>tʃi<sup>2</sup>ta<sup>4</sup>a<sup>1</sup>ne<sup>1</sup>wa<sup>5</sup>)*

*dau<sup>4</sup>ʔtʃi<sup>2</sup>ta<sup>3</sup> \*a<sup>1</sup>ne<sup>1</sup> = gu<sup>2</sup> di<sup>1</sup>e<sup>3</sup>ni<sup>1</sup> tʃa<sup>3</sup> = i<sup>2</sup>*

high.forest \*land = LOC palm.leaf.shelter 1SG.SBJ.MC.A = make

'I made a temporary shelter in the forest.' (GE.LCS.20160628)

With motion verbs, the locative can mark either the ground or the means of motion. The ground of motion marked with the locative can be a region which contains the path of motion (153a) or a feature of the landscape which establishes the path of motion (153b). I do not have examples of whether the locative can be used to talk about points which the path of motion goes around, goes through, or passes. It can be used for the means of motion, as in (153c).

(153) Locative case marks ground and means of motion with motion verbs

a. Locative NP is region containing entire path of motion

*na<sup>43</sup>ta<sup>4</sup>a<sup>3</sup>gu<sup>2</sup> tʃi<sup>3</sup>we<sup>4</sup>ʔe<sup>2</sup>*

*na<sup>43</sup>- \*ta<sup>4</sup>a<sup>3</sup> = gu<sup>2</sup> tʃi<sup>3</sup> = we<sup>4</sup>ʔe<sup>2</sup>*

DEF.POSS- \*lake = LOC 3.NonI.SBJ.MC.I = swim

'I am swimming in the lake.' (GE.LCS.20160621)

b. Locative NP is feature of the landscape establishing path of motion

*na<sup>43</sup>ʔti<sup>4</sup>ʔa<sup>3</sup>ki<sup>1</sup>gu<sup>2</sup> tʃi<sup>3</sup>ʔũ<sup>43</sup>*

*na<sup>43</sup>- \*ʔti<sup>4</sup> -ʔa<sup>3</sup>ki<sup>1</sup> = gu<sup>2</sup> tʃi<sup>3</sup> = ũ<sup>43</sup>*

DEF.POSS- \*river -DIM = LOC 3.NonI.SBJ.MC.I = come/go.SGACT

'I (arrived by) walking along (the course of) the stream.' (GE.LCS.20160621)

c. Locative NP is means of motion

*ri<sup>1</sup> bo<sup>3</sup>te<sup>1</sup>gu<sup>2</sup> ti<sup>4</sup>ʔi<sup>43</sup>*

*ri<sup>1</sup> bo<sup>3</sup>te<sup>1</sup> = gu<sup>2</sup> ti<sup>4</sup>- i<sup>43</sup>*

and motorized.boat = LOC 1EXCL.SBJ.MC.I- come/go.PLACT

'We went in a boat.' (LCS, ldt 0:46)

Anderson (1962) provides a large number of examples of NPs marked with the locative participle in the verbless locative construction (154). My consultants accept the Anderson examples and make comments indicating that they are appropriate as answers to 'where' questions, i.e. that they convey location focus. I have also recorded one example of the verbless locative construction in a text. In general, though, my consultants do not use this structure, including in location focus contexts. Instead, they use constructions with the existential verb and an allative NP.

(154) Verbless locative construction :  $tfa^3ti^3re^1gu^2$

$tfa^3 =$                        $ti^3re^1 = gu^2$   
1SG.SBJ.MC.A = port = LOC

'I am in the port.' (Anderson 1962: 355)

The locative is also used to license a wide variety of adjunct NPs with no apparent spatial meaning. For example, the locative appears on NPs denoting time periods; prices; topics of speech, conversation, and thought; sources of information (e.g. 'according to the story'); and materials (with manufacturing verbs).

### 11.1.8 Allative case

The allative case is marked by  $=wa^5$ . This case participates in some quirky case phenomena, but its core uses are spatial. In this section, I begin by discussing the use of the allative with motion verbs and to express static location (in which use it alternates with the locative). I then explore the unique morphophonological properties shared by the allative and locative.

This case is semantically much broader than most cases described as allative. 'Allative/ablative' would be a more appropriate name for the case, but I refer to it as 'allative' for brevity.

**Allative with motion verbs** With a motion verb, the allative can mark either the goal (155a,b) or the source (155c) of motion. In the source use, the ablative is optionally followed by the dedicated ablative enclitic  $=ne^5$  (155d). Except on locative deictics (below),  $=ne^5$  can only appear on a word that is already marked with the allative. Therefore, I do not analyze it as an independent case. It could be seen as a postposition that assigns the allative case, but if so it is the language's only postposition.

Goal NPs marked with the allative can refer to a region (155a) or a point (155b). Source NPs marked with the case typically refer to regions (155c,d), since the motion dative is used to mark the source when it is a point.

(155) Ablative/allative case marks goal and source of motion with motion verbs

a. Goal is region

$dau^4?tʃi^2ta^3wa^5 na^2ʔi^3ʔi^4 ri^1...$

$dau^4?tʃi^2ta^3 = wa^5 na^2 =$                        $i^3i^1$                        $-ʔi^4$                        $ri^1$   
high.forest = ALL 3.NonI.SBJ.SC.A = come/go.PLACT -NMLZ:IV and

'So they went to the high forest, and...' (MFC, 0:39)

b. Goal is point

$ri^1 nu^5a^2 i^3i^1pa^4ta^3wa^5 ta^3na^3na^4$

ri<sup>1</sup> nu<sup>5</sup>a<sup>2</sup> i<sup>31</sup> \*pa<sup>4</sup>ta<sup>3</sup> = wa<sup>5</sup> ta<sup>3</sup> = na<sup>3</sup> = na<sup>4</sup>  
 and DLOC:here house \*house = ALL 3.I.MC.A = 3.NonI.OBJ.MC.A = put.INAM.PLACT  
 'One brings them to the house.' (LCS, nai 0:35)

c. Source without = ne<sup>5</sup>

i<sup>31</sup>pa<sup>4</sup>ta<sup>3</sup>wa<sup>5</sup> i<sup>5</sup>na<sup>4</sup>?i<sup>31</sup>?i<sup>1</sup>

i<sup>31</sup> \*pa<sup>4</sup>ta<sup>3</sup> = wa<sup>5</sup> i<sup>5</sup> = na<sup>4</sup> = i<sup>43</sup> -?i<sup>1</sup>  
 house \*house = ALL DIR = 3.NonI.SBJ.MC.A = come/go.SGACT -DIR:outwards  
 'He leaves the house.' (GE.LCS.20160630)

d. Source with = ne<sup>5</sup>

...nu<sup>5</sup>a<sup>2</sup>ta<sup>1</sup>?a<sup>3</sup> Peru-wa<sup>5</sup>ne<sup>5</sup> na<sup>4</sup>na<sup>3</sup>ga<sup>4</sup>gi<sup>4</sup> ri<sup>1</sup>.

nu<sup>5</sup>a<sup>2</sup> = ta<sup>1</sup>?a<sup>3</sup> Peru = wa<sup>5</sup> = ne<sup>5</sup> na<sup>4</sup> = na<sup>3</sup> =  
 DLOC:here = INFO P = ALL -SOURCE 3.NonI.SBJ.MC.A = 3.NonI.OBJ.MC.A =  
 ga<sup>4</sup> = gi<sup>4</sup> ri<sup>1</sup>  
 bring/take.ANIM and

'He (SIL missionary Lambert Anderson) brought people from right here in Peru, too.'  
 (how Cushillococha came to be so large; ECG, ebu 7:05)

In all of the examples in (155), the allative NP denotes either a location or, in the case of *i<sup>31</sup>pa<sup>4</sup>ta<sup>3</sup>* 'house,' an entity that can be conceived of as either an individual or a location. It is also possible, though, to use the allative on NPs that prototypically denote individuals or events.

First, the goal of motion may be expressed by an allative NP denoting an individual, as in (156). This construction, which is available only with motion verbs, has two possible readings. One, which is possible with all kinds of allative NPs, is that the figure in motion undergoes the motion in order to get the allative NP referent and bring it back to the source of motion. This reading is similar to the meanings of the English expressions 'go for' and 'go get.' It is the only reading of (156a) and the more prominent reading in (156b). The other possible reading of this construction obtains only with occupation terms such as *du<sup>3</sup>tu<sup>3</sup>ru<sup>1</sup>* 'doctor/nurse' and *tfu<sup>3</sup>ra<sup>3</sup>ra<sup>1</sup>* 'soldier.' It means that the subject is in the process of entering the occupation described by the allative NP (156b.ii).

(156) Motion verb with allative NP denoting individual

a. *ju<sup>3</sup>ra<sup>1</sup>wa<sup>5</sup>na<sup>4</sup>?i<sup>43</sup>*

ju<sup>3</sup>ra<sup>1</sup> = wa<sup>5</sup> na<sup>4</sup> = i<sup>43</sup>  
 palm.sp = ALL 3.NonI.SBJ.MC.A = come/go.SGACT

'He went to get *Iriartea deltoidea* (palm used in house construction) (and bring it back to use).' ('go get' reading) (GE.LCS.20160621)

b. *du<sup>3</sup>tu<sup>3</sup>ru<sup>1</sup>wa<sup>5</sup>tfa<sup>3</sup>?i<sup>43</sup>*

du<sup>3</sup>tu<sup>3</sup>ru<sup>1</sup> = wa<sup>5</sup> tfa<sup>3</sup> = i<sup>43</sup>  
 doctor/nurse = ALL 1SG.SBJ.MC.A = come/go.SGACT

- i. 'I'm going to get a doctor (and bring him/her back to attend a sick person).' ('go get' reading)
- ii. 'I'm becoming a doctor.' (reading restricted to occupation terms) (GE.MFC.20160623, discussion of mbu 2:07)

Note that the 'go get' reading in (156) does *not* involve construing the NP denoting the individual as referring to a region which is defined by the individual's (habitual or actual) presence. That is,

(156b) cannot mean 'He is going to the doctor' or 'He is going to where the doctors are.' Consultants emphatically reject uses of the individual allative construction to translate these meanings. They can only be expressed by using a possessed form of the inalienable noun *\*ĩ<sup>1</sup>ta<sup>1</sup>* 'space around possessor's body; space where possessor habitually is' marked with the allative case, as in (157).

(157) Motion verb with allative NP headed by *\*ĩ<sup>1</sup>ta<sup>1</sup>* 'body/habitual space'

a. 'Habitual space' sense

*tfo<sup>31</sup>ri<sup>3</sup> ma<sup>3</sup>ma<sup>5</sup>ĩ<sup>1</sup>ta<sup>1</sup>wa<sup>5</sup> tfa<sup>3</sup>ta<sup>5</sup>e<sup>1</sup>gu<sup>1</sup>*

*tfo<sup>31</sup>ri<sup>3</sup> ma<sup>3</sup>ma<sup>5</sup> \*ĩ<sup>1</sup>ta<sup>1</sup> = wa<sup>5</sup> tfa<sup>3</sup> = ta<sup>5</sup>e<sup>1</sup>gu<sup>1</sup>*

1SG.AL.POSS mother \*habitual.space = ALL 1SG.SBJ.MC.A = return.SGACT

'I'm returning from my mother's house.' (GE.LCS.20160621)

b. 'Body space' sense

*ri<sup>1</sup> di<sup>4</sup>ŋwa<sup>5</sup> ŋi<sup>31</sup>ĩ<sup>1</sup>ta<sup>1</sup>wa<sup>5</sup> tfa<sup>3</sup>ri<sup>3</sup>to<sup>1</sup>.*

*ri<sup>1</sup> di<sup>4</sup>ŋwa<sup>5</sup> ŋi<sup>31</sup>- \*ĩ<sup>1</sup>ta<sup>1</sup> = wa<sup>5</sup> tfa<sup>3</sup>ri<sup>3</sup> = to<sup>1</sup>*

and at.last 3.F.POSS- \*body.space = ALL 1SG.SBJ.MC.RF = sit.down

'And finally, I sat down next to her.' (DGG, luz 3:27)

The contrast between the 'go get' use of the allative, the use of *\*ĩ<sup>1</sup>ta<sup>1</sup>* with the allative, and the motion use of the purposive is difficult to express in English, in which 'to NP' and 'for NP' can each potentially convey at least two of these meanings. Therefore, I represent the contrasts graphically in (158). In this diagram, X is the figure in motion and Y is the referent of the adjunct NP (for the motion purposive and 'go get' allative) or the possessor of the adjunct (for the allative with *\*ĩ<sup>1</sup>ta<sup>1</sup>*).

(158) Graphical representation of contrasts between constructions expressing motion toward an individual

'Go get' allative

X goes to point defined by Y's presence



X returns to the origo with Y

*\*ĩ<sup>1</sup>ta<sup>1</sup>* + allative

X goes to region defined by Y's presence (habitual or actual)



Motion purposive

X goes to point defined by Y's presence



X and Y interact at the point

Second, the goal or source of motion can also be expressed by an allative NP denoting an event, as in (159). This construction is also available only with motion verbs. It encodes that the figure

in motion undergoes the motion in order to begin or stop participating in the event (with an NP denoting an event) or in order to enter or exit a state (with an NP denoting a state). In my corpus, the NP denoting the state or event in this construction is always a zero-nominalized verb stem. Most examples of this construction involve literal motion, but there are also fictive motion uses, such as (159c).

(159) Motion verb with allative NP denoting event

a. Event is goal

$na^{43}gu^2 na^4ri^3\tilde{r}i^3na^2, ga^4 to^1 ga^4 \eta u^1wa^5 tjo^{31}\tilde{r}i^3 na^2-, na^2ga^1\tilde{r}i^4.$

$na^{43} = gu^2 na^4ri^3 = \tilde{r}i^3na^2 ga^4 to^1 ga^4 \eta u^1 -\emptyset$

3.PRO = LOC 3.NonI.SBJ.MC.RI = think NCL:PST other NCL:PST learn -NMLZ:event

=  $wa^5 tjo^{31} = \tilde{r}i^3 na^2 = na^2 = ga^4 -\tilde{r}i^4$

= ALL 1SG.PRO = ACC 3.NonI.SBJ.SC.A = 3.NonI.SBJ.SC.A = bring/take.ANIM -SUB

'He thought about sending me to another (course of) study.' (DGG, puc 1:12)

b. Event is source

$na^4\eta \eta e^3ma^2\tilde{a}^1ki^2 te^1e^5gi^4 ga^4 ji^4e^2ma^3, ma^3ri^3 \eta e^3ma^2 dai^2wa^5ne^5 \tilde{r}i^3\tilde{r}e^3...$

$na^4\eta \eta e^3ma^2 -\tilde{a}^1ki^2 te^1e^5 = gi^4 ga^4 ji^4e^2ma^3 ma^3ri^3 \eta e^3ma^2$

COMP DNOM.ANA:IV -ADVZ who? -PL NCL:PST DNOM.ANA.I now DNOM.ANA.IV

$dai^2 -\emptyset = wa^5 = ne^5 \emptyset = \tilde{r}i^3 -\tilde{e}^3$

hit.PLACT -NMLZ:event = ALL -SOURCE 3.I.SBJ.SC.A = come/go.PLACT -NMLZ:I

'(They gave medals) like that to anyone who had come from the conflict...' (SSG, tsr 2:12)

c. State is goal; metaphorical

$kwq^1wa^5 na^4\eta u^3gi^4$

$kwq^1 -\emptyset = wa^5 na^4 = \eta u^3 = gi^4$

know -NMLZ:state = ALL 3.NonI.SBJ.MC.A = arrive -PL

'They became educated.' (Lit.: 'They arrived at knowledge.') (DGG, aki 2:17)

**Allative expressing static location** Like the locative, the allative has many idiosyncratic non-spatial uses. In some of these, it is the only possible case which can license a particular kind of adjunct. For example, with speech predicates, only the allative can license an NP referring to the language of speech. In other uses, both the allative and the locative are possible. Prices and time periods, for example, can be either locative or allative.

There is a much more significant area of overlap between the locative and the allative in the semantic domain of static location. For a subset of verb stems, it is the *allative* -- not the locative -- which is used to license an adjunct expressing static location. The existential verb is the most important verb stem in this category. With the existential, place can only be expressed with the allative. The locative is ungrammatical (160). The same facts obtain for the negative existential.

(160) Only allative acceptable for location with existential (GE.LCS.20160621)

a.  $dau^4\eta tji^2ta^3wa^5 ni^4\tilde{r}i^4 na^1\eta e^3ma^2\tilde{r}i^4$

$dau^4\eta tji^2ta^3 = wa^5 ni^4\tilde{r}i^4 na^2 = \eta e^3ma^2 -\tilde{r}i^4$

high.forest = ALL PRED.FOC 3.NonI.SBJ.SC.A = EXIST.IV -SUB

'It is *in the forest*.'

- b. \**dau<sup>4</sup>ʔfi<sup>2</sup>ta<sup>3</sup>gu<sup>2</sup> ni<sup>41</sup>ʔi<sup>4</sup> na<sup>2</sup>ŋe<sup>3</sup>ma<sup>2</sup>ʔi<sup>4</sup>*  
 Attempted reading: (It is in the forest.)

A given verb stem always takes the same case for static location -- locative or allative -- regardless of the identity of the participants in the predicate. Some non-existential predicates which obligatorily take the allative for static locations include *i<sup>4</sup>* 'be standing, speaking of a tree' (cf. *tʃi<sup>4</sup>* 'be standing, speaking of an animate' and *wɑ<sup>1</sup>* 'perch' with obligatory locative); *tu<sup>1</sup>ʔu<sup>3</sup>* 'fell tree'; *ma<sup>3</sup>* 'split (e.g. firewood)'; *mu<sup>3</sup>* 'weave' (cf. *i<sup>2</sup>* 'make' with obligatory locative); and *pu<sup>3</sup>ra<sup>3</sup>ki<sup>4</sup>* 'work.' The figure-ground relation between the participants in the predicate and the location does not appear to be relevant to the alternation. Neither is the animacy of the participants, the inflectional class of the verb, or the lexical aspect of the verb. The only generalization apparent to me is that non-positional stative verbs tend to take the allative for static location, but this is far from exceptionless. For example, while the existential takes the allative, the attributive verb *ã<sup>3</sup>* 'have' -- which participates in some constructions that are semantically very similar to existentials -- takes the locative.

Because of the locative-allative alternation for static locations, the semantic contrast between locative and allative can only be defined for clauses containing motion verbs. In a clause with a motion verb, the allative must express the goal or source of the path of motion, and the locative must express the ground or means of motion.

**Morphological properties of the allative and locative** Like all case markers in CT, the allative and locative induce forward-looking allomorphy on pronominal bases (§11.2). Unlike all other case markers, however, they also induce backward-looking allomorphy on an immediately following verb. When the allative or locative immediately precedes a verb which has certain pre-proclitics, the pre-proclitic obligatorily deletes. There are four syntactically distinct pre-proclitics in the language: *i<sup>2</sup>=*, which is part of the exponence of some directional constructions and an arbitrary part of the exponence of some non-directional verbs; *i<sup>5</sup>=*, which is part of the exponence of other directional constructions, and is also an arbitrary part of the exponence of some verbs; the homophonous *i<sup>5</sup>=*, which marks imperfective aspect; and *i<sup>5</sup>=*, which is the third person object proclitic for verbs which have associated motion proclitics.

Following the allative and locative, pre-proclitics which either (a) expone the imperfective or (b) are an arbitrary part of the verb's exponence delete. For example, consider the verb *to<sup>43</sup>* 'plant.SGACT.' This verb has the pre-proclitic *i<sup>2</sup>=* as an arbitrary part of its exponence. The first person form of the verb in isolation is therefore *i<sup>2</sup>=tʃa<sup>3</sup>=na<sup>3</sup>=to<sup>43</sup>* (DIR = 1SG.MC.A = 3.NonI.OBJ.MC.A = plant) 'I plant it.' When the verb follows the allative or locative, however, the *i<sup>2</sup>=* pre-proclitic obligatorily deletes, as in (161). The same facts obtain with the verb *ŋu<sup>3</sup>* 'arrive.' This verb has the pre-proclitic *i<sup>5</sup>=* as part of its exponence, with the citation form *i<sup>5</sup>=tʃa<sup>3</sup>=ŋu<sup>3</sup>* (DIR = 1SG.MC.A = arrive) 'I arrived/am arriving.' When the verb immediately follows the allative or locative, this pre-proclitic also deletes (162).

(161) Frozen *i<sup>2</sup>=* pre-proclitic deletes following locative and allative

*du<sup>1</sup>ʔi<sup>3</sup>ʔi<sup>4</sup> gi<sup>4</sup> ri<sup>1</sup> na<sup>4</sup>ʔã<sup>1</sup>ti<sup>3</sup>gu<sup>2</sup> na<sup>4</sup>na<sup>3</sup>to<sup>43</sup>* (\**i<sup>2</sup>na<sup>4</sup>na<sup>3</sup>to<sup>43</sup>*)

*du<sup>1</sup>ʔi<sup>3</sup>ʔi<sup>4</sup>* = *gi<sup>4</sup> ri<sup>1</sup> na<sup>4</sup>*- \**ʔã<sup>1</sup>ti<sup>3</sup>* = *gu<sup>2</sup> na<sup>4</sup>* = *na<sup>3</sup>* =  
 person.IV = PL TOP 3.III/IV- \*yard = LOC 3.NonI.SBJ.MC.A = 3.NonI.OBJ.MC.A =

to<sup>43</sup>  
plant.SGACT

'People also plant it (*Mauritia flexuosa*) in their yards.' (LCS, tem 0:52)

(162) Frozen *i*<sup>5</sup>= pre-proclitic deletes following locative and allative

*ri*<sup>1</sup> *Di*<sup>3</sup>*ti*<sup>3</sup>*tʃi*<sup>4</sup>*a*<sup>2</sup>*wa*<sup>5</sup> *tʃa*<sup>3</sup>*ŋu*<sup>3</sup> (\**i*<sup>5</sup>*tʃa*<sup>3</sup>*ŋu*<sup>3</sup>)

*ri*<sup>1</sup> *Di*<sup>3</sup>*ti*<sup>3</sup>*tʃi*<sup>4</sup>*a*<sup>2</sup> = *wa*<sup>5</sup> *tʃa*<sup>3</sup> =            *ŋu*<sup>3</sup>  
and Leticia            = ALL 1SG.MC.A = arrive

'And I arrived in Leticia.' (DGG, dit 0:26)

The same deletion as in (161) and (162) occurs with the imperfective pre-proclitic. Crucially, it does not occur with verbs where the pre-proclitic expones one of CT's 19 productive directional constructions. As an example, take the Outwards directional construction. This construction occurs on motion verbs and indicates that the path of motion begins in an enclosed space and ends outside the enclosed space. It has three distinct exponents: (a) the verb complex bears the pre-proclitic *i*<sup>5</sup>=, (b) the verb's inflection class is changed from its underlying class to the *a*-class, and (c) the verb stem bears the suffix *-ʔi*<sup>2</sup>*tʃi*<sup>4</sup> (if the internal argument is singular) or *-i*<sup>1</sup> (if the internal argument is plural or the verb is the maximally bleached motion verb *ũ*<sup>43</sup> 'come/go/walk.SGACT'). Although verbs which are derived with the Outwards directional have an *i*<sup>5</sup>= pre-proclitic, the pre-proclitic does not delete following the allative or locative (163, repeated from 155c).

(163) Directional *i*<sup>5</sup>= pre-proclitic does not delete following locative and allative

*ĩ*<sup>31</sup>*pa*<sup>4</sup>*ta*<sup>3</sup>*wa*<sup>5</sup> *i*<sup>5</sup>*na*<sup>4</sup>*ʔũ*<sup>31</sup>*ʔĩ*<sup>1</sup>

*ĩ*<sup>31</sup>        \**pa*<sup>4</sup>*ta*<sup>3</sup> = *wa*<sup>5</sup> *i*<sup>5</sup> =        *na*<sup>4</sup> =                            *ũ*<sup>43</sup>                            *-ʔĩ*<sup>1</sup>  
house \*house = ALL DIR = 3.NonI.SBJ.MC.A = come/go.SGACT -DIR:outwards

'He leaves the house.' (GE.LCS.20160630)

The allative and locative also do not delete the *i*<sup>5</sup>= third person object pre-proclitic. Furthermore, the allative and locative fail to delete any of the pre-proclitics if a free word, such as an adverb, intervenes between the allative/locative and the verb with the potentially deletable pre-proclitic. They *do* delete following pre-proclitics, on the other hand, if an information-structural clitic like =*ma*<sup>3</sup> intervenes between the allative and the verb.

**Shared morphological properties of allative NPs and locative deictics** I claimed in §7 that locative deictics in CT are morphologically nouns. In this section, I show that the locative deictics specifically share the morphosyntactic behavior of referential NPs marked with the allative case. Some spatial nouns which have both deictic and non-deictic uses, such as *dau*<sup>5</sup>*ʔke*<sup>2</sup> 'upriver,' may also share these properties (Anderson 1962:359). I will focus, however, on the four locative deictics shown in Table 12.

As a preliminary to the discussion below, observe that three of the four locative deictics in Table 12 are segmentally identical to the Class IV nominal deictics. The locative deictics, however, all have the tone melody 5.2, while the Class IV nominal demonstratives have other tone patterns. As a result, the distal locative deictic is in a minimal tone pair with the Class IV distal demonstrative, the general nonpast locative deictic with the Class IV general nonpast demonstrative, and the general past locative deictic with the Class IV general past demonstrative. The two general locative

Table 12: Locative deictics

Series	Form	Semantic Comment
Proximal	nu <sup>5</sup> a <sup>2</sup>	
Distal	je <sup>5</sup> a <sup>2</sup>	Refers to a specific place
Nonpast General	ŋe <sup>5</sup> ma <sup>2</sup> , ŋe <sup>2</sup> ŋma <sup>4</sup> (verbless locative)	In nonpast clauses. Anaphoric and 'throwaway' (refers to place the location of which is unknown or irrelevant; Hanks 1990:420)
Past General	je <sup>5</sup> ma <sup>2</sup> , je <sup>2</sup> ŋma <sup>4</sup> (verbless locative)	In past clauses. Anaphoric and 'throwaway'

deictics appear with the tone melody 2.4 and a medial coda glottal stop when they participate in a verbless locative construction with an animate subject. They are also 2.4 in some other syntactic contexts (that appear to be related to features of the subject).

First, while locative deictics behave like nouns in that they can possess other nouns and be adverbialized, they are unlike other nouns in that they cannot be marked with the locative and allative cases. Marking them with these cases is ungrammatical (164, 165).

(164) Locative case is ungrammatical on locative deictics (GE.DGG.20160615)

- a. Proximal: \*nu<sup>5</sup>a<sup>2</sup>gu<sup>2</sup> tʃa<sup>3</sup>ʔã<sup>3</sup>pa<sup>4</sup>ta<sup>3</sup>  
 nu<sup>5</sup>a<sup>2</sup> = gu<sup>2</sup> tʃa<sup>3</sup> =      ã<sup>3</sup> \*pa<sup>4</sup>ta<sup>3</sup>  
 DLOC:here = LOC 1SG.MC.A = have \*house  
 Attempted reading: 'I live (lit. have my house) here.'  
 Cf. acceptable nu<sup>5</sup>a<sup>2</sup> tʃa<sup>3</sup>ʔã<sup>3</sup>pa<sup>4</sup>ta<sup>3</sup> 'I live here'
- b. Distal: \*je<sup>5</sup>a<sup>2</sup>ma<sup>3</sup>gu<sup>2</sup> tʃa<sup>3</sup>ʔã<sup>3</sup>pa<sup>4</sup>ta<sup>3</sup>  
 je<sup>5</sup>a<sup>2</sup> = gu<sup>2</sup> tʃa<sup>3</sup> =      ã<sup>3</sup> \*pa<sup>4</sup>ta<sup>3</sup>  
 DLOC:here = LOC 1SG.MC.A = have \*house  
 Attempted reading: 'I live (lit. have my house) there.'  
 Cf. acceptable je<sup>4</sup>a<sup>2</sup>ma<sup>3</sup> tʃa<sup>3</sup>ʔã<sup>3</sup>pa<sup>4</sup>ta<sup>3</sup> 'I live there'

(165) Allative case is ungrammatical on locative deictics (GE.DGG.20160615)

- a. Proximal: \*nu<sup>5</sup>a<sup>2</sup>wa<sup>5</sup> tʃa<sup>3</sup>ʔũ<sup>43</sup>  
 nu<sup>5</sup>a<sup>2</sup> = wa<sup>5</sup> tʃa<sup>3</sup> =      ã<sup>43</sup>  
 DLOC:here = ALL 1SG.MC.A = come/go.SGACT  
 Attempted reading: 'I'm coming here.'  
 Cf. acceptable nu<sup>5</sup>a<sup>2</sup> tʃa<sup>3</sup>ʔũ<sup>43</sup> 'I'm coming here'
- b. Distal: \*je<sup>4</sup>a<sup>2</sup>ma<sup>3</sup>wa<sup>5</sup> tʃa<sup>3</sup>ʔũ<sup>43</sup>  
 je<sup>4</sup>a<sup>2</sup>ma<sup>3</sup> = wa<sup>5</sup> tʃa<sup>3</sup> =      ã<sup>43</sup>  
 DLOC:there = ALL 1SG.MC.A = come/go.SGACT  
 Attempted reading: 'I'm going there.'  
 Cf. acceptable je<sup>4</sup>a<sup>2</sup>ma<sup>3</sup> tʃa<sup>3</sup>ʔũ<sup>43</sup> 'I'm going there'

This effect is specific to the locative and allative cases. The locative deictics *can* be marked with the purposive case in sentences like je<sup>5</sup>a<sup>2</sup>ma<sup>3</sup>ka<sup>1</sup> tʃa<sup>3</sup>dau<sup>2</sup> 'I'm looking for there (i.e. that place)'

(GE.DGG.20160615). This converges with the possession behavior to indicate that the locative deictics are nouns and are not categorically unable to take case.

It is also important that the effect in (164) and (165) is a property specifically of locative deictics, not of deictics in general or nouns denoting locations in general. When a pronoun, referential noun, or nominal deictic appears in the role of the locative deictic in the constructions in (164) and (165), it is obligatorily marked with the relevant case.

Second, locative deictics pattern with nouns marked with the allative and locative in that they delete following pre-proclitics. As an example, recall that the verb stem  $\eta u^3$  'arrive' has a pre-proclitic  $i^5=$  as an arbitrary part of its exponence. This pre-proclitic deletes following the allative and locative. It also deletes following all four of the locative deictics (166). I exemplify here with  $\eta u^3$  because it is a very common verb, but the same facts hold for other verb stems with non-productive pre-proclitics, including non-motion verbs such as  $\eta u^1 \tilde{e}^4 \tilde{e}^3$  'wait for someone.'

(166) Locative deictics delete following frozen pre-proclitics

- a. Proximal:  $nu^5 a^2 tfa^3 \eta u^3$  'I arrived here' (DGG, dit 0:50)
- b. General nonpast:  $\eta e^5 ma^2 tfa^3 \eta u^3$  'I arrive there' (DGG, kug 1:25)
- c. General past:  $je^5 ma^2 tfa^3 \eta u^3$  'I arrived there' (DGG, kug 0:24)
- d. Distal:  $je^5 a^2 tfa^3 \eta u^3$  'I arrived there' (MFC, mbu 1:45)

All of the phenomena discussed so far are compatible with an analysis of the locative deictics as being covertly marked for either the locative or the allative case. Evidence that the locative deictics are specifically marked for the allative comes from the ablative enclitic  $=ne^5$ . This affix can appear on locative deictics without a preceding token of the allative (167). With pronouns, referential nouns, and nominal deictics, however, it can appear only if a token of the allative case appears earlier in the word (cf. above).

(167) Source affix  $=ne^5$  can appear directly on locative deictics

$tfo^{31} ri^3 pa^3 pa^5 ri^1 je^5 a^2 ma^3 ne^5 na^4 \tilde{u}^{43}$ .

$tfo^{31} ri^3$        $pa^3 pa^5 ri^1$      $je^5 a^2$        $-ma^3 =ne^5$      $na^4 =$                        $\tilde{u}^{43}$   
1SG.AL.POSS father TOP DLOC.DIST -INFO -SOURCE 3.NonI.SBJ.MC.A = come/go.SGACT

'My father came (here) from there.' (HCG, hbu 0:27)

Because of the behavior relative to  $=ne^5$  shown in (167), I analyze the locative deictics as having covert allative case rather than either (a) having a covert underspecified spatial case or (b) displaying their unusual case behavior for exclusively semantic reasons.

## 11.2 Case on pronouns

Many CT pronouns undergo forward-looking allomorphy triggered by case markers, the inalienable possession construction, and the alienable possession construction. In this subsection, I discuss the allomorphy proper (§11.2.1); the morphology of pronouns outside of these constructions (§11.2.2); and the issues of locality and directionality which are raised by pronominal allomorphy (§11.2.3).

Table 13: Case and possession paradigms for pronouns (most data from GE.LCS.20160616)

Pronoun	Case							
	Caseless	ACC	IBEN	RCP	ALL	LOC	COM/INST	PURP
1SG	*tʃo <sup>1</sup>	tʃo <sup>31</sup> = ʔi <sup>3</sup>	tʃo <sup>31</sup> = ʔi <sup>5</sup>	tʃo <sup>3</sup> = ʔna <sup>1</sup>	tʃo <sup>31</sup> = wa <sup>5</sup>	tʃo <sup>31</sup> = gu <sup>2</sup>	tʃo <sup>31</sup> = ma <sup>4</sup> ʔā <sup>3</sup>	tʃau <sup>1</sup> = ʔka <sup>1</sup>
2SG	*ku <sup>1</sup>	ku <sup>31</sup> = ʔi <sup>3</sup>	ku <sup>31</sup> = ʔi <sup>5</sup>	ku <sup>3</sup> = ʔna <sup>1</sup>	ND	ND	ku <sup>31</sup> = ma <sup>4</sup> ʔā <sup>3</sup>	ku <sup>31</sup> = ʔka <sup>1</sup>
3.NonI	*ni <sup>31</sup>	ni <sup>31</sup> = ʔi <sup>3</sup>	ni <sup>31</sup> = ʔi <sup>5</sup>	ni <sup>3</sup> = ʔna <sup>1</sup>	na <sup>43</sup> = wa <sup>5</sup>	na <sup>43</sup> = gu <sup>2</sup>	na <sup>43</sup> = ma <sup>4</sup> ʔā <sup>3</sup>	na <sup>31</sup> = ʔka <sup>1</sup>
3.F	*ŋi <sup>1</sup>	ŋi <sup>31</sup> = ʔi <sup>3</sup>	ND	ŋi <sup>3</sup> = ʔna <sup>1</sup>	ŋi <sup>31</sup> = wa <sup>5</sup>	ŋi <sup>31</sup> = gu <sup>2</sup>	ŋi <sup>31</sup> = ma <sup>4</sup> ʔā <sup>3</sup>	ŋi <sup>31</sup> = ʔka <sup>1</sup>
3.I	*ti <sup>31</sup>	ti <sup>31</sup> = ʔi <sup>3</sup>	ti <sup>31</sup> = ʔi <sup>5</sup>	ti <sup>3</sup> = ʔna <sup>1</sup>	ti <sup>31</sup> ma <sup>2</sup> = wa <sup>5</sup>	ti <sup>31</sup> ma <sup>2</sup> = gu <sup>2</sup>	ti <sup>31</sup> ma <sup>2</sup> = ma <sup>4</sup> ʔā <sup>3</sup>	ti <sup>31</sup> ma <sup>2</sup> = ka <sup>1</sup>
1INCL	*ji <sup>1</sup>	ti <sup>31</sup> = ʔi <sup>3</sup>	ti <sup>31</sup> = ʔi <sup>5</sup>	ti <sup>3</sup> = ʔna <sup>1</sup>	ta <sup>31</sup> = wa <sup>5</sup>	ta <sup>31</sup> = gu <sup>2</sup>	ta <sup>31</sup> = ma <sup>4</sup> ʔā <sup>3</sup>	ta <sup>1</sup> = ʔka <sup>1</sup>
1EXCL	*to <sup>3</sup>	to <sup>31</sup> = ʔi <sup>3</sup>	ND	to <sup>3</sup> = ʔna <sup>1</sup>	to <sup>31</sup> = wa <sup>5</sup>	to <sup>31</sup> = gu <sup>2</sup>	to <sup>31</sup> = ma <sup>4</sup> ʔā <sup>3</sup>	to <sup>3</sup> = ʔka <sup>1</sup>
2.PL	*pe <sup>3</sup>	pe <sup>31</sup> = ʔi <sup>3</sup>	ND	pe <sup>3</sup> = ʔna <sup>1</sup>	ND	ND	pe <sup>31</sup> = ma <sup>4</sup> ʔā <sup>3</sup>	ND

Pronoun	Possession	
	Inalienable	Alienable
1SG	tʃau <sup>1</sup> -	tʃo <sup>31</sup> = ʔri <sup>3</sup>
2SG	ku <sup>43</sup> -	ku <sup>31</sup> = ʔri <sup>3</sup>
3.NonI	na <sup>4</sup> - (III/IV), na <sup>2</sup> - (II)	no <sup>51</sup> = ʔri <sup>3</sup>
3.F	ŋi <sup>43</sup> -	ŋi <sup>31</sup> = ʔri <sup>3</sup>
3.I	ti <sup>31</sup> ma <sup>2</sup> -	ti <sup>31</sup> ma <sup>2</sup> -ri <sup>3</sup>
1INCL	ta <sup>4</sup> -	to <sup>51</sup> = ʔri <sup>3</sup>
1EXCL	to <sup>31</sup> -	to <sup>31</sup> = ʔri <sup>3</sup>
2.PL	pe <sup>31</sup> -	pe <sup>31</sup> = ʔri <sup>3</sup>

### 11.2.1 Allomorphy of pronouns

CT has nine morphologically distinct pronouns: two singular Speech Act Participant (SAP) pronouns, 1SG and 2SG; three plural SAP pronouns, 1INCL (which some speakers treat as dual, 1 + 2), 1EXCL, and 2PL; and three third person pronouns, 3.NonI, 3.I, and 3.F (on which see §10.4). There is no distinct 3PL pronoun.

Table 13 provides the case and possession paradigms for all of the first and third person pronouns. The 'caseless' forms in Table 13 are shown with asterisks because they are not acceptable in isolation. I discuss possible reasons for their unacceptability below.

Despite the large number of surface-different forms in each row of Table 13, it is possible to define the entire paradigm of most pronouns using only four stems: the caseless stem; the stem for primarily grammatical cases; the stem for primarily spatial cases; and the inalienable possession stem. The stem for primarily grammatical cases appears with the accusative, intransitive beneficiary, and recipient cases. It always has the underlying tone 31, and it surfaces with this tone in the accusative and intransitive beneficiary cases. It surfaces with tone 3 in the recipient case. I take this as evidence that the recipient case induces the nominalizer tone circle (which takes 31 to 3) on pronouns.

The stem for primarily spatial cases appears in the allative, locative, and comitative/instrumental. In the 1SG, 3.F, and 1EXCL, it is the same as the stem for primarily grammatical cases; in the 3.NonI and 3.I, it is the same as the inalienable possession stem. The inalienable possession stem appears in inalienable possession constructions and as the base of the purposive case. In the purposive, it undergoes the same tonal alternations as are found in the nominalizer tone circle. The alienable possession pronouns are usually formed on the stem for primarily grammatical cases rather than the alienable possession forms. The 3.NonI and 1INCL pronominal stems, however, display unpredictable stems in the alienable possession form. While the tones of the pronominal

stems for primarily grammatical cases are all 31, the tones of these two pronominal stems, like those of the caseless pronouns, differ between pronouns.

Note the recipient case, purposive case, and alienable possession forms include a glottal stop following the pronominal stem for all of the monosyllabic pronouns. For the recipient case and purposive case, this is due to syllable-counting allomorphy which also applies following nouns. For the alienable possession forms, the glottal stop cannot be attributed to syllable-counting allomorphy, because the alienable possession enclitic for all nouns, including monosyllabic nouns, is = $\tilde{a}^1ri^3$  rather than = $?ri^3$ .

### 11.2.2 Caseless pronouns

There are many environments where pronouns are not marked with case. For example, object reflexive/reciprocal pronouns, subject pronouns, and pronouns which are not the final element of their noun phrase cannot be case-marked. Pronouns which are not case-marked appear in the caseless stem. They must, in addition, bear either (a) the reflexive/reciprocal marker - $gi^1$ , (b) a lexical clitic like = $i^1ka^5$  'only (scalar focus)' or = $i^5ra^1$  'first,' or (c) the clitic = $ma^2$ . = $ma^2$  is by far the most common element to appear on non-case-marked pronouns. It appears on all caseless pronouns which are not reflexive or marked with lexical clitics; it obligatorily precedes some clitics, such as = $ta^1ma^3$  'only (alternative focus)'; and speakers always use it when asked for the citation forms of pronouns.

Given this distribution, I hypothesize that pronominal = $ma^2$  is semantically empty and appears in these environments because of a disyllabic minimum word requirement on pronouns. Although it appears on almost all subject pronouns, it is not the exponent of nominative case on pronouns, since it is licit for a pronoun with a lexical clitic and no = $ma^2$  to appear as the subject of a sentence (e.g.  $ni^{31}?i^5ra^1$  'he first').

### 11.2.3 Locality of pronominal allomorphy

The interactions between case and other affixes and clitics indicate that the allomorphy triggered by case markers requires strict locality. When a third person pronoun bears both the plural clitic = $gi^4$  and case, the plural and the case marker may appear in either order (with no apparent scopal difference). If the plural clitic is adjacent to the stem, then the pronoun appears in the form selected by the plural, which is the caseless stem followed by = $ma^2$  (168a). If the case marker is adjacent, on the other hand, the pronoun appears in the allomorph selected by that case (168b).

(168) Ordering of plural clitic = $gi^4$  and case (GE.DGG.20160620)

- a. Plural allomorph appears with plural inside recipient case:  $ti^{31}ma^2gi^4na^1tfa^3dau^2$

$ti^{31}$  =  $ma^2$  =  $gi^4$  =  $na^1$   $tfa^3$  =  $dau^2$

3.I.PRO = PRO = PL = RCP 1SG.SBJ.MC.A = see

'I took care of them (Class I).'

- b. Recipient case allomorph appears with recipient case inside plural:  $ti^{31}?na^1gi^4tfa^3dau^2$

$ti^{31}?$  =  $na^1$  =  $gi^4$   $tfa^3$  =  $dau^2$

3.I.PRO = RCP = PL 1SG.SBJ.MC.A = see

'I took care of them (Class I).'

The reflexive/reciprocal element  $-gi^1$ , unlike the plural, must appear inside of case. It selects the caseless form of the pronoun. When the reflexive/reciprocal co-occurs with a case marker, as in reflexive obliques, the pronoun continues to appear in the caseless form. It never 'looks past' the reflexive/reciprocal to appear in the allomorph selected by the case.

### 11.3 Non-inflectional nominal morphology

CT displays very little nominal morphology other than possession, case, and noun class agreement morphology. It does display a large number of enclitics which can potentially appear on and scope over a noun phrase -- perhaps 50. There are very few enclitics, though, which must select as an N(P) as the host. Most of the enclitics that can appear on and scope over a noun phrase can also appear on and scope over an adverb, a V(P), or a clause, with no difference in meaning. There is no evidence that the language has true nominal affixes, defined as bound morphs that appear only on nouns, scope over only the root, and appear inside of clitics. The few items which meet all of these criteria -- the type-indicating syllable of nominal deictics, the agreement markers that appear on nominal deictics, and the pronominal reflexive/reciprocal element  $-gi^1$  -- are limited to tiny, closed subclasses of nouns.

With this background, in this section I describe two sets of nominal clitics. In §11.3.1, I describe seven clitics which can only be positioned relative to an NP. In §11.3.2, I describe three clitics which can be positioned relative to either the NP or another constituent, but which express a different meaning when they appear on an NP than when they appear on another constituent. I bracket all clitics which can be positioned relative to NP but can also be positioned relative to other constituents. These include clause-linking clitics like  $=we^5na^1$  'and then'; adverb-like clitics, such as  $=i^5ra^1$  'first'; information-structural clitics, such as  $=ta^1\tilde{a}^3$  'exactly'; quantificational clitics, such as  $=ri^5ka^4$  'exclusive focus'; and clitics that are non-intersective modifiers, such as  $=\tilde{r}i^5\tilde{t}i^2$  'real/really.'

#### 11.3.1 Clitics specific to the noun phrase

The corpus contains examples of seven derivational morphs which apply only to nouns or noun phrases. Four of them -- three of the affixes and one of the clitics -- are word class-changing, deriving a predicate or adverb from a noun. I first describe the word class-changing morphology, then the morphology that does not affect word class.

The word class-changing morphs are  $=e^3$ , which derives dynamic verbs;  $=ra^1\tilde{r}i^4$ , which derives stative verbs referring to the properties of kinds;  $=ki^5na^1$ , an adverbializer similar to the English word 'time' in its use as an adjunct; and  $=\tilde{a}^1$ , which derives attributive predicates.

**The verbalizer**  $=e^3$  This enclitic applies to alienable nouns and to inalienable nouns bearing the default possessor morph. It derives, from a noun N, an  $\alpha$ -class verb stem meaning 'do an action stereotypically associated with N.' I use the vague term 'associated' here because the noun which is the morphological base of the verb can be related to the action of the derived verb in a variety of ways: it may be an instrument (169a), a location (169b), or a theme (169c). Verbs derived

with the  $-e^3$  verbalizer can be either intransitive or transitive. I have no evidence about whether  $-e^3$  can appear on a complex NP.

(169) Verbs derived with the general verbalizer  $-e^3$

a. Noun is instrument for derived verb:

$no^{51}\gamma ri^3 pu^3 ra^3 ki^4 ji^1 \gamma i^1 na^4 \gamma na^2 po^{43} wa^3 e^3 gi^5 \gamma i^4$

$no^{51}\gamma ri^3 pu^3 ra^3 ki^4 -\emptyset ji^1 \gamma i^1 na^4 \gamma na^2 =$

3.AL.POSS work -NMLZ:event 3.NonI.SBJ.COP.SC COMP 3.NonI.SBJ.SC.A =

$po^{43} wa^3 = e^3 = gi^4 -\gamma i^4$

fishhook = VBLZ = PL -SUB

'Their work is to fish (with a hook and line).' (SSG, iia 1:24)

b. Noun is location where action of derived verb is performed:

$na^4 na^{43} \gamma ta^2 m\tilde{i}^4 e^3 gi^4 ri^1 \dots$

$na^4 = na^{43} - * \gamma ta^2 m\tilde{i}^4 = e^3 = gi^4 ri^1$

3.NonI.SBJ.MC.A = DEF.POSS- *restinga* = VBLZ = PL and

'They go hunting on the *restingas*.' (LCS, lkn 1:53)

c. Noun is theme of derived verb:

$na^2 mai^3 \gamma ku^5 e^3 gi^5 \gamma i^4$

$na^2 = mai^3 \gamma ku^5 = e^3 = gi^4 -\gamma i^4$

3.NonI.SBJ.SC.A Squirrel.Monkey = VBLZ = PL -SUB

'They hunt Squirrel Monkeys.' (LCS, lkn 2:06)

**The verbalizer =  $ra^5 \gamma i^1$**  This element applies to alienable nouns, inalienable nouns bearing any possessive prefix, and pronouns (in the inalienable possession form). It typically derives, from a noun N, a stative *a*-class verb stem meaning 'be of the same kind as N, have the properties associated with N.' With at least some nouns, it can also derive a dynamic, transitive *a*-class verb stem meaning 'do something that has the properties of N.' (170) provides examples of the verbalizer. Verbs derived with  $= ra^1 \gamma i^4$  are often nominalized with the class nominalizers, as in (170b). As with  $-e^3$ , I have no evidence about whether this morph can appear on a complex NP.

(170) Verbs derived with the verbalizer  $-ra^5 \gamma i^1$  'have properties of N'

a.  $ta^4 t\gamma au^1 e^3 \gamma a^1 ra^5 \gamma i^1$

$ta^4 = t\gamma au^1 - *e^3 \gamma a^1 = ra^5 \gamma i^1$

3.I.SBJ.MC.A = 1SG- \*sister = have.properties.of

'She looks like my sister.' (GE.LCS.20160613)

b.  $ma^3 ri^3 na^4 na^3 to^1 ra^5 \gamma i^1 i^4 \eta \tilde{e}^4 \gamma ma^2 na^{43} ki^3 ma^3 gi^4$

$ma^3 ri^3 na^4 = na^3 = to^1 = ra^5 \gamma i^1 i^4$

now 3.NonI.SBJ.MC.A = 3.NonI.OBJ.MC.A = other -have.properties.of NCL:IV

$\eta \tilde{e}^4 \gamma ma^2 na^{43} - *ki^3 ma^3 = gi^4$

DNOM.ANA.IV DEF.POSS- habit -PL

'Now they do things differently.' (Very lit.: 'Now they do habits of a different kind.') (commenting on how people in Cushillococha sell food to each other for cash) (EGC, ebu 2:21)

The semantic contrasts between  $=ra^5\tilde{r}^1$  and other expressions of similarity are subtle. I illustrate them with the 1SG pronoun. I can refer to people who belong to my ethnic group, belong to my clan, share my profession, or speak the same language as me as  $tfa^1 = ra^5\tilde{r}^3 - \tilde{r}^4$  (1SG-have.properties.of-NMLZ) 'people who are the same as me.' This expression, though, does not denote the same set of people as  $tfa^1 = ri^5\tilde{r}^1$  (1SG = like) 'people who are like me,' because  $tfa^1 = ri^5\tilde{r}^1$  can denote people who are similar to me in any way (GE.LCS.20160630). It also contrasts with  $tfa^1 - *ta^3ni^3\tilde{r}^4$  'people belonging to the same group as me,' which can denote anyone who belongs to the same social group as me, even if the existence of the group is transitory.

**The adverbializer  $-ki^5na^1$**  The clitic  $=ki^5na^1$  appears on a noun that expresses a quantity and derives an adverb meaning 'N number of times.' The only noun on which  $=ki^5na^1$  can appear without any intervening morphology is  $wi^4\tilde{r}^4$  'one' (>  $wi^4\tilde{r}^4ki^5na^1$  'once'). With all other nouns, including higher numerals, the quantifier must bear the inalienably possessed noun  $*e^1pi^1$  'quantity' before  $=ki^5na^1$ . This yields items such as  $ta^2\tilde{r}e^4 - *e^1pi^1 - ki^5na^1$  (two-\*quantity-time) 'twice' and -- with a zero nominalization of  $m\tilde{u}^4$  'be numerous' --  $m\tilde{u}^4e^1pi^1ki^5na^1$  (be.numerous-NMLZ:state-\*quantity-time) 'many times.'

**The attributive  $=\tilde{a}^1$**  The verbalizer  $=\tilde{a}^1$  derives an *a*-class predicate meaning 'have (referent of NP).' It can appear on both alienable noun phrases and inalienable nouns with NP possessors or the default possessor prefix (171). I have no data about whether this item can also occur on inalienable nouns with other possessive prefixes. The semantic contrast between possessive predicates with  $=\tilde{a}^1$  and analytic possessive predicates (in which the possessor is expressed as the beneficiary to an existential predicate) is information-structural, with  $=\tilde{a}^1$  appropriate when the possessor is topic or focus and analytic predicates appropriate when the possessum is topic or focus.

(171) Predicates derived with  $=\tilde{a}^1$

a.  $tfa^3pe^4\tilde{r}fi^2\tilde{a}^1$

$tfa^3 = pe^4\tilde{r}fi^2 = \tilde{a}^1$   
1SG.SBJ.MC.A = basket = have

'I have a basket.' (GE.LCS.20150719)

b.  $tfa^3ta^3\tilde{r}^4i^4tfo^4\tilde{r}ni^5\tilde{a}^1$

$tfa^3 = ta^4\tilde{r}^4i^4tfo^4\tilde{r}ni^5 = \tilde{a}^1$   
1SG.SBJ.MC.A = be.big -NMLZ:IV NCL:IV fish = have

'I have a big fish.' (GE.SSG.20150718)

c.  $tfa^3na^3ma^1\tilde{r}fi^3\tilde{a}^1$

$tfa^3 = na^3 - *ma^1\tilde{r}fi^3 = \tilde{a}^1$   
1SG.SBJ.MC.A = DEF.POSS- \*meat = have

'I have (some) meat.' (GE.LCS.20150719)

**Word class-maintaining clitics.** The word class-maintaining clitics are  $=ri^3ki^1$  'pseudo,'  $=na^4\tilde{r}ka^1$  'made of,' and  $=ki^1\tilde{a}^1$  'people from.'  $=ri^3ki^1$  appears on a noun and derives a noun meaning 'something that behaves like an N, but is not,' for example in the words  $tfa^1 - *e^3\tilde{r}a^1 = ri^3ki^1$  (1SG-\*sister = pseudo) 'my stepsister' or  $ai^3\tilde{r}u^5 = ri^3ki^1$  (dog = pseudo) 'something that seems like a dog,

but isn't' (GE.SSG.20160720). =  $na^4\eta ka^1$  'made of' appears on a noun phrase and derives a noun phrase meaning 'N (referent) made out of N (base).'

=  $k\ddot{i}^1\tilde{a}^1$  appears on a noun phrase denoting a location and derives a noun phrase referring to people from that location, as in the expressions  $Ki^3\eta t\ddot{f}i^3tu^1k\ddot{i}^1\tilde{a}^1$  'people from Cushillococha' and  $nu^5a^2 da^1a^1 i^3a^1ne^1k\ddot{i}^1\tilde{a}^1$  'people from this town here' in (172).  $*k\ddot{i}^1\tilde{a}^1$  is also an inalienably possessed noun meaning 'clan.'

(172)  $ki^3\eta t\ddot{f}i^3tu^1k\ddot{i}^1\tilde{a}^1, nu^5a^2 da^1a^1 i^3a^1ne^1k\ddot{i}^1\tilde{a}^1 ga^4, ta^4ma^3 na^4ja^3\eta\tilde{o}^2\dots$

$ki^3\eta t\ddot{f}i^3tu^1$  =  $k\ddot{i}^1\tilde{a}^1$   $nu^5a^2$   $da^1a^1$   $i^3a^1ne^1$  =  $k\ddot{i}^1\tilde{a}^1$   $ga^4$   $ta^4ma^3$   
 Cushillococha = from DLOC:here DNOM.PROX:III town = from NCL:PST NEG  
 $na^4ja^3$  =  $\tilde{o}^2$   
 3.NonI.SBJ > 3.NonI.OBJ.MC.I = believe

'People from Cushillococha, from this town here, did not believe...' (MFC, mkn 0:20)

### 11.3.2 Clitics with different readings on nouns

There are three clitics which can appear on any constituent, but have significantly different semantics on nouns. These are the plural clitic =  $gi^4$  and the clitics =  $t\ddot{f}i^4re^1$  and =  $t\ddot{f}a^1i^1$ , which express nominal tense on nouns but have non-tense meanings on other constituents.

The plural clitic =  $gi^4$  appears on nouns and verbs only. It always expresses the plural, but differs in scope between NPs and VPs. When =  $gi^4$  appears on an NP, it can quantify either the head of the NP (173a,c) or a third-person possessor of the head (173b,d). On a VP, it can quantify over any of the participants, or it can express that the action of the verb is performed multiple times. These higher-scoping readings are not available on NPs. Unlike other exponents of nominal and verbal number, the plural clitic is never obligatory.

(173) Scope of plural clitic =  $gi^4$  on complex NP

a. Plural on possessum scopes over possessum:

$no^{51}\eta ri^3 \eta e^5ma^2\eta\tilde{a}^4 gi^4 ri^1 na^4na^3-comparte$

$no^{51}\eta ri^3 \eta e^5ma^2 -\eta\tilde{a}^4 = gi^4 ri^1 na^4 = na^3 =$

3.AL.POSS DLOC.ANA -NMLZ:IV -PL TOP 3.NonI.SBJ.MC.A = 3.NonI.OBJ.MC.A

comparte

Sp: *compartir*

'They share their possessions.' (EGC, bti 0:47)

b. Plural on possessum scopes over possessor:

$no^{51}\eta ri^3 no^{31}\eta\tilde{e}^5 = gi^4$  (3.AL.POSS grandmother = PL) 'their grandmother' (GE.LCS.20160620)

c. Plural on inalienable possessum scopes over possessum:

$na^4-*e^5ga^3 = gi^4$  (3.POSS-\*name = PL) 'their names' (GE.LCS.20160620)

d. Plural on inalienable possessum scopes over possessor:

$na^4-*e^5ga^3 = gi^4$  (3.POSS-\*name = PL) 'their name' (GE.LCS.20160620)

The clitics =  $t\ddot{f}i^4re^1$  and =  $t\ddot{f}a^1i^1$ , when they are positioned relative to an NP, respectively express past and future nominal tense. (174) provides examples of =  $t\ddot{f}i^4re^1$  expressing past nominal tense, and (175) of =  $t\ddot{f}a^1i^1$  expressing future nominal tense.

(174) Past nominal tense use of =  $t\dot{f}i^4r\dot{e}^1$  (GE.KSC.20150808)

- a.  $t\dot{f}au^1te^4t\dot{f}i^4r\dot{e}^1$  (1SG-<sup>\*</sup>husband = former) 'my former husband'  
 b.  $o^43re^3a^1ri^3 u^3ru^5i^1t\dot{f}i^4r\dot{e}^1$   
 $o^43re^3 = a^1ri^3 \quad u^3 -ru^5i^1 \quad = t\dot{f}i^4r\dot{e}^1$   
 word = AL.POSS say -NMLZ:agent = former  
 'the former pastor'

(175) Future nominal tense use of =  $t\dot{f}a^1i^1$  (GE.ABS.20160804)

- a.  $t\dot{f}o^1\eta ma^1t\dot{f}a^1i^1$  (1SG-<sup>\*</sup>wife = future) 'my future wife'  
 b.  $t\dot{o}^1t\dot{f}a^1i^1$  (Night.Monkey = future) 'something that will become a Night Monkey'

When these clitics are positioned relative to a verb phrase, =  $t\dot{f}i^4r\dot{e}^1$  is a frustrative of result, indicating that the action of the verb took place but did not achieve the outcome which one would anticipate. =  $t\dot{f}a^1i^1$  can encode either prospective aspect or a meaning like the English verb 'want.'

Additionally, =  $t\dot{f}i^4r\dot{e}^1$ , but not =  $t\dot{f}a^1i^1$ , can be used as a second-position clitic. In this use, =  $t\dot{f}i^4r\dot{e}^1$  encodes that the stance expressed by the clause is incongruent with (a) a presupposition, entailment, or implicature of a preceding turn in the discourse (regardless of whether the speaker or another participant said the incongruent turn) or (b) with what one of the participants is doing or planning to do in the world. (176) provides examples of these senses.

(176) Second-position clitic use of =  $t\dot{f}i^4r\dot{e}^1$

- a. Incongruent with preceding turn in discourse

$\eta e^3ma^2 pe^3ga^1 ri^1 na^4 chino = gi^4ga^1wa^5 pi^2de^43a^2gi^4ki^5ra^1i^3\eta^4, "na^4na^4ri^3gi^1 to^31\eta^5$

$\eta e^3ma^2 \quad pe^3 = ga^1 \quad ri^1 \quad na^4\eta \quad chino \quad = gi^4 = ga^1 \quad = wa^5 \quad pi^2 =$

DNOM.ANA:IV 2.PL = voice TOP COMP Sp:chino = PL = voice = ALL 2PL.SBJ.SC.I =

$de^43a^2 = gi^4 = ki^5ra^1i^3 -\eta^4 \quad na^4 = \quad na^4 = \quad ri^3gi^1 \quad to^31 \quad = \eta^5$

talk = PL = INFER = SUB QUOT = 3.NonI.SBJ.MC.A = QUOT 1EXCL = IBEN

"That language of yours, it sounds like you're talking in Chinese," he said to us.'

$\eta e^4\eta gu^2ma^3 na^4, "ta^4ma^3t\dot{f}i^4r\dot{e}^1 ni^41\eta^4 chino = gi^4ga^1wa^5 ti^2de^43a^2gi^5\eta, "a^4 to^31ma^2 na^5ta^2gi^3\eta^4$   
 $ni^31\eta^5$

$\eta e^4\eta gu^2ma^3 na^4 ta^4ma^3 = t\dot{f}i^4r\dot{e}^1 \quad ni^41\eta^4 \quad chino \quad = gi^4 = ga^1 \quad = wa^5$

SO.NPST SO NEG = actually PRED.FOC Sp:chino = PL = voice = ALL

$ti^2 = \quad de^43a^2 = gi^4 = \eta \quad a^4 \quad to^31ma^2 \quad na^5 = \quad ta^2 =$

1EXCL.SBJ.SC.I = talk = PL = SUB NCL:PST 1EXCL QUOT = 1EXCL.SBJ.MC.A =

$gi^3 \quad = \eta^4 \quad ni^31 = \eta^5$

QUOT.SC = SUB 3 = IBEN

'Then we said to him, "Actually, it's not the case that we're talking in Chinese.'" (KSC, kiq 1:30)

- b. Incongruent with actual action of participant

Context: A taxi driver is picking up a woman at the side of road. She moves to get into the side of the taxi closer to the edge of the road. The taxi driver tosses his head toward the far side (where I am) and says:  $nu^5a^2t\dot{f}i^4r\dot{e}^1$

$nu^5a^2 \quad = t\dot{f}i^4r\dot{e}^1$

DLOC:here = actually

'No, over here.' (OS 20160729)

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