A PHONOLOGICAL DESCRIPTION OF "PET TALK" IN ARARA

by

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ABBREVIATIONS AND SYMBOLS

A	Subject of transitive clause
Abs	Absolutive
Adjr	Adjectivizer
Admon	Admonition
Aff	Affirmative mood
Aug	Augmentative
Caus	Causative
Dir	Direction
Dist	Distal
DO	Direct object
Ela	Elative case
Erg	Ergative
Excl	Exclusive
Fem	Feminine
Hort	Hortatory
Imp	Imperative
Imperf	Imperfective
Inc	Inceptive
Incl	Inclusive
Iter	Iterative
lit	Literally
LUD	Ludlingant
Mur	Murmured
N	Noun
Neg	Negation
Nmlz	Nominalizer
O	Object
Past	Past
p.c.	Personal communication
Perf	Perfective aspect
Perm	Permission
PL	Plural
PN	Proper name
Poss	Possessive

Pred	Predicate
Pres	Present tense
Prog	Progressive aspect
Purp	Purposive
Q	Question Particle
Rec	Recent past
Refl	Reflexive
Rem	Remote past
Rhet	Rhetorical question
S	Subject
sp.	Species
T	Prefix /tɯ-/ and its allomorphs
UF	Underlying Form
Uni	Universal time (Incompletive?)
Verb	Verbalizer
1	First person
2	Second person
3	Third person
12	First person inclusive
/ /	Abstract representation
[ ]	Phonetic representation
+	Morpheme boundary
.	Syllable boundary
V̆	A weak vowel that can be deleted

ABSTRACT

The Arara people of Para, Brazil, as a whole, are remnants or survivors of some larger Cariban groups who descended from the headwaters of the upper Xingu to the mid and low areas of this river by the beginning of the nineteenth century. Now they live in three different villages: Maia, Cachoeira Seca and Laranjal.

The present thesis aims to describe thirteen different *ludlings* or "play languages" that elderly Arara people from Laranjal know and sometimes use in talking to pets. Play languages are linguistic forms that are purposely manipulated at some level. The strategies which the Arara people use to manipulate the base language to form their ludlings are the addition of affixes and/or certain phonological modifications, such as copying vowels, nasalization, murmur, and lateralization of flaps. The addition of affixes may trigger some phonological processes, such as vowel deletion and haplology. In addition to the ludlings, an informal sketch of Arara phonology is presented as part of the background for the discussion of the "language games", as well as a brief overview of Arara grammar.

CHAPTER 1

INTRODUCTION

This thesis describes thirteen different play languages, or ludlings,[1] that elderly Arara people sometimes use in talking to pets. The use of play languages among the Araras is decreasing, and only elderly people know them. The Arara language is spoken in the state of Pará, Brazil. The data presented here were collected during several years, starting in November, 1982, in the Posto de Vigilância 1, and later, starting in 1994, in the village of Laranjal, under the auspices of the Summer Institute of Linguistic (SIl) and the Brazilian non-governmental organization Associação Linguística Evangélica Missionária (ALEM).[2] Scientific names for plants and animals were collected from different sites on the internet, usually with a picture of each type or species. Arara proper names used in this thesis are from the Arara language (not borrowed from Portuguese).

The strategies that Arara people use to manipulate the base language to form their ludlings in talking to pets are the addition of affixes and/or some phonemic modifications, such as copying vowels, modifying vowels, nasalization, murmur, and lateralization of taps. The addition of affixes may trigger some phonological processes, such as vowel truncation and haplology.

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[1] For a discussion of this term, see Section 4.1.

[2] In 2010 I collected supplementary data following the Institutional Review Board (IRB) policies, under the University of North Dakota (UND), using an Informed Consent document, which was signed by me and by the Arara language resource person.

This thesis consists of four chapters. Chapter one is an introduction where I present the purpose of the thesis and how it is organized. Chapter two presents general information about the Arara people, including a short history of their group. Chapter three presents an overview of Arara phonology, as well as a brief overview of Arara grammar. In the phonological section some phonological phenonema are discussed in prose with no formal representations; in the grammar section, there is a brief sketch that describes grammatical structures of the language that are pertinent to the discussion in the remainder of the thesis. Chapter four deals with word game data and includes the meaning and purpose of the ludlings, presentation of the data, and a summary of their phonological behavior. Closing the thesis, there is a small conclusion section. In addition to this, there are five Appendices: the first one shows contrast among consonants in Arara; the second one presents contrast among vowels in Arara; the third one presents a summary charts of the ludling data forms in isolation or in simple syntactic constructions; the fourth one presents transcriptions of ludlings that were recorded in sentential contexts; the fifth one presents a table for flora and fauna with terminology in Arara, English, Latin (scientific names), and Portuguese.

The Arara data are written with the International Phonetic Alphabet (IPA). Narrow Phonetic transcriptions are shown inside square brackets, while more abstract representations are sometimes shown in slashes and sometimes without any such marks. By abstract representation, I mean any representation that is not phonetic. I do not always intend these to signify an underlying representation, since I will use slashes for various purposes. For example, the same stem can have different abstract forms: /ibɯ/ or /ip/ ‘to take a bath’, depending on what is being presented. Since stress usually falls on the last

syllable of the word, it is not marked in the Arara examples, except in the section about stress (3.1.4).

With this thesis, I document these interesting language games that are very typical of Arara culture. As far as I know, there is very little documented information about any similar ludlings among the other indigenous people groups in Brazil. One of them is about the Palikur people, from the state of Amapá, northern Brazil, written by Diana Green (1998), from the Summer Institute of Linguistics (SIL, Brazil). In her paper she comments that there is a ludling using a reversal strategy in the Guarani language of southern Brazil. Finally, I hope that the Arara people, once aware of studies like this, will continue to use these ludlings in their culture.

As a preview of what is coming later in chapter 4, here are few ludling forms: [paɾu] 'water', but [palugu] 'water (talking to a capuchin monkey)'. In this ludling, they add the infix /-gV-/ to the base word, and change /ɾ/ into [l]. Another example is [wɔt] 'fish', but [idiwɔt] 'fish (talking to a titi monkey)'. In this ludling, they add the prefix /idi-/ to the base word. Finally, [eduet] 'hammock', but [ẽdũẽt] 'hammock' (talking to a howler monkey). In this ludling, they nasalize the vowels of the base word.

CHAPTER 2

GENERAL INFORMATION ABOUT THE ARARA PEOPLE

Various unrelated ethnic groups with unrelated languages in Brazil are referred to as "Arara" by outsiders, including Arara-Karo, from Rondônia,[3] Arara of Acre,[4] Arara of Mato Grosso,[5] and Arara of Pará.

This thesis is a study of the language of the Arara of Pará, a Cariban language (Rodrigues 1986; Meira 2006), ISO 639-3 code *aap*. These people, as a whole, are remnants of some larger Cariban groups who came down from the headwaters of the upper Xingu to the mid and low areas of this river by the beginning of the 19th century (Souza in progress). They now live in three different villages: Maia, Cachoeira Seca and Laranjal. People living in Maia do not speak the Arara language anymore, only Portuguese.

Maia is located on the Xingu River, below the city of Altamira. The residents have had contact with the Juruna people since the 19th century, with whom they merged as one

[3] The Karo language belongs to the Ramarama family, of the Tupi linguistic stock (Rodrigues, 1986). They are located in the southern area of the Lourdes creek, in the State of Rondônia (Gabas Jr., Nilson. www.institutosocioambiental.org.br/pib/epienglish/karo.shtm – accessed on July 19, 2008). Its ISO 639-3 code is *arr* (Gordon 2005).

[4] Also called Apolima-Arara, whose speakers live along the Humaitá River, a tributary of the Tarauacá river, in the state of Acre. The speakers come from different ethnic groups, including Chama, Amoaka, Santa Rosa, Arara and Jaminawa (Padilha, Lindomar. www.amazonlink.org/amazonia/culturas_indigenas/povos/apolina_arara.html – accessed on July 19, 2008). The ISO 639-3 code is *mcd* (Gordon 2005).

[5] Other names for this language are Arara do Beiradão and Arara do Rio Branco. Its ISO 639-3 code is *axg*. The language is almost extinct (Gordon 2005).

ethnic group, as well as with other Brazilian citizens. In the late 1990s, they were recognized as a separate people by the Fundação Nacional do Índio (FUNAI), the Brazilian federal entity that manages indigenous affairs in the country. The residents of the other two Arara villages still speak the Arara language. These villages are located along the left bank of the Iriri River, the largest tributary of the Xingu.

Figure 1: Map of Arara Area[6]

[6] This map was prepared by Jonathan Fuchs, and is used with his permission.

The Arara people living in Laranjal were contacted by FUNAI during two different periods of time: 1981 and 1983. The group contacted in 1981 had fifty people and the other one only twenty. The Arara living in Cachoeira Seca were contacted by the same governmental agency in 1987. They numbered about thirty people. These Arara people as a whole call themselves [ugɔɾɔŋ'mɔ], which is the first person inclusive pronoun. The morphological structure of this word is: [ugɔ'ɾɔ] (first person inclusive) and [-ŋmɔ] (plural) (Souza 2004). Thus, some of them translate the meaning of their autonym as just *nós* in Portuguese ("we" in English).[7]

There are about 335 speakers of Arara living in the villages of Laranjal (about 250) and Cachoeira Seca (about 85). According to my research (Souza in progress), people from these two villages were separated from each other around 1925, when there was a conflict between them on a place along the Iriri River called Cachoeira Grande, close to the mouth of this river, and not very far from Laranjal village. An advocate for the indigenous cause named Afonso Alves da Cruz told me (p.c. 2004) that one day he was traveling in a motor boat along the Iriri River with an Arara family from Cachoeira Seca, and as they were passing by Cachoeira Grande, a woman in the boat, who was the oldest woman from Cachoeira Seca at that time, cried out: "I know this place! It was here that my people separated themselves from the Laranjal people! Piput (the oldest man from Laranjal at that time) was very small! I remember it!" She pointed out that when this happened she was about the same age as a girl from her family, who was six years old. Through an examination of Piput's teeth, dentists from FUNAI estimated the year of his birth as 1922. Since he was not able to remember that story, he would have been three years old or less at the time of the event.[8]

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[7] The first person exclusive pronoun is [tʃimna].

[8] I thank Afonso Alves da Cruz for his long discussions with me about Arara ethnohistory. Without his

Some languages related to Arara are Hixkaryana, Apalaí, Wayway, Makuxi, Taulipang, Waimiri, Atroari, Kuikuro, Bakairi, and Ikpeng (Txikão), among others. By comparing descriptions of these languages (lexicon and morphology) it is possible to state that the closest one to Arara is Ikpeng (Rodrigues 1986).[9]

My first contact with the Arara people from Laranjal was in November 1982. At that time my wife and I spent four months in Posto de Vigilância 1. Between November and December 1986 I spent a month with three young Arara men at this same Posto de Vigilância. Only in 1987 were my wife and I able to start having regular interaction with them. Since that time we have spent several months of every year among the Arara people. During these periods of time, we began studying their language and culture, developed a practical alphabet for writing the language, helped to start a school among them, helped them acquire medicines, helped protect their territory, helped them acquire canoes and sewing machines, and established a nursery for fruit plants and trees such as mahogany to help in their food and money resources, etc.

Only twice was I able to visit people from Cachoeira Seca: the first time by invitation from an anthropologist who was doing studies for the Cachoeira Seca's area demarcation, and the second time by the FUNAI's chief in the Cachoeira Seca village, Afonso Alves da Cruz. I stayed in the village for one week during each trip. However, my main research has been among the Arara from Laranjal. Thus the ludling data I present in this thesis were collected among the Arara living in Laranjal, the only sub-group where these ludlings have been attested.

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knowledge, my studies about these people would have many gaps.

[9] I have personally collected comparative data from some of these languages, including Makuxi, Kuikuro, Bakairi and Ikpeng. These data have not yet been published.

CHAPTER 3

THE ARARA LANGUAGE

3.1 A Brief Overview of Arara Phonology

3.1.1 Phonemic Inventory

The Arara language has twenty-two phonemes: sixteen consonants and six vowels.

A. Consonants

A phonemic consonant chart, used as a basis for systematic transcription, is shown below with the sixteen consonants.

Table 1: Consonants

	Bilabial	Alveolar	Post-Alveolar	Palatal	Velar	Glottal
Stop	p b	t d			k g	
Affricate			ʧ			
Nasal	m	n			ŋ	
Trill	(ʙ̥)					
Tap		ɾ				
Fricative						(h)
Central Approximant	w			j		
Lateral Approximant		l				

In order to confirm the consonant phonemes of the language, I show contrast between some of them in Appendix 1 at the end of this thesis. Of these sixteen consonants, two of them occur rarely: the voiceless bilabial trill [ʙ̥] and the glottal fricative [h]. They occur in a very specific phonological environment. For example, the voiceless bilabial trill occurs in expressive words.[10] In addition to that, it occurs only in

[10] Expressive words resemble ideophones, but have a larger scope of meaning, as can be seen in the examples in (1).

onset position. Furthermore, it only occurs before the vowel [u], which is always followed by an alveolar or palatal consonant. The trill does not occur in proper names. All seven of the words in which it occurs are given in (1) below:

(1)	a.	[ʙ̥utekeni]	‘Orion’s belt, Pleiades’
	b.	[ʙ̥utakeni]	‘small and round cultivated field’
	c.	[ʙ̥ut ʙ̥ut]	‘an insect’
	d.	[ʙ̥uta]	‘to throw away’
	e.	[ʙ̥uta ʙ̥uta]	‘rolling on the ground’
	f.	[ʙ̥utʃak]	‘to shoot an arrow’
	g.	[ʙ̥utʃik]	‘to miss a target/aim’

The glottal fricative occurs only in coda position but never word-finally and, like the voiceless bilabial trill [ʙ̥], is always followed by a coronal consonant, also in a very specific phonological environment. It is present in only four words in the normal language, but also occurs in proper names.

(2)	a.	[mɯhna]	‘there further’
	b.	[muhtɔ]	‘over there’
	c.	[kahtaɾat]	‘fire caterpillar’
	d.	[niahnia]	‘a banana’
	e.	[muhtahta]	‘proper name for a man’
	f.	[mohtidi]	‘proper name for a man’
	g.	[tʃahtʃa]	‘proper name for a woman’

For these reasons [ʙ̥] and [h] are placed within parentheses in the consonant chart. They are excluded from further discussion in this section. It is also worth mentioning that a few expressions sometimes include two implosive stops that are otherwise never used in the lexicon: [ɓ] and [ɗ].[11]

(3)	a.	[ɓɔh]	‘(s/he is) lying down in a hammock’
	b.	[ɗah ketkɔ]	‘sit down!’

Because of their specific occurrence in special expressions, they are not included in the Arara phonemic inventory.

[11] The only exception in the whole Arara language is [ɓak keni] ‘hoe’.

In normal speech, the voiced bilabial and alveolar stops have an optional lenis realization intervocalically: [β] and [ɗ],[12] respectively. Here are some examples:

(4) a. [mɔβɛ] 'a fruit'
b. [aβat] 'manioc bread'

(5) a. [iɗara] 'fly'
b. [ouɗɔ] 'big traditional house'

There is no such realization for the voiced velar stop /g/. In additon to this lenition process, there are restrictions on the occurrence of some of the Arara phonemes. For example, in lexical items other than proper names, there is lack of contrast between [t] and [ʧ] before the high front vowel [i]. In this environment only the affricate occurs:

(6) a. [ʧiʧi] 'sun'
b. [kɔtʃi] 'a fish'
c. [ʧiruka] 'coati'

This neutralization of contrast occurs because an alveolar stop always is realized as a palatal affricate before /i/, as can be seen in examples (7b) and (7c) below, where this lexical phonological process happens to reflexive and first person dual inclusive prefixes, respectively:

(7) a. /ɔt-pɛ-pɔ-lɯ/[13] → [ɔtpɛpɔlɯ] 's/he hit his/her own forehead'
Ref-forehead-hit-Rec
b. /ɔt-inɔ-lɯ/ → [ɔtʃinɔlɯ] 'they left each other'
Ref-leave-Rec
c. /kut-inɔ-lɯ/ → [kutʃinɔlɯ] 'we (dual) left him/her'
12Erg-leave-Rec

The process of affrication of a coronal stop also occurs (lexically and post-lexically) before a palatal approximant, as can be seen in (8b) and (9b) below:

(8) a. /karıamɯ-um/ → [karıamɯum] 'sheep'
deer-Aug

[12] The lenis form [ɗ] is an IPA notation for a quickly released [d], similar to an alveolar tap.

[13] Here there is object incorporation.

b. /ɔrɔt-um/ → [ɔrɔtʃum][14] ‘cultivated cashew’
cashew-Aug

(9) a. /pitɔt i-ɛmi-lɯ/ → [pitɔd iemilɯ] ‘I ate a (tropical) fruit’
fruit 1Erg-eat-Rec

b. /pitɔt jɛmi-lɯ/ → [pitɔtʃemilɯ] ‘s/he ate a (tropical) fruit’
fruit eat-Rec

However, there is contrast between [t] and [tʃ] before the vowel [i] in proper names:

(10) a. [titik][15] ‘proper name for a man’
b. [tʃipi] ‘proper name for a woman’

(11) a. [mohtiti][16] ‘proper name for a man’
b. [taʧi] ‘proper name for a man’

Before the vowel [i] the voiceless affricate [tʃ] is voiced into [ʤ] after nasal consonants, as in (12b) below.

(12) a. /i-la-tʃi/ → [ilatʃi] ‘his/her mouth’
3Abs-mouth-Poss

b. /i-mumɯ-tʃi/ → i-mum∅-tʃi[17] ‘his/her head’
3Abs-head-Poss [imumʤi]

Thus, within a word only the voiced affricate is found after a nasal:

(13) a. /kuŋtʃi/ → [kuŋʤi] ‘a bird’
b. /tɔŋtʃiɾi/ → [toŋʤiɾi] ‘a lizard’
c. /ɛmtʃin/ → [emʤin] ‘his daughter’

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[14] Here there is insertion of the palatal approximant [j], and coalescence of the preceding /t/ and /j/, resulting in the affricate [tʃ]. Insertion of [j] occurs within certain linguistic structures that involve relationships between a direct object + 3 person verb (statement only), genitive-nouns, and the noun stem -Aug when the first constituent ends in a consonant and the following one starts with a vowel (except for [i]): /ɔrɔt ɛnɛbɯlɯ/ → [ɔrɔtʃenebɯlɯ] ‘s/he brought cashew fruit’, /ɔrɔt awom/ → [ɔrɔtʃawom] ‘cashew fruit tail (shred)’, /wom-um/ → [womjum] ‘cultivated banana’. Compare these examples with: [ɔrɔd inebɯlɯ] ‘I brought cashew fruit’, [munbɔ awom] ‘rat tail’, and [munbɔum] ‘big rat’. Palatal glide insertion does not occur between subject-verb and moods other than declarative. Palatalization triggered by [j] is a post-lexical process. Compare: /ibɯt jɛ/ → [ibɯtʃe] ‘his mother-in-law’ with /ibɯt imɯ/ → [ibɯd imɯ] ‘his father-in-law’.

[15] This man is deceased.

[16] This man is deceased.

[17] Here there is a vowel deletion process, whereby across morpheme boundaries a vowel is deleted before a non-liquid consonant.

Actually, affricate voicing is part of a general process whereby only voiced obstuents occur after a nasal consonant, as illustrated in (14b) and (15b):

(14)	a.	/ɛnɛbɯ-ta/ bring-Dist	→	ɛnɛb∅-ta[18]	[enepta]	'bring it (from there)!'
	b.	/ɛnɛŋɯ-ta/ see-Dist	→	ɛnɛŋ∅-ta	[enenda]	'(go there to) see it!'
(15)	a.	/ɛnɛbɯ-kɔ/ bring-Imp	→	ɛnɛb∅-kɔ	[enepkɔ]	'bring it!'
	b.	/ɔmɔmɯ-kɔ/ enter-Imp	→	ɔmɔm∅-kɔ	[ɔmomgɔ]	'come in!'

Thus, within a word only voiced obstruents are found in this environment:

(16)	a.	[tomgem]	'an insect'
	b.	[panbak]	'ball'
	c.	[amdet][19]	'handle, strap, hank made of cotton or vegetal fiber'

As shown in examples (14a) and (15a) above, other voiced consonants do not cause the subsequent voiceless consonant to be realized as voiced. On the contrary, they are realized as voiceless themselves.

Although the alveolar stop [t] never occurs before [i] in the lexicon other than in proper names, its voiced counterpart [d] rarely can occur before this vowel: in the question word [wadite] 'how is it?', and in few derived words, where the vowel /e/ is raised to [i] before [a], in a dissimilation process. In this case, it must be noted that the voiced alveolar stop [d] is not realized as palatal before [i]. Examples are given in (17b) and (18b):

(17)	a.	/ɯ-guɾi-dɛ-lɯ/ 1-angry-Verb-Rec	→	[ɯguɾidɛlɯ]	'I got angry'
	b.	/ɔ-guɾi-dɛ-ane/ 2Abs-angry-Verb-Admon	→	[ɔguɾidiane]	'don't get mad!'

[18] For vowel deletion here and in example (15), see footnote 17.

[19] The Arara people from Cachoeira Seca village pronounce all these words with the corresponding voiceless stops.

(18) a. /i-mu-dɛ-lɯ/ → [imudelɯ] ‘it laid an egg’
3Abs-egg-Verb-Rec
b. /ni-mu-dɛ-a/ → [nimudia] ‘let it lay eggs’
3Abs-egg-Verb-Perm

The sequence [di] also occurs in proper names:

(19) a. [adidi] ‘proper name for a woman’
b. [mohtidi][20] ‘proper name for a man’

Other restrictions on sound occurrences can be found in utterance-initial position. Of the fourteen consonants, only nine occur in this position: the voiceless stops [p], [t] and [k], the affricate [ʧ], the bilabial and alveolar nasals [m] and [n], the lateral [l], and the glides [w] and [j]. The other five cannot be found in utterance-initial position: the voiced stops [b], [d] and [g], the dorsal nasal [ŋ], and the tap [ɾ]. Neither consonant group seems to form a natural class. Examples with consonants in utterance-initial position are given in (20):

(20) a. [peɾa] ‘a tropical fruit’
b. [tupɔ] ‘a gourd container’
c. [kutɔ] ‘a toad’
d. [ʧanɔ] ‘poison’
e. [mɯta] ‘a monkey’
f. [nunɔ] ‘moon’
g. [lukɯnden] ‘scorpion’
h. [wauɾi] ‘small fruit of a palm tree’
i. [jaguɾi] ‘agouti’

However, in terms of stops it is possible to see from affixation that each pair of voiceless and voiced stops occurs lexically in initial position in underlying forms (UF). Examples are given in (21) for voiceless and (22) for voiced, respectively:

(21) a. /kambɔt/ → [kambɔt] ‘firewood, fire’
b. /i-kambɔt-ɾɯ/ → [ikambɔɾɯ] ‘his/her firewood, fire’
3Abs-fire-Poss

(22) a. /bɯlɛptɛ/ → [pɯlepte] ‘knife’
b. /i-bɯlɛptɛ-n/ → [ibɯlepten] ‘his/her knife’
3Abs-knife-Poss

[20] This is different from [mohtiti] ‘proper name for a man’ in (11a).

As can be seen in (21b) above, the /k/ of the stem does not voice after the prefix [i-]; the phonetic representation *[igamboɾɯ] is unacceptable. Therefore, the variation between [p] and [b] in [pɯlepte] and [ibɯlepten] in (22a) is better explained as a devoicing process (utterance-initially) than a voicing process after a vowel across a morpheme boundary.

Stems starting with underlying voiceless consonants are extremely rare, like the example in (21) above. They form just a small group of stems: about twenty or less in the whole language. The most common situation is to have stems starting with voiced consonants which are realized as voiceless word-initially.

There are other kinds of examples showing a difference of behavior between underlying voiceless and voiced stops. One of them is that a voiceless alveolar stop (/t/) in a UF is realized as voiced after a nasal consonant, while in this same environment, an underlying voiced alveolar stop is deleted. This is possible to see comparing examples (23b) and (24b) below, where in the first there is voicing of a consonant and in the second deletion:

(23)	a.	/ak-ta/[21] eat-Dist	→ [akta]	'(go there and) eat it'
	b.	/ɛnɛn-ta/ see-Dist	→ [enenda]	'(go there and) see it'
(24)	a.	/i-ɛmi-da/ 1Erg-eat-Near	→ [iemida]	'I will eat it', or 'let me eat it (near me)'
	b.	/i-ɛnɛn-da/[22] 1Erg-see-Near	→ [ienena]	'I will see it' or 'let me see it (near me)'

Yet among the fourteen consonants, only six can be found in utterance-final position: the voiceless stops [p], [t] and [k] and the nasals [m], [n], and [ŋ]. The other eight cannot:

[21] The UF for "eat" is /agu/ and "see" in (b) is /eneŋɯ/. They were modified here for the sake of simplicity. The vowel deletion is referred to in footnote 17.

[22] See the previous footnote about the UF for "see".

the voiced stops [b], [d] and [g], the affricate [ʧ], the lateral [l], the tap [ɾ], and the glides [w] and [j]. Examples with consonants in utterance-final position are illustrated in (25):

(25) a. [kamap] 'a gourd container'
b. [wakat] 'alligator, cayman'
c. [kɔk] 'evening, night'
d. [ɔgum] 'wasp'
e. [ugon] 'man'
f. [manaŋ] 'a coconut bug'

In terms of UF's, the analysis developed to show contrast between the stops in initial position does not apply to the stops in final position because: (a) they agree in voicing with the following segment in a derived environment; or (b) they resyllabify to the onset position when the next segment is a vowel, as expected in any other language. In other words, in UF's stops are unspecified for voicing lexically in final position. This non-specification is represented by capital letters here and elsewhere.[23] Examples of voicing agreement between stops are shown in (26) and (27):

(26) a. /kamaB/ → [kamap] 'a gourd container'
b. /kamaB tɯt/ → [kamap tɯt] 'he wants a gourd container'
c. /kamaB lɔn/ → [kamab lon] 'gourd container itself'

(27) a. /kagaG/ → [kagak] 'a toucan bird'
b. /kagaG tɯt/ → [kagak tɯt] 'he wants a toucan bird'
c. /kagaG lɔn/ → [kagag lon] 'a toucan bird itself'

Examples of stops moving to the onset position when the next segment is a vowel are presented below:

(28) a. /ibɯD/ → [i.bɯt] 'his wife'
b. /ibɯD imɯ/ → [i.bɯ.di.mɯ̃ɪ] 'his father-in-law'

(29) a. /adaG/ → [a.dak] 'two, pair'
b. /adaG adaG/ → [a.da.ga.dak][24] 'four'

---

[23] Small upper case [ʙ̥] is used to represent a bilabial trill in this thesis. Therefore, it cannot be used to represent lack of contrast in voicing. Thus capital letters will be used: /B/ stands for bilabial, /D/ for alveolar, and /G/ for velar.

[24] The insertion of /j/ does not occur between a word for number and a verb (regarding /j/ insertion, see footnote 14).

c. /adaG amɯD/ → [a.da.ga.mɯt] ‘s/he (has) two pets’
d. /adaG enepkɔ/ → [a.da.ge.nep.kɔ] ‘bring two!’

On the other hand, all of the consonants may occur in onset position within an utterance. But in coda position within an utterance, only the stops (voiceless and voiced) and the nasals may occur, a total of nine consonants: [p], [b], [t], [d], [k], [g], [m], [n], and [ŋ]. However, the voiced stops occur only across word boundaries. The other five consonants never occur in coda position: [ʧ], [l], [ɾ], [w], and [j]. Some examples of consonants in coda position within an utterance are shown in (30):

(30) a. [tɯap̲.kɔ] ‘a toucan bird’
b. [kamap̲ taɾik̲.pe] ‘the gourd container is big’
c. [kamab̲ lon] ‘gourd container itself’
d. [ɔt̲.pidɔ] ‘an armadillo’
e. [wakad̲ wɔlɯ] ‘he killed an alligator’
f. [tuk̲.tɔ] ‘cultivated field’
g. [kagag̲ lon] ‘toucan bird itself’
h. [tom̲.gem] ‘insect’
i. [en̲.ban] ‘her/his food (fruit)’
j. [kuŋ̲.ʤi] ‘a bird’
k. [wag̲ wak] ‘a bird’

B. Vowels

As mentioned above, the Arara language has six vowels. A vowel chart is shown below with these phonemes:

Table 2: Vowels

	Front	Central	Back	
	Non-round	Non-round	Non-round	Round
High	i		ɯ	u
Mid	ɛ			ɔ
Low		a		

In order to confirm the vowel phonemes of the language, I show contrasts between them in Appendix 2 at the end of this thesis.

Phonetically, the high back vowels, /u/ and /ɯ/, tend to be pronounced as lax or slightly open. On the other hand, the mid front vowel /ɛ/ and the mid back vowel /ɔ/ tend

to be realized as more close before the close vowels /i/ and /u/. Examples with /ɛ/ being realized as [e] are given in (31) below:

(31) a. [muɾei] ‘chair, bench’
b. [eudɯ][25] ‘his ambush’

Examples with /ɔ/ being realized as [o] are given in (32) below:

(32) a. [ogoi][26] ‘snake’
b. [pou] ‘small peccary’

The front mid vowel /ɛ/ is often pronounced as [e] in closed syllables:

(33) a. [ɔet] ‘rubber tree, plastic’
b. [ɔɾek] ‘skin wound’
c. [pɯɾep] ‘instrument made out of vine put on feet to climb trees’

An Arara speaker can pronounce a word in several different ways, showing vowel fluctuation. This is illustrated below with the word for ‘beads’:

(34) a. [kuɾi]
b. [koɾi]
c. [kɔɾi]

However, there are restrictions on the occurrence of the vowels. Although all of them can begin a word or an utterance, with rare exceptions only /a/ and /ɛ/ begin stems that take prefixes (e.g. nouns that can be possessed, and verbs). Here are some examples with nouns with stems starting with vowels other than /a/ and /ɛ/:

(35) a. ug-iɛ-n ‘our (incl.) tooth’[27]
12Abs-tooth-Poss
b. ɯ-ɔdɔ ‘my owner’[28]
1Abs-owner
c. ɯ-u-n ‘my food’[29]
1Abs-food-Poss

Here are some examples with verbs:

[25] This is a trisyllabic word: [e.u.dɯ].

[26] This is also a trisyllabic word: [o.go.i].

[27] Only eight stems starting with /i/ were found.

[28] Only this stem was found.

[29] Only this stem was found. No stem was found starting with /ɯ/.

(36) a. i-ɔkpɛ-lɯ ‘I kept it’
1Erg-keep-Rec
b. i-ubi-tkɛ-lɯ ‘I looked for it’
1Erg-seek-Iter-Rec
c. in-iadu-lɯ[30] ‘I burned it’
1Erg-burn-Rec
d. i-ɯmdɯ-mɛ-lɯ ‘I put it in the water; I made it to dive’
1Erg-dive-Caus-Rec

At the same time, all of them undergo a nasalization process when they are in utterance-final position and are preceded by a nasal consonant. This may be seen as an intonational marking of an utterance boundary. Some examples are presented in (37) below:

(37) a. /abiana/ → [abianã] ‘a peccary’
b. /ponɛ/ → [pɔnẽ] ‘piranha’
c. /ɔɾɛmi/ → [ɔɾemĩ] ‘a fish’
d. /tɔɾɔmɔ/ → [tɔɾɔmɔ̃] ‘Brazil nut’
e. /imu/ → [imũ] ‘its egg’
f. /kaɾiamɯ/ → [kaɾiamɯ̃] ‘deer’
g. /mau/ → [mãũ] ‘cat’

When vowels are not in utterance-final position there is no nasalization. Some examples are presented in (38) below:

(38) a. [abiana βɔk] ‘on the peccary’
b. [pɔnɛ βɔk] ‘on the piranha’
c. [ɔɾɛmi βɔk] ‘on the fish’
d. [tɔɾɔmɔ βɔk] ‘on the Brazil nut’
e. [imu βɔk] ‘on the egg’
f. [kaɾiamɯ βɔk] ‘on the deer’
g. [mau βɔk] ‘on the cat’

Vowel nasalization occurs in proper names that end in a vowel, when said in an emphatic call. In this case, the nasalization spreads over all vowels of the word:[31]

[30] /i/ needs to be better analyzed, since it receives /in-/ as the person marking prefix, which comes before consonants, and not vowels.

[31] n this same kind of emphatic call, proper names that end in consonants have an extra unrounded high back vowel /ɯ/ after that consonant: /waŋgɔT/ → [waŋgɔdɯ] ‘proper name for a man’, /paŋ/ → [paŋɯ] ‘proper name for a boy’. Depending on the length of the calling, the epenthetic vowel can be lengthened.

(39) a. [ẽŋgõĩ] ‘proper name for a man’
b. [õtpã] ‘proper name for a woman’
c. [ʧĩmĩ] ‘proper name for a man’

3.1.2 Syllable Structure

Arara has the following syllable types: V, CV, VC, and CVC. Thus its maximal syllable template is CVC; there is no obligatory onset. All syllable types can occur word-initially and word-finally. Here are some examples with the V pattern, word-initially and word-finally, respectively:

(40) a. [ɯ.pɯ] ‘yam’
b. [ɔ.gum] ‘wasp’

(41) a. [mɯ.ɛ] ‘bag made out of vegetable fiber’
b. [tu.a] ‘a wild fruit’

Here are some examples with CV, word-initially and word-finally, respectively:

(42) a. [mɔ.ɛ] ‘a toad’
b. [ka.map] ‘a gourd container’

(43) a. [ɔna.kɔ] ‘a bird’
b. [ɯ.bɯ] ‘stone’

Here are some examples with VC, word-initially and word-finally, respectively:

(44) a. [ɔt.pidɔ] ‘an armadillo’
b. [ap.tenu] ‘wind’

(45) a. [ɛ.ɔk] ‘a beetle’
b. [ɔ.et] ‘rubber tree, plastic’

Here are some examples with CVC, word-initially and word-finally, respectively:

(46) a. [tuk.tɔ] ‘cultivated field’
b. [kɔt.kɔt] ‘a bird’

(47) a. [am.net] ‘his blood vessel, his vein’
b. [ka.map] ‘a gourd container’

3.1.3 Stress

In words pronounced in isolation, such as in a list, primary stress in Arara preferentially falls on the last syllable of the word. Some examples are given in (48) below:[32]

(48)	a.	[kɔ'kɔ]	'my uncle'
	b.	[wa'kat]	'alligator, cayman'
	c.	[tuk'tɔ]	'cultivated field'
	d.	[apte'nũ]	'wind'
	e.	[ɔtkɔi'mɔ̃]	'an armadillo'

However, there are some variations in stress. If a word ends in a sequence of two vowels (followed or not followed by a consonant) and the second vowel is [+high], the stress may alternatively switch to the previous vowel, resulting in a variation between a monosyllabic and a disyllabic realization of the same word. Some examples are given in (49) below:

		Two Syllables		One Syllable	
(49)	a.	[po'u]	~	['pou][33]	'small peccary'
	b.	[iɯ'i]	~	[i'ɯi][34]	'tree'
	c.	[mã'ũ]	~	['mãũ]	'cat'
	d.	[tɔ'uŋ]	~	['tɔuŋ]	'shotgun with a long barrel'
	e.	[a'ut]	~	['aut]	'his ribs'

Normally the pronunciations in the left column occur in careful speech; the others in normal speech. This variation is not present when the second vowel is [-high], as can be seen below:

(50)	a.	[mɯ'ɛ]	*['mɯɛ]	'bag made out of vegetable fiber'
	b.	[tu'a]	*['tua]	'a wild fruit'
	c.	[mɔ'ɛ]	*['mɔɛ]	'a toad'

Usually this variation is also absent in words containing three syllables:

---

[32] This is the only section of the thesis where stress is marked.

[33] If [u] were a consonant, [po'u] or ['pou] would receive [-gɔm] as plural and not [-ŋmɔ] as it does (see Section 3.2.7).

[34] The phonetic form [jei] 'wood, tree', starting with a consonant, was attested only in the ludling examples (see Appendix 3, example 4).

(51) a. [takɯ'i] *[ta'kɯi] ‘manioc flour’
b. [ogo'i] *[o'goi] ‘snake’

But there are some exceptions. In these cases, the consonant of the penultimate syllable must be a liquid: /ɾ/ or /l/. Some examples are given in (52) and (53) below:

(52) a. [muɾe'i] ~ [mu'ɾei] ‘chair, bench’
b. [kaɾe'i] ~ [ka'ɾei] ‘non Indian’

(53) a. [lala'u] ~ [la'lau] ‘proper name for a woman’
b. [ʧila'u] ~ [ʧi'lau] ‘proper name for a woman’

Since stress on words pronounced in isolation, such as in a list, is very predictable, in the rest of my phonetic transcriptions I will not mark it. However, it is worth noting that within a sentence the stress can change from its final position within the word to a different syllable. This can be seen in words such as [iʧigu'ɾu] ‘his urine’ and [u'ɾɔ] ‘I’, which in isolation are spoken with stress on the last syllable, but within a sentence pronounced with stress on the third and second syllable (from right to left), respectively.

(54) [i"ʧigu'ɾu doŋ 'uːɾɔ][35] ‘I am going to urinate’
/i-ʧigu-ɾu doŋ uɾɔ/
3Abs-urine-Poss be I

3.1.4 Some Common Phonological Processes

In this section I will present one phonological constraint and some of the common phonological processes that occur in the Arara language.

Obligatory Contour Principle

The Obligatory Contour Principle (OCP) “prohibits consecutive or adjacent identical segments” (Goldsmith 1990:309). When identical segments are adjacent the OCP is violated. In Arara UF’s, it is possible to find sequences of segments with similar points of articulation, consonants or vowels, violating the OPC. When this happens, one of them is deleted: either the first or the second segment. It is not yet completely understood what

[35] This sentence was collected in 1988, from a young man during an Arara festival. It was recorded with a Sony tape recorder. An Arara vowel can be lengthened in an emphatic linguistic environment.

triggers the direction of deletion. Examples involving regressive deletion of consonants are shown in (55b), (56b), and (57c):

(55)	a.	/ɛɾuB/[36]	→	[ɛɾup]	'hurry'
	b.	/ɛɾuB mɔmuɾu/ hurry PN	→	ɛɾu∅ mɔmuɾu [ɛɾu momuɾu]	'hurry, Momuru!'
(56)	a.	/i-bɔD put/ 3Abs-lip hair	→	[ibɔt put]	'his beard, his moustache'
	b.	/i-bɔD-ɾɯ/ 3Abs-lip-Poss	→	i-bɔ∅-ɾɯ [ibɔɾɯ]	'his/her lips'
(57)	a.	/wan/	→	[wan]	'honey'
	b.	/ɛpi/	→	[epi]	'his/her skin, its bark, leather'
	c.	/wan ɛpi/ honey bark	→	wan j-ɛpi[37] wa∅ jɛpi [wajepi]	'beeswax'

Examples of progressive consonant deletion, which occurs only in suffixes, are shown in (58b) and (59b) below:

(58)	a.	abɛ-dam ebb-season	'season of ebbing (water stream), dry season'
	b.	inmɛl-am fill-season	'season of filling (water stream), rainy season'
(59)	a.	ɛŋu-ɾu eye-Poss	'her/his eye'
	b.	i-dagin-u 3Abs-whistle-Poss	'her/his whistle'

Examples of regressive vowel deletion are shown in (60b) and (61b):

(60)	a.	uɾɔ	'I'
	b.	malon ur ɛndɔ enough I here	'I am going to stay here'

[36] It must be remembered that stops lose their voicing contrast in utterance-final position: in this position, only voiceless stops occur. Thus, a capital symbol in the underlying representation stands for an archiphoneme that points to neutralization of contrast (see footnote 23).

[37] Here there is a feeding relationship: a palatal approximant is inserted across word boundaries between a C and the following V (CjV), and the preceding coronal C is deleted by virtue of the OCP violation (∅jV).

(61) a. aŋna ‘mortar’
b. aŋn ɛbu-ɾu ‘pestle’
mortar handle-Poss

An example of progressive vowel deletion is shown in (62b):

(62) a. wauɾi aɾɯ ‘fruit tree’s leaf’
fruit leaf
b. waŋwa ɾɯ ‘fruit tree’s leaf’
tree leaf

Progressive Vowel Deletion

A vowel is deleted after another vowel across a morpheme boundary. This deletion applies only in certain suffixes: /-ɛnŋɛ/ ‘plural in postpositions’, /-ɛbaɾa/ ‘negation’, and /-ɯpɛ/ ‘there is’. This phonological process cannot be insertion since it would be necessary to propose that there is insertion of different vowels, such as [e] vs. [ɯ].

Examples with the ‘plural’ suffix in postpositions /-ɛnŋɛ/:

(63) a. /i-bɯdɛg-ɛnŋɛ/ → [ibɯdegenŋɛ] ‘he/she is like them’
3Abs-similar-Pl
b. /ug-wɯna-ɛnŋɛ/ → ug-wɯna-∅nŋɛ ‘for us’
12Abs-for-Pl [ugwɯnanŋɛ]

Examples with the ‘negative’ suffix /-ɛbaɾa/:

(64) a. /mɔndɔn-ɛbaɾa/ → [mondɔnebaɾa] ‘s/he, it is not there’
there-Neg
b. /tɔ-nɛn-dɛ-ɛbaɾa/ → tɔ-nɛn-dɛ-∅baɾa ‘it is not possible to see it’
T-see-Nmlz-Neg [tɔnendebaɾa]

Examples with the ‘existential’ suffix /-ɯpɛ/:

(65) a. /mulik-ɯpɛ/ → [muligɯpe] ‘there is an ani bird’
ani-there.is
b. /pumiɛ-ɯpɛ/ → pumiɛ-∅pe ‘there is a woman’
woman-there.is [pumiepe][38]

[38] This phonetic representation shows that the deletion process being described here does not apply cyclically; otherwise the phonetic form would be *[pumiep]. But that surface form means ‘she is a woman’.

Nasalization of Stops

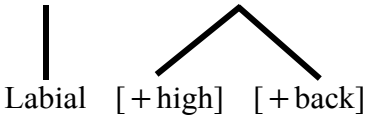
A stop consonant is realized as a nasal before a nasal consonant, as can be seen in (66b), (67b), and (68b) below:

(66)	a.	/wambiT/[39]	→ [wambit]	'vulture'
	b.	/wambiT muɾɛn/ vulture baby	→ [wambin muɾen]	'vulture's baby'
(67)	a.	/w-ibɯ-lɯ/ 1Erg-bathe-Rec	→ [wibɯlɯ]	'I took a bath (today)'
	b.	/w-ibɯ-naŋɯɾɯ/ 1Erg-bathe-Prog	→ w-ib∅-naŋɯɾɯ[40] [wimnaŋɯɾɯ]	'I am taking a bath (in the river)'
(68)	a.	/ug-aɾɔ/ 12Abs-lung	→ [ugaɾɔ]	'our (incl.) lung'
	b.	/ug-mum-ʧi/ 12Abs-head-Poss	→ [uŋmumʤi]	'our (incl.) head'

Vowel Deletion in CV Syllables

A high back vowel, [u] or [ɯ], is deleted after another vowel across a morpheme boundary. The vowels must have an intervening labial consonant. The following diagram represents this vowel deletion process.

(69) V + C V̆ → ∅



Only a few nouns with obligatory possession undergo this deletion. The phonological process described here cannot be insertion since it would be necessary to propose that there is insertion of different vowels, such as [u] or [ɯ]. As shown in the above chart, the vowels that are sensitive to deletion after a prefix are marked with a diacritic to mark this sensitivity. This breve mark over the vowel is an ad hoc device, just to show that they

[39] See footnote 23 for an explanation of capital letters.

[40] Across morphemes a vowel is deleted in verb stem-final position before a non-liquid consonant (see footnote 17); stop sequences then are realized as voiceless: /bt/ → [pt]. Even when both stops are underlyingly voiced they are realized as voiceless: /ug-banan/ → [ukpanan] 'our (incl.) ear'.

have a different behavior in relation to other vowels that do not undergo deletion in the same environment. Examples of noun stems with vowels sensitive to deletion are: /mŭnu/ ‘body, flesh’, /mŭdabɯri/ ‘food’, /mŭbɛ/ ‘shoulder blade, scapula’, /bŭʧi-/ ‘leg’, etc. As already stated, all noun stems with a vowel sensitive to deletion begin with a labial consonant.

(70) a. /mɔukɔ bŭʧi-n/ → [moukɔ bɯʧin] ‘Mouko’s leg’
PN leg-Poss

b. /i-bŭʧi-n/ → [ipʧin] ‘his leg’
3Abs-leg-Poss

(71) a. /taʧi mŭbɯa-ʧi/ → [taʧi mubɯaʧi] ‘Tatji’s arm’
PN arm-Poss

b. /i-mŭbɯa-ʧi/ → [imbɯaʧi] ‘his arm’
3Abs-arm-Poss

Noun stems with vowels not sensitive to deletion after a prefix have no diacritic: /bana/ ‘ear’, /mɔwa/ ‘back’, /duɾu/ ‘central part of the body’, /bɛba/ ‘forehead’, /bia/ ‘cheek’, etc.

Regressive Vowel Harmony

When the back round vowel /u/ occurs before a tap preceding the mid vowel /ɛ/, the mid vowel spreads its features to the back vowel across morpheme boundaries. Here are some examples:

(72) a. /i-mɯŋu-ɾu/ → [imɯŋuru] ‘his/her blood’
3Abs-blood-Poss

b. /tɯ-mɯŋu-ɾɛ/ → [tɯmɯŋɛɾɛ] ‘s/he is bleeding’
T-blood-Adjr

However, if the preceding vowel is not an /u/, then /ɛ/ does not spread its features.

(73) a. /abo-n/ → [abɔn] ‘its wing’
wing-Poss

b. /t-abo-ɾɛ/ → [tabɔɾɛ] ‘it is with open wings’
T-wing-Adjr

3.2 Brief Overview of Arara Grammar

3.2.1 Morphological Typology

In relation to the synthetic index (Comrie 1989:46; Whaley 1997:128-9), the Arara language is a synthetic language since it utilizes various prefixes and suffixes, as illustrated in (74).[41]

(74) tɯ-wɔ-dɯ-k ɔmɔɾɔ-ŋmɔ ganan
DO-kill-Pl-Imp you-Pl at.least
'kill it!, at least you all (do it)'[42]

No statistical research was done, however the Arara language seems to uniformly share fusional and agglutinative characteristics, according to the terms of the fusion index (Comrie 1989:46; Whaley 1997:133). Example (75b) below shows fusion occurring between the second person /ɔ-/ and the vowel /ɛ/ in the stem, resulting in [i].

(75) a. /ug-ɛɾɛ-n/ [ugɛɾen] 'our (incl.) liver'
12-liver-Poss
b. /ɔ-ɛɾɛ-n/ [iɾen][43] 'your liver'
2-liver-n

Examples in (76) show agglutinative characteristics in Arara. The majority of these morphemes can be easily segmented.

(76) a. kuʧ-ip-ta-ndɯ-n
12Erg-bathe-Dist-Pl-Hort
'let's (all) take a bath' (elicited)
b. k-ɔd-ɛmia-guɾugɛ-da
1Erg-Refl-hand-wash-Near
'I am going to wash my hand (in a near place)' (elicited)

In Arara there are three orders of prefixes and seven of suffixes. Sentence (76b) above is an example of a sequence of three prefixes: person-Refl-Noun. Here is an example of five suffixes:

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[41] The transcription here is phonological, not phonetic.

[42] Text *Abiana wyna tjimna kundomba* (We went hunting pecarries). Author: Akitu Arara. Recorded and transcribed by Isaac and Shirley Souza. May 1, 2002.

[43] [ɛɾɛn] is 'her/his liver'; [iɛɾen] is 'my liver'.

(77) i-n-ɛŋua-nɔp-tɔn-tadamɯ-lɯ-ŋmɔ
3Abs-O.Nom-know-Caus-Verb-Iter-Rec-Pl
'the ones that are to be taught by him' (elicited)

The following diagram shows the order in which the different morphemes occur in verbs:

(78)

Erg	Abs Ref	Incorp	**Stem**	Caus	Verb	Iter	Tense	Aspect	Indic Imp	Pl

3.2.2 Ergative Type

In terms of person cross-referencing on the verb (Comrie 1989:111, 126), Arara displays an ergative-absolutive pattern. The prefix of the subject of an intransitive clause has the same form as the prefix of the direct object of a transitive clause. The prefix of the subject of a transitive clause has a different form. Some examples are given below (all of them elicited):

(79) a. ɯ-wɯngɯ-lɯ
1Abs-sleep-Rec
'I slept'
b. ∅-ɯ-mɔŋɔgu-lɯ
3Erg-1Abs-wait-Rec
'he/she waited for me'
c. in-∅-mɔŋɔgu-lɯ
1Erg-3Abs-wait-Rec
'I waited for him/her'

In the entire Arara language, there are nine intransitive verbs that form clauses with an ergative subject prefix, similar to the ones that occur in transitive clauses. In terms of first person, five of them occur with the allomorph [w-] and four with the allomorph [k-]. This last allomorph occurs only before verb stem starting with the vowel /ɔ/; the allomorph /w-/ occurs before verb stems starting with the other vowels, as can be seen in (80) below.

(80) a. w-ibɯ-lɯ
1Erg-bathe-Rec
'I took a bath'

b. k-ɔɾigu-lɯ
1Erg-dance-Rec
'I danced'[44]

When a language has intransitive verbs that sometimes perform the function of an active subject and sometimes perform the function of a non-active subject, it can be said that this language has split intransitivity. Since in Arara there are so few intransitive verbs with ergative (active) prefixes and the vast majority has abslotutive (non-active) prefixes, it cannot be classified as having split intransitivity.

3.2.3 Word Order

For transitive clauses, Arara has the basic word order object-verb-subject (OVS). Examples are given below:

O V S
(81) ɔɾɛmi abot-tadamɯ-lɯ kɔkɔ
fish.(sp.) catch-Iter-Rec uncle
'uncle caught several "oremi" fish'

O V S
(82) ...wɔtɔmɔ aut j-ak-takpɯ-lɯ waga...
tapir rib Relr-eat-finish-Rec PN
'...Waga finished eating the tapir rib...'

For intransitive clauses, the word order is primarily SV.

S V
(83) [mutɛ kun-ɛp-pa][45] i-ɛʧit poda-aktʃi
PN Rem-arrive-Ind 1Abs-house inside-Dir
'Mute came to my house (remote)'

S V
(84) paɾu akɯndɛ-lɯ
water dry-Rec
'the water dried up (in the small creek)'

[44] The other verbs that follow these patterns are: [webɯlɯ] 'I arrived', [wɯdɔlɯ] 'I went out', [wibeŋɯrɯ] 'I fled', [witʃilɯ] 'I layed down', [kɔɾamelɯ] 'I missed the target', [kɔɾapɔtadamɯlɯ] 'I walked around', and [kɔngulɯ] 'I climbed up'.

[45] The use of square brackets within a sentence is only to mark syntactic constituents.

OVS word order is quite rare among the languages of the world. For example, in one database of 1228 different languages, only nine are reported to have this word order, and six of them are from South America (Dryer 2008:331).

In stative clauses, Arara has the word order subject-adjectival predicate (S-AP).

	S		AP
(85)	marag	wɛt	pɯgiɾimam-bɛ[46]
	cockroach	feces	dirt-Pred

'the cockroach feces are dirty'

3.2.4 Noun Phrases

OV languages usually have the order adjective-noun (Comrie 1989:95). However, in Arara, a noun phrase has the adjective after its head:

	N	Adj	
(86)	ugɔn	ka-kɔ-mnɯ	i-ɾumbɔ-lɯ
	man	high-over-Neg	3Abs-die-Rec

'the short man died (today)' (elicited)

	N	Adj		
(87)	[wɔŋɔ	taɾik-kɔm]	bɯdɛk-ɛbaɾa	tawɛ, tɯ-mnɛ-bara
	game	big-Pl	like.be-Neg	monkey.(sp) T-flesh-Neg

'monkey is not like big game meat; it does not have a big body'

On the other hand, the number precedes the noun:

	Num	N	
(88)	[ananɛ	nunɔ]	w-ɛp-ta-nbɔm
	one	moon	1Erg-come-Dist-later

'I will come back within one month (from the city to the village)'

	Num	N	Adj	
(89)	[adak	ɔbinɛ	apagɯrɯdɛm]	jɛŋnabɯ-lɯ ɔbɛtpambɯn
	two	metal	flat	put-Rec buy.few

's/he put two worthless coins (in the basket)'

The head may be detached from the number and placed at the end of the clause:

[46] Text: *Marak*. Author: Akitu Arara. Text collected and transcribed by Isaac and Shirley Souza, Altamira, April 23, 2004. The word [marak] seems to be borrowed from the Portuguese *barata* 'cockroach'.

Num N
(90) [adak] n-itʃ-a [i-amɯ-t]
two 3Abs-Aux-Perm 1Abs-pet-Poss
'let me get two pets (from these ones)'

Or the number may be detached from the head to the end of the clause:

N Num
(91) [maɾapa] abi-lɯ papa [adak]
paddle make-Rec father two
'my father made two paddles'

3.2.5 Relational Phrases

Typological studies show that OV languages usually have postpositions instead of prepositions (Comrie 1989:95). The Arara language follows this general typological tendency, as may be seen in the following examples:

(92) walɔ muɾɛn i-abɔt-taŋ-dɛ [ɔɾɔŋ bɔk]
hawk.(sp.) small 1Sg.Erg-catch-Uni-Perf ground on
'I caught a small hawk on the ground'

(93) t-udu-k [kaɾɛi wɯna]
DO-give-Imp non.Indian to
'give it to the non-Indian!'

3.2.6 Tense, Aspect and Mood

The Arara language inflects verbs for tense, aspect and mood. Tense is marked by [-lɯ] 'recent past', [-nɛ] ~ [-n] 'remote past', [-tʃi] ~ [-t] 'present', [-tɔmɛ] 'future', [-taŋ] ~ [-aŋ] 'universal tense'.[47] Below are examples of each tense:

(94) a. w-ibɯ-lɯ
1Erg-bathe-Rec
'I took a bath (today)'
b. w-im-nɛ-ba
1Erg-bathe-Rem-Ind
'I took a bath (yesterday)'
c. w-ip-tʃi
1Erg-bathe-Pres
'I bathe'

[47] /-(t)aŋ/ has been glossed as universal tense (Uni) because: (a) in indicative clauses it does not point to a specific time, but only functions as a support to the aspect markers for perfective and imperfective; (b) in interrogative clauses it seems to function as a non-past tense.

d. pawi i-ak-tɔmɛ kɔgɔlɔne
curassow.(sp.) 1Erg-eat-Fut tomorrow
'tomorrow I will eat the curassow'
e. w-ip-taŋ-dɛ-ba
1Erg-bathe-Uni-Perf-Ind
'I already took a bath'

Aspect is marked by [-dɛ] 'perfective', [-gɯ] 'imperfective', and [-naŋɯrɯ] 'progressive'. Below are examples of each aspect:

(95) a. w-ip-taŋ-dɛ-ba
1Erg-bathe-Uni-Perf-Ind
'I already took a bath'
b. w-ip-taŋ-gɯ-ba
1Erg-bathe-Uni-Imperf-Ind
'I was taking a bath'
c. w-im-naŋɯrɯ
1Erg-bathe-Prog
'I am taking a bath'

Mood is marked by [-kɔ] ~ [-k] 'imperative', [-nɛ] ~ [-n] 'hortatory', and [-ba] 'affirmative'.[48] Here are examples with imperative and hortatory mood:

(96) a. ip-kɔ
bathe-Imp
'take a bath!'
b. kuʧ-ip-tɯ-n
12Erg-bathe-Pl-Hort
'let's (all) take a bath!'

Here are examples with the affirmative mood:

(97) a. w-ip-taŋ-dɛ-ba
1Erg-bathe-Uni-Perf-Aff
'I took a bath'
b. w-im-nɛ-ba
1Erg-bathe-Rem-Aff
'I took a bath (yesterday)'

However, /-ba/ never occurs with recent past:

(98) *w-ibɯ-lɯ-ba
1Erg-bathe-Rec-Aff
'I took a bath'

[48] Interrogative mood (Yes-No Questions) is formed by the use of the particle [ga] ~ [ka], as in [magu ga] 'did you eat?', and [mip ka] 'did you take a bath?'.

3.2.7 Plural Forms

There are thirteen different allomorphs for showing plurality in Arara. They can be classified into eight groups, depending on the grammatical form they occur in. In the clusters below with more than one member, the allomorphs depend on the phonological environment. In the verbs, the plural forms refer mainly to the subject.

(99)	a.	[-ŋgmɔ] ~ [-kɔm ~ -gɔm][49]	nouns, proper nouns, adjectives, subject in verbs in the indicative mood, verb suffix of purpose
	b.	[-tɔm ~ -dɔm]	subject in verbs in the interrogative mood and in verbs in future tense
	c.	[-ɛnŋɛ ~ -nŋɛ]	object of post-positions, subject of verbs in conditional sentence, subject in verbs in negative mood, verbal stems without markers for mood/aspect/time, adverbs of intensity
	d.	[-tɯ ~ -dɯ]	subjects in verbs in imperative and hortatory mood, subjects in verbs with the sufix for 'later (euphemic imperative)', subject in verbs with the sufix for 'always'
	e.	[-ptɯ]	subject in verbs with the suffix for 'admonition'
	f.	[-ndɯ]	subject in verbs with the suffix for 'distal'
	g.	[-am]	possessor of obligatorily possessed nouns without the possessor marker, possessor of obligatorily possessed nouns with the nominalizer of past, a question word
	h.	[-bu]	object of post-position for 'companion'

Proper names can have plural suffixes, as other nouns do:

(100)	a.	[taiŋmɔ]	'Tai and others'
	b.	[pɯtɔtkom]	'Pytot and others'
	c.	[mutemgom]	'Mutem and others'

There is no agreement in number between a verb and any of its overt arguments, or between a head and its dependent. Examples of absence of agreement at the sentence level are given below in (101) and (102):

(101)	a.	karei	ɯdɔ-lɯ-ŋmɔ	'the non-Indians went out'
		non.Indian	go-Rec-Pl	
	b.	karɛi-ŋmɔ	ɯdɔ-lɯ	'the non-Indians went out'
		non.Indian-Pl	go-Rec	

[49] The suffix [-ŋmɔ] occurs after a vowel, and the suffixes [-kom] and [-gom] after a consonant; but [-kom] after a voiceless consonant and [-gom] after a voiced consonant.

c. *karɛi-ŋmɔ ɯdɔ-lɯ-ŋmɔ ‘the non-Indians went out’
non.Indian-PL go-Rec-Pl

(102) a. pumiɛ kurɛ-ŋmɔ-p ‘the women are beautiful’
woman good-Pl-Adjr

b. pumiɛ-ŋmo kurɛ-p ‘the women are beautiful’
woman-Pl good-Adjr

c. *pumiɛ-ŋmɔ kurɛ-ŋmɔ-p ‘the women are beautiful’
woman-Pl good-Pl-Adjr

An example at the phrase level is given below:

(103) a. wɔŋɔ tarik-kɔm ‘the big game meats’
game big-Pl

b. *wɔŋɔ-ŋmɔ tarik-kɔm ‘the big game meats’
game-Pl big-Pl

CHAPTER 4

LUDLING DATA

In this chapter I present the Arara ludlings that I collected from some elderly Arara people living in the village named Laranjal. In terms of the ludlings, young people are not, unfortunately, learning them any longer and the elderly Arara, due to lack of practice, are forgetting them. As a dying phenomenon, it is not unusual for the ludling speakers to have trouble with some or many of these unique forms. Indeed, the first time I heard these language games was in about 2001, and it was only by chance. One evening I was sitting at a table with some young Arara men and I spoke to one of them in the same way as I had been speaking to his little daughter. Children learning the Arara language use [l] instead of [ɾ]: [jɔlu] instead [jɔɾu] 'tortoise'. So I replied to one of his questions by saying [ibala] instead of [ibaɾa] 'no, nothing', pretending I was a little boy. Laughing and widening his eyes he replied to me with surprise: "I am not a monkey for you to talk to me like this!" Then I found out that I was going to learn something new about the Arara language. I grabbed my notebook and said: "What? Is it not only children who speak this way?" He explained: "We only speak like that to monkeys. For example, instead of saying [amuɾu] we say [amulu]" (this word denotes a kind of alcoholic drink made out of chewed roots, mainly cassava). But he did not know any more examples. So he pointed out some people who would know more of these. The next day I started going to those people and, in several sessions, I discovered thirteen different ludlings that they use not only to talk to monkeys, but to other pets as well, one for each kind of animal that they

are talking to.[50] As can be seen, the effect of my joke was the opposite of what I had intended. Instead of the man interpreting my utterance as if I were a little child talking, he interpreted it as if had been talking to a pet.

4.1 Meaning and Purpose of the Word Games

Ludlings are common among the languages of the world, as pointed out by Bagemihl (1996:319). In the literature, according to Sherzer (1982), ludlings have different labels, such as "disguised speech", "linguistic games", "ludling," "pig latins", "secret codes", "secret languages, "speech disguise", and other names. Botne & Davis (2000) use the term "language game". Sherzer prefers the terminology "play language". In this thesis I use some of these terms, with preference for the label *ludling*, from Latin *ludus* 'game' and *lingua* 'language', as described by Laycock (1969:14). Also, the word *ludlingant,* derived from *ludling,* will be used in this thesis. This word is defined by Sanders (2000:31) as the morpheme "realized as a substring of the output that is sensitive to constraints that reference it." His definition includes only the reversal ludling morpheme, but here I use the term *ludlingant* for any morpheme used by the Arara people in their ludlings.

Laycock (1972) says that a ludling is a transformation of an ordinary language, changing the format but not the content of the original message, for purposes of concealment or comic effect (Frazier & Gil 2007). In this sense, Sherzer (1982:175) states that play languages imply the creation of new linguistic codes derived from the base language. He also says that play languages are linguistic forms that at any level are purposely manipulated. In this sense, the Arara language has ludlings, since the Arara

[50] Child speech is not included here because, although having some small similarities with the *ludlings*, it also has lots of differences. For example, one main strategy to talk to children is to shorten consonants and words ([tekɔ] instead [ɔdepkɔ] 'come here'), something out of the ludlings' scope.

elders purposely manipulate the base language, changing the format but not the content of it, creating new linguistic codes with a certain purpose. Sherzer says that strictly speaking, the ludlings are not games, since they do not involve competition or winners, being primarily used for fun, although this does not mean that they need to be necessarily humorous (Sherzer 1982:175). Indeed, in Arara the elders do not have a humorous purpose when they use them.

Historically, purpose was crucial for ludling studies. Bagemihl (1996:699) says that traditional definitions of language games were based mainly on their sociolinguistic function. According to him they always have restricted sociolinguistic functions. Along this line, Sherzer (1982) specifies some common functions of play languages: concealment or secret, language learning (in Thai), pure fun or for play's sake. He also says that some play languages are used in ritual contexts. In relation to the Arara language, the ludlings fulfill a very restricted sociolinguistic purpose; they are used to "talk" to the Araras' pets as an expression of friendship. They can use the ludlings any time they approach their pets. On the other hand, in Arara there is no ritual context in which the ludlings are used.

Although being important, the purpose approach was not enough to explain the ludlings in the languages around the world. Thus Laycock[51] shifted this approach to one based on the ludlings' formal properties themselves. From this perspective, according to Bagemihl (1996:697) there are some factors intrinsic to ludling data: (a) they are quite unlike ordinary language operations and (b) they are relatively restricted with respect to their sociolinguistic function. In other words, the data have common operations such as

[51] This happened in: Laycock, Donald. 1972. "Towards a typology of ludlings, or play-languages." *Linguistic Communications: Working Papers of the Linguistic Society of Australia* 6:61-113 (see Bagemihl 1996). I was not able to find the Laycock article, so it is not part of my bibliography.

reversal, replacement, etc., that are not common to the normal language. Also, while the normal language can be used for a great variety of sociolinguistic functions, ludlings have very restricted social functions. Thus, in defining ludlings, Bagemihl (1996:699) includes the following criteria:

(a) ludling morphological processes may involve affixing, templatic structure, reversal, and replacement;

(b) their affixes are limited to one or at most a handful of lexical items;

(c) their morphology is semantically empty.

Criterion (b) does not describe the Arara ludlings very well, since these are quite productive. However, criteria (a) and (c) do. Commenting on criterion (a) above, Bagemihl (pp. 699-700) states that affixing is the simplest process in forming ludlings, and it involves attachment of a ludling affix to a non-ludling word. The ludling affix may have a vowel slot that is unspecified for its quality; but also it may have a vowel specified for its quality. The infix /-gV-/ is an example of a ludling affix containing an unspecified vowel. This infix can be added to an Arara base word such as /abat/ 'manioc bread', resulting in the ludling form /abagat/. An example of an affix containing specified vowels in Arara is the prefix /idi-/, which can be added to the same Arara base word /abat/, resulting in the ludling form /idibat/. Bagemihl also states that in templatic processes nasality may be mapped onto the template. This is attested in Arara, where the feature of nasalization can pertain to a word, a phrase, a sentence or a whole discourse. This can be seen in the Arara base word /tawɛ/ 'capuchin monkey', which turns to /tãwɛ̃/ after the addition of the ludling's nasal feature. Yet in reference to (a) above, Bagemihl says that all or most of the vowels in a non-ludling utterance are replaced by one or two segments in the ludling form. In Arara the vowels in a base word can be replaced by the vowel [æ], or by lower and/or more fronted vowels in relation to the vowels of the base word, as can

be seen in /tawɛ/ changing to [tæwæ]. All of these phenomena will be presented in more detail in Section 4.2 below.

Commenting on (c) above, Bagemihl (1996:700) states that ludling morphology is semantically empty because it is used only to classify the speaker or the hearer as belonging to a particular category of individuals. For example, a person uses Pig Latin to address someone who belongs to a certain circle of friendship. In the Arara culture, a person uses the appropriate ludling to address specific classes of animals. Thus, the infix /-gV-/ is used to talk to capuchin monkeys; the prefix /idi-/ to talk to titi monkeys; the infix /-pt-/ to talk to squirrel monkeys; and nasalization is used to talk to howler monkeys.

The Arara people love their pets. Therefore, pets are very important in the Arara culture. Arara myths reveal that some animals were their ancestors, mainly the monkeys. Sometimes the Arara people use the ludlings' structures for naming their pets, according to each animal species. Thus they can give the name /muni-gV/ → [munigi] 'brother' to a capuchin monkey. Usually the pets get names like any human being and the process of naming them is the same they use to name people. Then a person can get a proper name like [tɯptʃigɔriwɯ] 'crooked shinned'; a capuchin monkey can get a proper name such as [tɯptapa] 'the one who has a flat hand'.[52] Right after the Arara contact with FUNAI, it was possible to see Arara mothers feeding from their own breasts not just their new babies but also own baby monkeys that their husbands had brought from the forest. For other pets, they offered their milk in a leaf. Thus, in this sense, it is not a surprise that the Arara people have different language games when playing with their pets. The surprise is in the high number of ludlings they use to "talk" to their pets. Just for a matter of

[52] See Souza (in progress).

statistical comparison, Javanese (the language I found with the most play languages) presents only seven different ludlings (Sherzer 1982:183-186).[53] Arara has almost twice this many.

In spite of the differences between a ludling and the base language in which it originates, an actual development in ludling analysis is the recognition that a ludling also involves linguistic processes of the ordinary language (Bagemihl, p. 701). In this sense, Sherzer (1982) states that there are similarities and differences among the linguistic structures of ludlings and ordinary languages. Haas (1967) provides a taxonomy of mechanisms or rules involved in play languages that are common to the languages of the world, namely: addition, subtraction, reversal, and substitution. The phonological typology of language games shows that the two most common types of games are syllable transpositions and phoneme insertions in one or more locations in a word (Botne & Davis 2000). On the other hand, reversal does not exist cross-linguistically. The ludlings in Arara fit in this typology, since they are built up mainly through the insertion of one ludling per word. It is noteworthy that what belongs to ordinary languages is more common in the ludlings and what does not belong to ordinary languages is rarer among the ludlings. If syllable reversal is not exploited in common languages, it will not be widely used in the ludlings. On the other hand, if addition is common among the languages of the world, it will be used in ludlings. Indeed, addition is the main process by which Arara speakers form their ludlings (eleven, out of thirteen).

Bagemihl (p. 711) states that "ludlings are an integral part of the human linguistic capacity and as such, an integral part of linguistic theory". In other words, linguistic

[53] I did not do an exhaustive search on this.

theory has the necessary tools to analyze the ludlings around the world. I illustrate this using the thirteen different ludlings I found in the Arara society.

4.2 Presentation of Data

Some Arara elders from Laranjal village use ludlings to address different pets. These ludlings occur mainly with nominal words, like nouns. But they are also attested in verbs, phrases, and sentences, although only one man knows all thirteen ludlings and can use them in sentences. They are built through the addition of affixes to the base words of the Arara language. To form a ludling in Arara the attachment of only one affix is necessary. This affix can be a prefix, a suffix, an infix, or a suprafix. Among these, only the first two affixes occur in the normal Arara language. The last two are specific to the ludlings. These ludlings include vowel nasalization (V → Ṽ), vowel delition (V-V → V∅), and changes in consonant manner of articulation (/ɾ/ → /l/), tap deletion ((/ɾ/ → ∅), consonant replacement (C(C) → pt), changes in vowel quality (V → æ), etc. These changes will be exemplified and discussed below. For now I present the pets and the ludlingants relating to them:

Table 3: Pets' Names and Ludlingants

	English	**Arara**	**Ludlingant**
a.	capuchin monkey	/tawɛ/	infix /-gV-/
b.	titi monkey	/kuʧamit/	prefix /idi-/
c.	large birds: chicken, duck, Brazilian merganser, guan and curassow	/ʧaɾina/[54], /mak kɛni/, /jaɾambi/, /wɔgaɾaum/, /pawi/	prefix /wi-/
d.	trumpeter, woodpecker	/waɾakina/, /iɛbɛɾɛbɯɾɯ/	prefix /pɔ-/
e.	coati	/ʧiɾuka/	prefix /nɯ-/
f.	agouti	/jaguɾi/	prefix /pi-/
g.	peccary, dog	/abiana/, /wɔkɔɾi/	prefix /tɔ-/
h.	small birds: macaw, parrot, orange-cheeked, parakeet	/kaɾa, awɯ, kaɾaja, kaɾaum/, /ʧaɾɔkʧaɾɔ/, /kui/, /ɛɾidak/	prefix /ɛŋna-/
i.	toucan	/tɯapkɔ, pilik, kagak, ʧirɔ/	prefix /ɛŋnaɾa-/[55]
j.	spider monkey	/wɔŋɔum/	prefix /un-/
k.	squirrel monkey	/ʧamit/	infix /-pt-/
l.	howler monkey	/aɾun/	vowel nasalization
m.	tortoise	/jɔɾu/	murmuring the whole base word and lowering and/or fronting the first vowel, some vowels, or even all of the vowels from the base language; the optimal segment to be achieved is the low front vowel [æ]

The Arara ludlings have as their label in Arara [ilumbanbɔt] 'to make tongue' (i-lu-mban-bɔt = 3Abs-tongue-Verb-Purp). The Arara people do not use the word for tongue as a metaphor for language, except in these ludlings. The term they use for language/speech is [wɔɾunduŋɔ]. The Arara ludlings have the same inventory of phonemes that is found in the normal language. Each ludling will now be presented in detail.

4.2.1 Capuchin Monkey Talk

Capuchin monkeys are called *tawɛ* in Arara. The ludling for this species of monkey is labeled in Arara *tawɛ lumbanbɔt* 'to make the tongue of a capuchin monkey'. There are

[54] Borrowed word from Portuguese: galinha.

[55] The two prefixes /eŋna-/ and /eŋnara-/ appear to be completely unrelated to each other. That is, the last syllable made up of /ɾa-/ does not occur as an independent morpheme elsewhere in the language.

two steps to build the capuchin monkey ludling: (a) a morphological process that consists of adding the infix /-gV-/ right after the base word's last vowel, where the V is a vowel without underlying feature specifications, copying the phonological features of the last vowel from the word; and (b) a replacement of /ɾ/ by /l/.[56] Examples in (104) below show the ludlingant /-gV-/ added to base words ending in a consonant.

(104)	a.	ɛduɛt	ɛduɛgɛt	'his hammock'
	b.	ibam	ibagam	'his illegitimate father'
	c.	kɔk	kɔgɔk	'night, evening'
	d.	ɔɛt	ɔɛgɛt	'rubber tree, plastic'
	e.	pɔɾat	pɔlagat	'a catfish'

Examples in (105) show this same ludling added to base words ending in a vowel.

(105)	a.	aɛ	aɛgɛ	'a wasp'
	b.	nu[57]	nugu	'abcess, tumor'
	c.	ibaɾa	ibalaga	'no, nothing'
	d.	paɾu	palugu	'water'
	e.	kuɾi	kuligi	'bead'
	f.	pɔu	pɔugu	'small peccary'
	g.	ikpa	ikpaga	'mud'
	h.	muni	munigi	'my brother'

This ludlingant, like the other ones, can occur within polymorphemic words, such as nouns, verbs, adjectives, and even auxiliaries, as can be seen in (106) below (see Appendices 3 and 4).

(106)	a.	kɔkɔ-ŋmɔ uncle-Pl	kɔkɔŋmɔgɔ	'uncles'
	b.	k-ɔd-ɛmia-guɾugɛ-da 1Erg-Refl-hand-wash-Near	kɔdɛmiaguɾugɛdaga	'I am going to wash my own hand (near)'
	c.	tɔɾik-kom-bɛ big-Pl-Adjr	tɔlɛkombɛgɛ[58]	'they are big'

[56] This is the same kind of change that occurs in baby talk (see the introduction to this chapter).

[57] The phonetic representation for this example is [nuʔ]. A glottal stop is added to a CV content word when spoken in isolation. The glottal stop is not a phoneme in Arara.

[58] Here the speaker changed the /i/ of /tɔrik/ to [e].

d. kɔgɔlone [n-itʃ-a] kɔgɜlone [nitʃagaah][59] ‘leave it for tomorrow’
tomorrow [Abs-Aux-Perm]

It can be seen above that the ludlingant /-gV-/ occurs word-finally in polymorphemic words that end in open syllables, as it does in monomorphemic ones. However, there is one exception with the suffix for deceased beings: /-mgeni/. Here the suffix comes after the ludlingant:

(107) papa-mgeni papagamgeni[60] ‘my deceased father’
father-deceased

This probably happens because the meaning of the suffix refers to the whole word, including the ludlingant. In the general case, it is the ludlingant that seems to have scope over the whole word. Besides occurring in polymorphemic words, the ludlings in general also occur in larger linguistic structures, such as sentences.

	O	V	Oblique		
(108)	kala-ga	in-wɔ-tke-lɯ	kɔgɔnŋe-ge	taukala-ga	bɔk
	macaw.(sp.)-LUD	1Erg-kill-Iter-Rec	yesterday-LUD	inga.tree-LUD	on

‘I repeatedly killed macaws yesterday in the inga tree’

	S	AP		
(109)	taupa-ga	tɔrik-kɔm-bɛ-gɛ	tahiɛ[61]	kumɯk
	banana.(sp.)-LUD	big-Pl-Adjr-LUD	very	Rem

‘the bananas were very big’

As can be seen in (108) and (109) above, the changes triggered by the ludlingant only occur within the scope of a word, and thus do not affect the surrounding words, phonologically speaking. It can also be seen that the ludling sentences follow the same

[59] Here the speaker changed the second /ɔ/ of /kɔgɔlone/ to [ɜ]; this variation in common among some of the Arara speakers. He also added an extra [h] at the end of the utterance. Instead of the fricative, Arara speakers optionally use the stop [ʔ]. This process of adding a glottal at the end of an utterance is very common in normal speech.

[60] There is another example similar to this one in our data: /ug-ɛnba-ga-n-gom/ (12Abs-food-LUD-Poss-Pl) ‘it is our food’ (see Appendix 4, example (11)).

[61] In this sentence the speaker did not change the /ɾ/ into [l] in the stem [tɔɾik]; he also changed the /g/ into /h/: /tagie/ → [tahie].

grammatical structures of the Arara base language. For example, sentence (108) shows ergativity (see Section 3.2.2) and OV word order (see Section 3.2.3). It can also be seen that within a verbal sentence like (108), only the object has a ludlingant attached to it, but not the verb. On the other hand, the adverbial complements have a ludlingant attached to them. However, the attachment of a ludlingant to an adverbial phrase seems to be optional, since there is one example where there is no ludlingant attached to it: /kɔgɜlonɛ n-itʃ-a-gah/ 'leave it for tomorrow' (Appendix 4, example (19)). The grammatical word /bɔk/ does not have a ludlingant attached to it. Within a stative sentence, such as (109) above, both the subject and the adjectival predicate have a ludlingant attached to them, but not the adverb of intensity /tagie/ nor the tense marker /gumɯk/. The general data above show that this ludlingant occurs with all syllable types:

(110)	a.	V	pɔ.u	pɔugu	'small peccary'
	b.	CV	nu	nugu	'abcess, tumor'
	c.	VC	ɛ.du.ɛt	ɛduɛgɛt	'hammock'
	d.	CVC	i.bam	ibagam	'his illegitimate father'

In terms of this specific ludling which adds the infix /-gV-/ to a base word, according to Bagemihl (1996:699) the addition of affixes, and vowel copying, are common phenomena among the languages of the world.

4.2.2 Duski Titi Monkey Talk

Duski titi monkeys are called [kutʃamit] in Arara. The ludling for these species of monkeys is labeled in Arara [kutʃamit lumbanbɔt] 'to make the tongue of a duski titi monkey'. The morphological process used by the Arara people to build the duski titi monkey's ludling is the addition of the prefix [idi-] to the stem of the base language form, where it has a /d/ before an /i/, which is a rare sequence in the Arara base language (see Section 3.1.1). Here are some examples with the ludlingant /idi-/:

(111)	a.	nu	idinu	‘abcess, tumor’
	b.	wɔt	idiwɔt	‘fish’
	c.	kɔk	idigɔk[62]	‘night, evening’

We can see in the data above that there is no morphophonological process when [idi-] is attached to a monosyllabic word. Similarly, in some words starting with a CV syllable and where the next vowel of the stem is different from the vowel of this first CV syllable, there is no morphophonological process resulting from the addition of [idi-].

(112)	a.	malɔn	idimalon	‘that’s okay’
	b.	muni	idimuni	‘my brother’
	c.	ʧɛlɯ	iditʃɛlɯ	‘my sister’
	d.	kɯdɛn	idikɯdɛn	‘cassava’[63]
	e.	piluŋɔ	idipiluŋɔ	‘bird hind quarter’
	f.	pɔu	idibɔu	‘small peccary’

However, in a few stems with these same characteristics, there is deletion of the first CV syllable as a result of adding [idi-].

(113)	a.	idi-taupa	→ idi-∅∅upa	[idiupa]	‘a banana’
	b.	idi-nabiɔt	→ idi-∅∅biɔt	[idibiɔt]	‘sweet potato’

On the other hand, if a stem starts with a CV(C) syllable and the next vowel of the stem has the same backness as the first vowel of this CV(C) syllable, then deletion (haplology) extends to the vowel of this syllable: /idi-V[αback](C)CV[αback](C)/ → [idi∅∅(C)CV].

(114)	a.	/idi-jeme/	→ idi-∅∅me	[idime]	‘mom, my mother’
	b.	/idi-kɔkɔ/	→ idi-∅∅kɔ	[idikɔ]	‘my uncle’
	c.	/idi-papa/	→ idi-∅∅pa	[idipa]	‘dad’
	d.	/idi-pɔmu/	→ idi-∅∅mu	[idimu]	‘beetle (sp.)’
	e.	/idi-kutkut/	→ idi-∅∅tkut	[iditkut]	‘night monkey’
	f.	/idi-womjum/	→ idi-∅∅mjum	[idimium][64]	‘banana (generic)’

[62] The variation between [kɔk] and [idi-gɔk] is better analyzed as a devoicing process than a voicing process (see Section 3.1.1, examples (21) and (22)).

[63] Other examples from Appendix 3 are: /muɾɛi/ → [idimuɾei] ‘bench’, /pɛɾa/ → [idibeɾa] ‘a fruit’, /pɯɾak/ → [idibɯɾak] ‘an arrow’, and /pɔɾat/ → [idibɔɾat] ‘a catfish’.

[64] Phonetically speaking, the /j/ turns into the vowel [i], here and elsewhere.

As seen in (114e-f) this deletion process does not extend to a coda of a vowel to be deleted. Furthermore, there seem to be exceptions to the deletion process, since a vowel with the same backness as another one in the following syllable is not deleted in a few stems:

(115)	a.	/kamap/	[idikamap]	‘gourd container’
	b.	/wakat/	[idiwakat]	‘alligator, cayman’
	c.	/manaŋ/	[idimanaŋ]	‘a coconut bug’

There are other examples with fluctuation, such as /kara/ ‘macaw (type of)’, where the speaker once said /idigara/ and another time /idiara/. If the stem starts with a vowel, this vowel is deleted: /idi-V/ → [idi∅]. Examples are given below:

(116)	a.	idi-ae	→ idi-∅e	[idie]	‘wasp (sp.)’
	b.	idi-abat	→ idi-∅bat	[idibat]	‘manioc bread’
	c.	idi-amuɾu	→ idi-∅muɾu	[idimuɾu]	‘his/her drink’
	d.	idi-ɛmiaɾɯ	→ idi-∅miaɾɯ	[idimiaɾɯ]	‘his/her hand’
	e.	idi-ɯpɯ	→ idi-∅pɯ	[idipɯ]	‘yam’

A similar phonological phenomenon occurs in the Arara normal language, as seen in Section 3.1.4 (specifically, Progressive Vowel Deletion), where the second vowel is deleted in a vowel sequence. Again, if the vowel to be deleted in the ludling form has a coda, the coda is not subject to deletion:

(117)	a.	idi-ɛnbɛn	→ idi-∅nbɛn	[idinben]	‘penis’
	b.	idi-ikpa	→ idi-∅kpa	[idikpa]	‘mud’
	c.	idi-ɔtpidɔ	→ idi-∅tpidɔ	[iditpidɔ]	‘armadillo’

As can be seen in (107), a consonant in coda position preserves its voicing feature after the deletion process. If the vowel to be deleted is followed by a non-final syllable starting with an /ɾ/, the deletion extends to this syllable.

(118)	ɔɾɛmi	idi-ɔɾɛmi	→ idi-∅∅∅mi	[idimi]	‘a fish’

For now, only (118) was found as an example. If the /ɾ/-syllable occurs at the end of the (first) stem, it will not be subject to the deletion process, as can be seen in (119) below:

(119)	a.	idi-kuɾɔ-kuɾɔ[65]	→	idi-∅∅ɾɔ-kuɾɔ	[idiɾɔkuɾɔ]	‘a bird’
	b.	idi-kuɾɛ-p	→	idi-∅∅ɾɛ-p	[idiɾep]	‘it is good’
	c.	idi-wɯɾɯ-pɛ	→	idi-∅∅ɾɯp-pɛ	[idiɾɯpɛ]	‘it is bad’
	d.	idi-tɔɾik-kɔm-bɛ	→	idi-∅∅ɾik-kɔm-bɛ	[idiɾikombɛ]	‘they are big’

This ludlingant, like the other ones, can occur within polymorphemic words, such as nouns, verbs, adjectives, and adverbs, as can be seen in (120) below (see Appendices 3 and 4).

(120)	a.	i-ɛnma-n 1Abs-path-Poss	idinman	‘my path’
	b.	k-ɔd-ɛmia-guɾugɛ-da 1Erg-Refl-hand-wash-Near	idimiaguɾugɛda	‘I am going to wash my own hand (near)’
	c.	tɔɾik-kom-bɛ big-Pl-Adjr	idiɾikɔmbɛ	‘it is big’
	d.	kɔgɔlɔnɛ n-itʃ-a tomorrow Abs-Aux-Perm	idigɜlɜnɛ nitʃ̬[66]	‘leave it for tomorrow’

It can be seen above that the ludlingant /idi-/ occurs word-initially in polymorphemic words, as it does in monomorphemic ones. In (120a and b) the deletion process goes over the vowel of the prefix and is extended to the first vowel of the stem, deleting two vowels. In monomorphemic words (see example (116a) above) the deletion process deletes only one vowel, not extending deletion over the second vowel of the stem. In (120a and b) the deletion acts completely over the personal and reflexive prefixes. The example below also shows the complete deletion of a prefix:

(121)	ugu-ptʃi-n-gɔm 12Abs-leg-Poss-Pl	idiptʃingɔm	‘our (incl.) leg’

As happens with /-gV-/, the ludling /idi-/ also occur in larger linguistic structures, such as sentences.

	O	V	Oblique		
(122)	idi-aɾa	in-wɔ-tkɛ-lɯ	idi-gɔnŋɛ	idi-ukaɾa	bɔk
	LUD-macaw.(sp.)	1Erg-kill-Iter-Rec	LUD-yesterday	LUD-inga.tree	on
	‘I repeatedly killed macaws yesterday in the inga tree’				

[65] Word formed through reduplication.

[66] Here there is a variation with the vowel: /a/ → [ɜ].

	S	AP	
(123)	idi-upa	tɜɾik-kom-bɛ	tɜ(giɛ)
	LUD-banana	big-Pl-Adjr	very
	'the bananas are very big'		

Again, as triggered by the ludling /-gV-/, the changes triggered by /idi-/ only occur within the scope of a word, and thus do not affect the surrounding words, phonologically speaking. The same occurs in terms of grammatical structures, following the patterns of the base language. Some words that start with a voiceless stop in the Arara base language preserve their voiceless nature after the addition of the ludlingant /idi-/, while others do not, changing from voiceless to the corresponding voiced counterparts, as can be seen below:

(124)	a.	piluŋɔ	idipiluŋɔ	'bird hind quarter'
	b.	pɔu	idibɔu	'small peccary'
(125)	a.	kɯdɛn	idikɯdɛn	'cassava'
	b.	kɔʧi	idigɔʧi	'a fish'

As can be seen in (124a) and (125a) above, neither [p] nor [k] voices after the addition of /idi-/. However, in examples (124b) and (125b), both [p] and [k] voice after this ludlingant. Therefore, the variation between [p] and [b], and [k] and [g] is better explained as a devoicing process (utterance-initially) than a voicing process after a vowel across a morpheme boundary. This same kind of devoicing process is found in the Arara base language (see Section 3.1.1, examples (21) and (22)). There is no example showing this variation between the alveolar stops [t] and [d]. Only the voiceless counterpart occurs in this environment.

(126)	a.	takɯi	iditakɯi	'manioc flour'
	b.	tawɛ	iditawɛ	'capuchin monkey'
	c.	tamgɔ	iditamgɔ	'old man, grandfather'
	d.	tuktɔ	idituktɔ	'cultivated field'

Absence in the variation of voicing between the alveolar stops may be due to limited data. This same absence of variation is also present among the affricates [ʧ] and [ʤ], but

this is expected from the base language, where an affricate does not voice after a vowel. It voices only after a nasal consonant (see Section 3.1.1, examples (12)). The general data show that the ludlingant /idi-/ occurs with all syllable types:

(127)	a.	V	a.ɛ	idiɛ	'a wasp'
	b.	CV	kɯ.dɛn	idikɯdɛn	'cassava'
	c.	VC	ik.pa	idikpa	'a fish'
	d.	CVC	kut.kut	iditkut	'night monkey'

All the ludlings formed by prefixation, except for /un-/, such as /idi-/, /wi-/, /pɔ-/, /nɯ-/, /pi-/, /tɔ-/, /ɛŋna-/, and /ɛŋnaɾa-/, work in similar ways in terms of phonological processes, mainly the last seven ones that have the syllabic shape CV.

4.2.3 Large Bird Talk

Large birds, including chickens, muscovy ducks, Brazilian mergansers, guans, and curassows are, respectively, called [ʧaɾina], [bakeni], [jaɾambi] [wogaɾaum], and [pawi] in Arara. The ludling for these species of large birds is labeled in Arara [ʧaɾina, bakeni, jaɾambi, wogaɾaum, pawi bene lumbanbɔt] 'to make the tongue of chickens, muscovy ducks, Brazilian mergansers, guans, and curassows'. The morphological process used by the Arara people to build these large birds' ludling is the addition of the /wi-/ prefix.

(128)	a.	nu	winu	'abcess, tumor'
	b.	wɔt	wiwɔt	'fish'
	c.	kɔk	wigɔk	'night, evening'

The phonological patterns of this ludling work almost exactly the same way as those of the ludling /idi-/. See section 4.2.2 (Duski Titi Monkeys Talk) for a description of these phonological patterns, which are analogous to that ludling. Thus the data in (128) show examples of the /wi-/ ludling in monosyllabic words. In (129) below there are examples of this ludling attached to polysyllabic words, resulting in a haplology process: /wi-(C)V/ → [wi(∅)∅].

(129)	a.	wi-aɛ	→	wi-∅ɛ	[wiɛ]	'a wasp'
	b.	wi-taupa	→	wi-∅∅upa	[wiupa]	'a banana'
	c.	wi-ɔɛt	→	wi-∅ɛt	[wiet]	'rubber tree'

d.	wi-abat	→	wi-∅bat	[wibat]	‘manioc bread’
e.	wi-onat	→	wi-∅nat	[winat]	‘corn’
f.	wi-jɛmɛ	→	wi-∅∅mɛ	[wime]	‘mom, my mother’
g.	wi-pɔmu	→	wi-∅∅mu	[wimu]	‘a beetle’
h.	wi-ɔrɛmi	→	wi-∅rɛmi	[wirɛmi]	‘a fish’
i.	wi-muni	→	wi-∅∅ni	[wini]	‘my brother’

It is interesting to note that example (129h) shows that /wi-/ triggers a different phonemic process than the ludlingant /idi-/ above. The /idi-/ extends deletion to the next syllable with an /ɾ/-onset (see example (118) above); /wi-/ does not extend deletion to this /ɾ/-initial syllable. On the other hand, similar to /idi-/, here this deletion process does not extend to the coda of a vowel to be deleted.

(130)						
	a.	wi-ɛnbɛn	→	wi-∅nbɛn	[winben]	‘his penis’
	b.	wi-ikpa	→	wi-∅kpa	[wikpa]	‘mud’
	c.	wi-ɔtpidɔ	→	wi-∅tpidɔ	[witpidɔ]	‘armadillo’
	d.	wi-kutkut	→	wi-∅∅tkut	[witkut]	‘night monkey’
	e.	wi-womjum	→	wi-∅∅mjum	[wimium]	‘banana’

This ludlingant, as /idi-/ and the other ludlings, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (131) below (see Appendices 3 and 4).

(131)				
	a.	i-ɛnma-n 1Abs-path-Poss	winman	‘my path’
	b.	k-ɔd-ɛmia-gurugɛ-da 1Erg-Refl-hand-wash-Near	widɛmiagurugɛda	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ 1Erg-write-Rec	windɛkɛlɯ	‘I wrote it’
	d.	tɔrik-kɔm-bɛ big-Pl-Adjr	wɛrik-kɔm-bɛ[67]	‘they are big’

Unlike the ludling /idi-/, the deletion here does not act over the personal and reflexive prefixes, only over the first CV syllable, as in (131b) above. But like /idi-/, it deletes identical vowels in a prefix:

(132)	ugu-ptʃi-n-gɔm 12Abs-leg-Poss-Pl	wiptʃingɔm	‘our (incl.) leg’

[67] Here the speaker changed /wi-/ to [we-] ‘LUD’, in a dissimilation process.

In terms of exceptions, in a couple of words starting with a bilabial consonant, no deletion occurs:

(133)	a.	pɔu	wibɔu	*wiu	‘small peccary’
	b.	pɔɾat	wibɔɾat	*wiɾat	‘catfish’

There are similar examples where the deletion process does apply:

(134)	a.	pɯɾak	wiɾak	‘arrow (type of)’
	b.	pɛɾa	wiɾa	‘fruit (type of)’

As the /idi-/ ludling, /wi-/ also occurs in sentences, following the parameters of the base language.

	O	V	Oblique		
(135)	wi-ɾa	in-wɔ-tkɛ-lɯ	wi-gɔnŋɛ	wi-ukaɾa	bɔk
	LUD-macaw.(sp.)	1Erg-kill-Iter-Rec	LUD-yesterday	LUD-inga.tree	on
	‘I repeatedly killed macaws yesterday in the inga tree’				

	S	AP	
(136)	wi-upa	wi-ɾik-kɔm-bɛ	da(giɛ)
	LUD-banana.(sp.)	LUD-big-Pl-Adjr	very
	‘the bananas are very big’		

The ludlingant /wi-/, as does /idi-/, also demonstrates the devoicing process of stops.

(137)	a.	piluŋɔ	wipiluŋɔ	‘bird hind quarter’
	b.	pɔu	wibɔu	‘small peccary’

It was seen that in the /idi-/ ludling there is no example of variation of voicing between the alveolar stops [t] and [d]. With /wi-/, in addition to [t] and [d], there is also no example showing variation of voicing between the velar [k] and [g], mainly because of the deletion process over the CV syllable word-initially, such as in the following examples:

(138)	a.	takɯi	wikɯi	‘manioc flour’
	b.	tawɛ	wiwɛ	‘capuchin monkey’
	c.	tamgɔ	wimgɔ	‘old man, grandfather’
	d.	tuktɔ	wiktɔ	‘cultivated field’
	e.	kɯdɛn	widɛn	‘cassava’
	f.	kɔʧi	wiʧi	‘a fish’

This deletion process is also true of the palatal affricate [ʧ].

(139)	a.	ʧɛlɯ	wilɯ	‘sister’
	b.	ʧamit	wimit	‘squirrel monkey’

The general data also show that this ludling occurs with all syllable types.

(140)	a.	V	a.ɛ	wiɛ	‘a wasp’
	b.	CV	kɯ.dɛn	widɛn	‘cassava’
	c.	VC	ik.pa	wikpa	‘mud’
	d.	CVC	kut.kut	witkut	‘night monkey’

4.2.4 Trumpeter and Woodpecker Talk

Trumpeters and woodpeckers are, respectively, called [waɾakina] and [iebɛɾɛbɯɾɯ] in Arara. The ludling for these species of animals is labeled in Arara [waɾakina iebɛɾɛbɯɾɯ bene lumbanbɔt] ‘to make the tongue of the trumpeters and woodpeckers’. The morphological process used by the Arara people to build the trumpeters’ and woodpeckers’ ludling is the addition of a /pɔ-/ prefix.

(141)	a.	nu	pɔnu	‘abcess, tumor’
	b.	wɔt	pɔwɔt	‘fish’
	c.	kɔk	pɔgɔk	‘night, evening’

The phonological patterns of this ludling work almost exactly the same way as those of the /idi-/ and /wi-/ ludlings. However, it is much more similar to the patterns of the /wi-/ ludling (see Section 4.2.3). Thus, example (141) illustrates the ludlingant /pɔ-/ in monosyllabic words. In (142) below there are examples of this ludling attached to polysyllabic words, resulting in the haplology process: /pɔ-(C)V/ → [pɔ(∅)∅]. Here are some examples:

(142)	a.	pɔ-aɛ	→	pɔ-∅ɛ	[pɔɛ]	‘a wasp’
	b.	pɔ-taupa	→	pɔ-∅∅upa	[pɔupa]	‘a banana’
	c.	pɔ-ɔɛt	→	pɔ-∅ɛt	[pɔet]	‘rubber tree’
	d.	pɔ-abat	→	pɔ-∅bat	[pɔbat]	‘manioc bread’
	e.	pɔ-ɔnat	→	pɔ-∅nat	[pɔnat]	‘corn’
	f.	pɔ-jɛmɛ	→	pɔ-∅∅mɛ	[pɔmɛ]	‘mom, my mother’
	g.	pɔ-pɔmu	→	pɔ-∅∅mu	[pɔmu][68]	‘a beetle’

[68] Here the word resulting after the addition of the ludlingant is coincident with the base Word. Therefore, there is a homonym process between the base language and this ludling, in this case.

h.	pɔ-ɔrɛmi	→	pɔ-∅rɛmi	[pɔ̲remi]	‘a fish’
i.	pɔ-kurɔ-kurɔ	→	pɔ-∅∅rɔ-kurɔ	[pɔ̲rɔkurɔ]	‘a bird’
j.	pɔ-muni	→	pɔ-∅∅ni	[pɔ̲ni]	‘my brother’

Like /wi-/, this ludlingant does not extend deletion to an /r/-initial syllable (see Section 4.2.3). And like all the other (V)CV prefixed ludlings, it does not extend deletion to the coda of a vowel to be deleted.

(143)	a.	pɔ-ɛnbɛn	→ pɔ-∅nbɛn	[pɔ̲nben]	‘his penis’
	b.	pɔ-ikpa	→ pɔ-∅kpa	[pɔ̲kpa]	‘mud’
	c.	pɔ-ɔtpidɔ	→ pɔ-∅tpidɔ	[pɔ̲tpidɔ]	‘armadillo’
	d.	pɔ-kutkut	→ pɔ-∅∅tkut	[pɔ̲tkut]	‘night monkey’
	e.	pɔ-womjum	→ pɔ-∅∅mjum	[pɔ̲mium]	‘banana’

This ludlingant, like the other ones, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (144) below (see Appendices 3 and 4).

(144)	a.	i-ɛnma-n 1Abs-path-Poss	pɔ̲nman	‘my path’
	b.	k-ɔd-ɛmia-gurugɛ-da 1Erg-Refl-hand-wash-Near	pɔ̲dɛmiagurugɛda	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ 1Erg-write-Rec	pɔ̲ndɛkɛlɯ	‘I wrote it’
	d.	tɔrik-kɔm-bɛ big-Pl-Adjr	pɔ̲rik-kɔm-bɛ	‘they are big’

Like the ludling /wi-/, and unlike /i̲di̲-/, the deletion here does not act over the personal and reflexive prefixes, only over the first CV syllable of the word, as in (144b) above. But unlike /idi-/ and /wi-/, it does not delete identical vowels in a prefix:

(145)	ugu-ptʃi-n-gɔm 12Abs-leg-Poss-Pl	pɔ̲gɔptʃingɔm[69]	‘our (incl.) leg’

Like /wi-/, there are exceptions to the deletion process (/pɔ-(C)V/ → [pɔ(∅)∅]):

(146)	a.	pɔu	pɔ̲bɔu	*pɔ̲u	‘small peccary’
	b.	pɔrat	pɔ̲bɔrat	*pɔ̲rat	‘catfish’

There are similar examples where the deletion process does apply:

(147)	a.	pɯrak	pɔ̲rak	‘an arrow’
	b.	pɛra	pɔ̲ra	‘a fruit’

[69] Here the expected form is [pɔguptʃingom]; or better yet, [pɔptʃingom], deleting the whole prefix /ugu-/, as occurs with the other ludlings.

Like the two previous ludlings formed by prefixation (/idi-/ and /wi-/), this ludling also occurs in sentences, following the parameters of the base language.

	O	V	Oblique		
(148)	pɔ-ɾa	in-wɔ-tkɛ-lɯ	pɔ-gɔnŋɛ	pɔ-ukaɾa	bɔk
	LUD-macaw.(sp.)	1Erg-kill-Iter-Rec	LUD-yesterday	LUD-inga.tree	on
	'I repeatedly killed macaws yesterday in the inga tree'				

	S	AP	
(149)	pɔ-upa	pɔ-ɾik-kom-bɛ	tagiɛ
	LUD-banana.(sp.)	LUD-big-Pl-Adjr	very
	'the bananas are very big'		

And like /idi-/ and /wi-/, this ludling also demonstrates the devoicing process of stops.

(150)	a.	piluŋɔ	pɔ̲piluŋɔ	'bird hind quarter'
	b.	pɔu	pɔ̲bɔu	'small peccary'

And like /wi-/, there is no example showing variation of voicing between the alveolar [t] and [d], and velar [k] and [g], mainly because of the deletion process over the CV syllable word-initially, such as in the following examples:

(151)	a.	takɯi	pɔ̲kɯi	'manioc flour'
	b.	tawɛ	pɔ̲wɛ	'capuchin monkey'
	c.	tamgɔ	pɔ̲mgɔ	'old man, grandfather'
	d.	tuktɔ	pɔ̲ktɔ	'cultivated field'
	e.	kɯdɛn	pɔ̲dɛn	'cassava'
	f.	kɔʧi	pɔ̲ʧi	'a fish'

This deletion process is also true of the palatal affricate [ʧ]:

(152)	a.	ʧɛlɯ	pɔ̲lɯ	'sister'
	b.	ʧamit	pɔ̲mit	'squirrel monkey'

Like the other ludlings, the general data show that this ludling occurs with all syllable types:

(153)	a.	V	a̲.e	pɔ̲e	'a wasp'
	b.	CV	kɯ̲.dɛn	pɔ̲dɛn	'cassava'
	c.	VC	i̲k.pa	pɔ̲kpa	'mud'
	d.	CVC	ku̲t.kut	pɔ̲tkut	'night monkey'

4.2.5 Coati Talk

Coatis are called [ʧiɾuka] in Arara. The ludling for this species of animal is labeled in Arara [ʧiɾuka lumbanbɔt] 'to make the tongue of the coati'. The morphological process

used by the Arara people to build the coati's ludling is the addition of a /nɛ-/ or /nɯ-/ prefix.[70]

(154)	a.	nu	nɯnu	'abcess, tumor'
	b.	wɔt	nɯwɔt	'fish'
	c.	kɔk	nɯgɔk	'night, evening'

The phonological patterns of this ludling work almost exactly the same way as those of the prefixed ludlings already presented. However, it is much more similar to the patterns of those ludlings formed of two phonemes, such as /wi-/ and /pɔ-/ (see Sections 4.2.3 and 4.2.4). Thus, example (154) illustrates the ludlingant /nɯ-/ in monosyllabic words. In (155) below there are examples of this ludling attached to polysyllabic words, resulting in a haplology process: /nɯ-(C)V/ → [nɯ∅∅]. Here are some examples:

(155)	a.	nɯ-aɛ	→	nɯ-∅ɛ	[nɯe]	'a wasp'
	b.	nɯ-taupa	→	nɯ-∅∅upa	[nɯupa]	'a banana'
	c.	nɯ-ɔɛt	→	nɯ-∅ɛt	[nɯet]	'rubber tree'
	d.	nɯ-abat	→	nɯ-∅bat	[nɯbat]	'manioc bread'
	e.	nɯ-ɔnat	→	nɯ-∅nat	[nɯnat]	'corn'
	f.	nɯ-jɛmɛ	→	nɯ-∅∅mɛ	[nɯme]	'mom, my mother'
	g.	nɯ-pɔmu	→	nɯ-∅∅mu	[nɯmu]	'a beetle'
	h.	nɯ-ɔɾɛmi	→	nɯ-∅ɾɛmi	[nɯɾemi]	'a fish'
	i.	nɯ-kuɾɔ-kuɾɔ	→	nɯ-∅∅ɾɔ-kuɾɔ	[nɯɾɔkuɾɔ]	'a bird'
	j.	nɯ-muni	→	nɯ-∅∅ni	[nɯni]	'my brother'

Like the other prefixed ludlings formed of two phonemes, this ludlingant does not extend deletion to an /ɾ/-initial syllable. And like all the other (V)CV prefixed ludlings, it does not extend deletion to the coda of a vowel to be deleted.

(156)	a.	nɯ-ɛnbɛn	→	nɯ-∅nbɛn	[nɯnben]	'his penis'
	b.	nɯ-ikpa	→	nɯ-∅kpa	[nɯkpa]	'mud'
	c.	nɯ-ɔtpidɔ	→	nɯ-∅tpidɔ	[nɯtpidɔ]	'armadillo'
	d.	nɯ-kutkut	→	nɯ-∅∅tkut	[nɯtkut]	'night monkey'
	e.	nɯ-wɔmjum	→	nɯ-∅∅mjum	[nɯmium]	'banana'

This ludlingant, like the other ones, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (157) below (see Appendices 3 and 4).

[70] During my latest field work (2010), I collected data mainly with the /nɯ-/ prefix; before that, data were formed with [ne-]. I will use /nɯ-/ here, since it is the most recent form noted.

(157)	a.	i-ɛnma-n 1Abs-path-Poss	nɯnman	‘my path’
	b.	k-ɔd-ɛmia-gurugɛ-da 1Erg-Refl-hand-wash-Near	nɯdɛmiagurugɛda	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ 1Erg-write-Rec	nɯndɛkɛlɯ	‘I wrote it’
	d.	tɔɾik-kɔm-bɛ big-Pl-Adjr	nɜɾik-kɔm-bɛ[71]	‘they are big’

Like the ludlings formed of two phonemes, and unlike /idi-/, the deletion here does not act over the personal and reflexive prefixes, only over the first CV syllable, as in (157b) above. And like all of the prefixed ludlings, except for /pɔ-/, the ludlingant here deletes identical vowels in a prefix:

(158)	ugu-ptʃi-n-gɔm 12Abs-leg-Poss-Pl	nɯptʃingɔm	‘our (incl.) leg’

Also like the other prefixed ludlings, there are exceptions to the deletion process /nɯ-(C)V/ → [nɯ(∅)∅]:

(159)	a.	pɔu	nɯbɔu	*nɯu	‘small peccary’
	b.	pɔɾat	nɯbɔɾat	*nɯɾat	‘catfish’

Like the other prefixed ludlings, there are also similar examples where the deletion process does apply:

(160)	a.	pɯɾak	nɯɾak	‘an arrow’
	b.	pɛɾa	nɯɾa	‘a fruit’

And like all of the ludlings, /nɯ-/ also occurs in sentences, following the parameters of the base language.

	O	V	Oblique		
(161)	nɯ-ɾa	in-wɔ-tke-lɯ	nɯ-gɔnŋe	nɯ-ukaɾa	bɔk
	LUD-macaw.(sp.)	1Erg-kill-Iter-Rec	LUD-yesterday	LUD-inga.tree	on
	‘I repeatedly killed macaws yesterday in the inga tree’				

[71] This datum is part of the latest recordings I made, in 2010. The speaker used different forms for this ludlingant, such as /ni-/, /nɛ-/, /nə-/, etc.

	S		AP		
(162)	nə-upa		ne-mi-am	nə-ɾik-kom-be	tah(ie)
	LUD-banana.(sp.)		LUD-hand-Loc	LUD-big-Pl-Adjr	very
	'the bananas in his/her hand are very big'				

Like the other ludlings, this ludling also shows the devoicing process of stops.

(163)	a.	piluŋɔ	nɯpiluŋɔ	'bird hind quarter'
	b.	pou	nɯbou	'small peccary'

And like the ludlings formed of two phonemes, there is no example with variation of voicing between the alveolar [t] and [d], and velar [k] and [g], mainly because of the deletion process over the CV syllable word-initially, such as in the following examples:

(164)	a.	takɯi	nɯkɯi	'manioc flour'
	b.	tawɛ	nɯwɛ	'capuchin monkey'
	c.	tamgɔ	nɯmgɔ	'old man, grandfather'
	d.	tuktɔ	nɯktɔ	'cultivated field'
	e.	kɯden	nɯden	'cassava'
	f.	kɔʧi	nɯʧi	'a fish'

Yet, like the other prefixed ludlings formed of two phonemes, there are examples of deletion of the palatal affricate [ʧ].

(165)	a.	ʧɛlɯ	nɯlɯ	'sister'
	b.	ʧamit	nɯmit	'squirrel monkey'

Like the other ludlings, the general data show that this ludling occurs with all syllable types:

(166)	a.	V	a.e	nɯe	'a wasp'
	b.	CV	kɯ.den	nɯden	'cassava'
	c.	VC	ik.pa	nɯkpa	'mud'
	d.	CVC	kut.kut	nɯtkut	'night monkey'

4.2.6 Agouti Talk

Agoutis are called [jaguɾi] in Arara. The ludling for these species of animals is labeled in Arara [jaguɾi lumbanbɔt] 'to make the tongue of agoutis'. The morphological process used by the Arara people to build these animals' ludling is the addition of a /pi-/ prefix.

(167)	a.	nu	pinu	'abcess, tumor'
	b.	wɔt	piwɔt	'fish'
	c.	kɔk	pigɔk	'night, evening'

The phonological patterns of this ludling work almost exactly the same way as those of the prefixed ludlings already presented. However, it is much more similar to the patterns of those ludlings formed of two phonemes (see the ludlings above). Thus, example (167) illustrates the ludlingant /pi-/ in monosyllabic words. In (168) below there are examples of this ludling attached to polysyllabic words, resulting in a haplology process: /pi-(C)V/ → [pi(∅)∅]. Here are some examples:

(168)	a.	pi-aɛ	→	pi-∅ɛ	[pie]	‘a wasp’
	b.	pi-taupa	→	pi-∅∅upa	[piupa]	‘a banana’
	c.	pi-ɔet	→	pi-∅et	[piet]	‘rubber tree’
	d.	pi-abat	→	pi-∅bat	[pibat]	‘manioc bread’
	e.	pi-onat	→	pi-∅nat	[pinat]	‘corn’
	f.	pi-jeme	→	pi-∅∅me	[pime]	‘mom, my mother’
	g.	pi-pɔmu	→	pi-∅∅mu	[pimu]	‘a beetle’
	h.	pi-ɔɾemi	→	pi-∅ɾemi	[piɾemi]	‘a fish’
	i.	pi-kuɾɔ-kuɾɔ	→	pi-∅∅ɾɔ-kuɾɔ	[piɾɔkuɾɔ]	‘a bird’
	j.	pi-muni	→	pi-∅∅ni	[pini]	‘my brother’

Like other prefixed ludlings formed of two phonemes, this ludlingant does not extend deletion to an /ɾ/-initial syllable. And like the other (V)CV prefixed ludlings, it does not extend deletion to the coda of a vowel to be deleted.

(169)	a.	pi-enben	→	pi-∅nben	[pinben]	‘his penis’
	b.	pi-ikpa	→	pi-∅kpa	[pikpa]	‘mud’
	c.	pi-ɔtpidɔ	→	pi-∅tpidɔ	[pitpidɔ]	‘armadillo’
	d.	pi-kutkut	→	pi-∅∅tkut	[pitkut]	‘night monkey’
	e.	pi-womjum	→	pi-∅∅mjum	[pimium]	‘banana’

This ludlingant, like any other, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (170) below (see Appendices 3 and 4).

(170)	a.	i-ɛnma-n 1Abs-path-Poss	pinman	‘my path’
	b.	k-ɔd-ɛmia-guɾugɛ-da 1Erg-Refl-hand-wash-Near	pidemiaguɾugɛda	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ 1Erg-write-Rec	pindɛkɛlɯ	‘I wrote it’

	d.	tɔɾik-kɔm-bɛ big-Pl-Adjr	peɾik-kɜm-bɛ[72]	‘they are big’

Like the ludlings formed of two phonemes, and unlike /idi-/, the deletion here does not act over the personal and reflexive prefixes, only over the first (C)V syllable. And like all of the prefixed ludlings, except for /pɔ-/, the ludlingant here deletes identical vowels in a prefix:

(171)	ugu-ptʃi-n-gɔm 12Abs-leg-Poss-Pl	piptʃingɔm	‘our (incl.) leg’

Also like the other prefixed ludlings, there are exceptions to the deletion process /pi-(C)V/ → [pi(∅)∅]:

(172)	a.	pɔu	pibɔu	*piu	‘small peccary’
	b.	pɔɾat	pibɔɾat	*piɾat	‘catfish’
	c.	malɔn	pimalɔn	*pilɔn	‘that’s okay’

Like the other prefixed ludlings, there are also similar examples where the deletion does apply:

(173)	a.	pɯɾak	piɾak	‘an arrow’
	b.	pɛɾa	piɾa	‘a fruit’

And like all of the ludlings, /pi-/ also occurs in sentences, following the parameters of the base language.

	O	V	Oblique		
(174)	pi-ɾa	in-wɔ-tkɛ-lɯ	pi-gɔnŋɛ	pi-ukaɾa	bɔk
	LUD-macaw.(sp.)	1Erg-kill-Iter-Rec	LUD-yesterday	LUD-inga.tree	on
	‘I repeatedly killed macaws yesterday in the inga tree’				

	Adv:Manner		V	Oblique: Source
(175)	pi-pɔɾɛ	tagiɛ	w-ɛbɯ-lɯ	pi-dua-n-dubɔ-p
	LUD-empty	very	1Erg-arrive-Rec	LUD-forest-Ela-Former-now
	‘I arrived from the forest without any load’			

Like other ludlings, this ludling also shows the devoicing process of stops.

(176)	a.	piluŋɔ	pipiluŋɔ	‘bird hind quater’
	b.	pɔu	pibɔu	‘small peccary’

[72] This is a variant of [piɾikombɛ].

And like the ludlings formed of two phonemes, there is no example with variation of voicing between the alveolar [t] and [d], and velar [k] and [g], mainly because of the deletion process over the CV syllable word-initially, such as in the following examples:

(177)	a.	takɯi	pikɯi	‘manioc flour’
	b.	tawɛ	piwɛ	‘capuchin monkey’
	c.	tamgɔ	pimgɔ	‘old man, grandfather’
	d.	tuktɔ	piktɔ	‘cultivated field’
	e.	kɯdɛn	pidɛn	‘cassava’
	f.	kɔʧi	piʧi	‘a fish’

Yet, like the other prefixed ludlings formed of two phonemes, there are examples of deletion of the palatal affricate [ʧ].

(178)	a.	ʧɛlɯ	pilɯ	‘sister’
	b.	ʧamit	pimit	‘squirrel monkey’

Like the other ludlings, the general data show that this ludling occurs with all syllable types:

(179)	a.	V	a.ɛ	piɛ	‘a wasp’
	b.	CV	kɯ.dɛn	pidɛn	‘cassava’
	c.	VC	ik.pa	pikpa	‘mud’
	d.	CVC	kut.kut	pitkut	‘night monkey’

4.2.7 Peccary and Dog Talk

Peccaries and dogs are, respectively, called [abianã] and [wɔkɔɾi] in Arara. The ludling for these species of animals is labeled in Arara [abiana wokɔɾi bene lumbanbɔt] ‘to make the tongue of the peccary and the dog’. The morphological process used by the Arara people to build the peccary’s and dog’s ludling is the addition of a /tɔ-/ prefix.

(180)	a.	nu	tɔnu	‘abcess, tumor’
	b.	wɔt	tɔwɔt	‘fish’
	c.	kɔk	tɔgɔk	‘night, evening’

The phonological patterns of this ludling work almost exactly the same way as those of the prefixed ludlings already analyzed. However, it is much more similar to the patterns of those ludlings formed of two phonemes (see these ludlings above). Thus, example (180) illustrates the ludlingant /tɔ-/ in monosyllabic words. In (181) below there

are examples of this ludling attached to polysyllabic words, resulting in a haplology process: /tɔ-(C)V/ → [tɔ(∅)∅]. Here are some examples:

(181)	a.	tɔ-aɛ	→ tɔ-∅ɛ	[tɔ̲e]	‘a wasp’
	b.	tɔ-taupa	→ tɔ-∅∅upa	[tɔ̲upa]	‘a banana’
	c.	tɔ-ɔɛt	→ tɔ-∅ɛt	[tɔ̲et]	‘rubber tree’
	d.	tɔ-abat	→ tɔ-∅bat	[tɔ̲bat]	‘manioc bread’
	e.	tɔ-ɔnat	→ tɔ-∅nat	[tɔ̲nat]	‘corn’
	f.	tɔ-jɛmɛ	→ tɔ-∅∅mɛ	[tɔ̲me]	‘mom, my mother’
	g.	tɔ-pɔmu	→ tɔ-∅∅mu	[tɔ̲mu]	‘a beetle’
	h.	tɔ-ɔɾɛmi	→ tɔ-∅ɾɛmi	[tɔ̲ɾemi]	‘a fish’
	i.	tɔ-kuɾɔ-kuɾɔ	→ tɔ-∅∅ɾɔ-kuɾɔ	[tɔ̲ɾɔkuɾɔ]	‘a bird’
	j.	tɔ-muni	→ tɔ-∅∅ni	[tɔ̲ni]	‘my brother’

Like the other prefixed ludlings formed of two phonemes, this ludlingant does not extend deletion to an /ɾ/-initial syllable. And like all the other (V)CV prefixed ludlings, it does not extend deletion to the coda of a vowel to be deleted.

(182)	a.	tɔ-ɛnbɛn	→ tɔ-∅nbɛn	[tɔ̲nben]	‘his penis’
	b.	tɔ-ikpa	→ tɔ-∅kpa	[tɔ̲kpa]	‘mud’
	c.	tɔ-ɔtpidɔ	→ tɔ-∅tpidɔ	[tɔ̲tpidɔ]	‘armadillo’
	d.	tɔ-kutkut	→ tɔ-∅∅tkut	[tɔ̲tkut]	‘night monkey’
	e.	tɔ-womjum	→ tɔ-∅∅mjum	[tɔ̲mium]	‘banana’

The haplology process triggered by the ludlingant /tɔ-/ seems not to apply in base words starting with labial consonants:[73]

(183)	a.	wɔtɔmɔ	→ /tɔ-wotomo/	[tɔ̲wɔtɔmɔ̃]	‘tapir’
	b.	wakat	→ /tɔ-wakat/	[tɔ̲wakat]	‘alligator, cayman’
	c.	mɯda	→ /tɔ-mɯda/	[tɔ̲mɯda]	‘wait!’
	d.	mɯta	→ /tɔ-mɯta/	[tɔ̲mɯta]	‘a monkey’
	e.	muni	→ /tɔ-muni/	[tɔ̲muni][74]	‘brother’
	f.	manaŋ	→ /tɔ-manaŋ/	[tɔ̲manaŋ]	‘a coconut bug’
	g.	pɔu	→ tɔ-pɔu	[tɔ̲bou]	‘small peccary’
	h.	pɔɾat	→ tɔ-pɔɾat	[tɔ̲bɔɾat]	‘catfish’

There are similar examples, with bilabial stops, where the deletion process does apply:

[73] But there are exceptions, such as: /tɔ-womjum/ → tɔ-∅∅mjum [tɔ̲mium] ‘banana’ (see example (182e)).

[74] However, see example (181j) above, where we have the form [tɔni] for this ludling.

(184)	a.	pɯɾak	tɔɾak	‘an arrow’
	b.	pɛɾa	tɔɾa	‘a fruit’

This ludlingant, like any other, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (185) below (see Appendices 3 and 4).

(185)	a.	i-ɛnma-n 1Abs-path-Poss	tɔnman	‘my path’
	b.	k-ɔd-ɛmia-guɾugɛ-da 1Erg-Refl-hand-wash-Near	tɔdɛmiaguɾugɛda	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ 1Erg-write-Rec	tɔndɛkɛlɯ	‘I wrote it’
	d.	tɔɾik-kɔm-bɛ big-Pl-Adjr	tɔɾik-kɔm-bɛ	‘they are big’

Like the ludlings formed of two phonemes, and unlike /idi-/, the deletion here does not act over the personal and reflexive prefixes, only over the first CV syllable, as in (185b) above. And like all of the prefixed ludlings, except for /pɔ-/, the ludlingant here deletes identical vowels in a prefix:

(186)	ugu-ptʃi-n-gɔm 12Abs-leg-Poss-Pl	tɔptʃingɔm	‘our (incl.) leg’

And like all of the ludlings, /tɔ-/ also occurs in sentences.

	O	V	Oblique		
(187)	tɔ-ɾa	in-wɔ-tkɛ-lɯ	tɔ-gɔnŋɛ	tɔ-ukaɾa	bɔk
	LUD-macaw.(sp.)	1Erg-kill-Iter-Rec	LUD-yesterday	LUD-inga.tree	on
	‘I repeatedly killed macaws yesterday in the inga tree’				

	AP		S
(188)	tɔ-ɾik-kom-bɛ	(tɔ-tɔ)	tɔ-upɜ
	LUD-big-Pl-Adjr	hesitation	LUD-banana
	‘the bananas are big’		

Like the other ludlings, the ludling /tɔ-/ also shows the devoicing process of stops.

(189)	a.	piluŋɔ	tɔpiluŋɔ	‘bird hind quarter’
	b.	pɔu	tɔbɔu	‘small peccary’

And like the ludlings formed of two phonemes, there is no example with variation of voicing between the alveolar [t] and [d], and velar [k] and [g], mainly because of the deletion process over the CV syllable word-initially, such as in the following examples:

(190)	a.	takɯi	tɔkɯi	‘manioc flour’
	b.	tawɛ	tɔwɛ	‘capuchin monkey’
	c.	tamgɔ	tɔmgɔ	‘old man, grandfather’
	d.	tuktɔ	tɔktɔ	‘cultivated field’
	e.	kɯdɛn	tɔdɛn	‘cassava’
	f.	kɔʧi	tɔʧi	‘a fish’

Yet, like the other prefixed ludlings formed of two phonemes, there are examples of deletion of the palatal affricate [ʧ].

(191)	a.	ʧɛlɯ	tɔlɯ	‘sister’
	b.	ʧamit	tɔmit	‘squirrel monkey’

Like the other ludlings, the general data show that this ludling occurs with all syllable types:

(192)	a.	V	a.ɛ	tɔɛ	‘a wasp’
	b.	CV	kɯ.dɛn	tɔdɛn	‘cassava’
	c.	VC	ik.pa	tɔkpa	‘mud’
	d.	CVC	kut.kut	tɔtkut	‘night monkey’

There are homonyms in this Arara language game resulting from the addition of the ludlingant /tɔ-/ and from the phonemic processes the base words undergo.

(193)	a.	ɛmuɾu	/tɔ-ɛmuɾu/	→ tɔ-∅muɾu	[tɔmuɾu]	‘his testicles’
	b.	amuɾu	/tɔ-amuɾu/	→ tɔ-∅muɾu	[tɔmuɾu]	‘alcoholic drink’

4.2.8 Small Bird Talk

Small birds, including macaws, parrots, orange-cheeked parrots, and parakeets are, respectively, called [kaɾa (awɯ, kaɾaja, kaɾaum)], [ʧaɾɔkʧaɾɔ], [kui], and [eɾidak] in Arara. The ludling for these species of small birds is labeled in Arara [kaɾa (awɯ, kaɾaja, kaɾaum), ʧaɾɔkʧaɾɔ, kui, eɾidak pene lumbanbɔt] ‘to make the tongue of macaws, parrots, orange-cheeked parrots, and parakeets’. The morphological process used by the Arara people to build these small birds’ ludling is the addition of an /eŋna-/ prefix.

(194)	a.	nu	eŋnanu	‘abcess, tumor’
	b.	wɔt	eŋnawɔt	‘fish’
	c.	kɔk	eŋnagɔk	‘night, evening’

The phonological patterns of this ludling work almost exactly the same way as those of the prefixed ludlings already analyzed. However, it is much more similar to the

patterns of those ludlings formed of two phonemes (see these ludlings above). Thus, example (194) illustrates the ludlingant /eŋna-/ in monosyllabic words. In (195) below there are examples of this ludling attached to polysyllabic words, resulting in a haplology process: /eŋna-(C)V/ → [eŋna(∅)∅].[75] Here are some examples:

(195)	a.	ɛŋna-aɛ	→	ɛŋna-∅ɛ	[eŋnae]	'a wasp'
	b.	ɛŋna-taupa	→	ɛŋna-∅∅upa	[eŋnaupa]	'a banana'
	c.	ɛŋna-ɔɛt	→	ɛŋna-∅ɛt	[eŋnaet]	'rubber tree'
	d.	ɛŋna-abat	→	ɛŋna-∅bat	[eŋnabat]	'manioc bread'
	e.	ɛŋna-onat	→	ɛŋna-∅nat	[eŋnanat]	'corn'
	f.	ɛŋna-jɛmɛ	→	ɛŋna-∅∅me	[eŋname]	'mom, my mother'
	g.	ɛŋna-pɔmu	→	ɛŋna-∅∅mu	[eŋnamu]	'a beetle'
	h.	ɛŋna-ɔɾɛmi	→	ɛŋna-∅ɾemi	[eŋnaɾemi]	'a fish'
	i.	ɛŋna-muniŋmɔ	→	ɛŋna-∅∅niŋmɔ	[eŋnaniŋmɔ]	'my brothers'

Like the other prefixed ludlings formed of two phonemes, this ludlingant does not extend deletion to an /ɾ/-initial syllable. And like all the other (V)CV prefixed ludlings, it does not extend deletion to the coda of a vowel to be deleted.

(196)	a.	ɛŋna-ɛnbɛn	→	ɛŋna-∅nbɛn	[eŋnanben]	'his penis'
	b.	ɛŋna-ikpa	→	ɛŋna-∅kpa	[eŋnakpa]	'mud'
	c.	ɛŋna-ɔtpidɔ	→	ɛŋna-∅tpidɔ	[eŋnatpidɔ]	'armadillo'
	d.	ɛŋna-kutkut	→	ɛŋna-∅∅tkut	[eŋnatkut]	'night monkey'
	e.	ɛŋna-womjum	→	ɛŋna-∅∅mjum	[eŋnamium]	'banana'

Like /tɔ-/, the haplology process triggered by the ludlingant /eŋna-/ seems not to apply in base words starting with labial consonants:[76]

(197)	a.	muni	→	ɛŋna-muni	[eŋnamuni][77]	'brother'
	b.	matɛ	→	ɛŋna-matɛ	[eŋnamate]	'let's go!'
	c.	mɯda	→	ɛŋna-mɯda	[eŋnamɯda]	'wait!'
	d.	malɔn	→	ɛŋna-malɔn	[eŋnamalɔn]	'that's okay'
	e.	manaŋ	→	ɛŋna-manaŋ	[eŋnamanaŋ]	'a coconut bug'
	f.	piluŋɔ	→	ɛŋna-piluŋɔ	[eŋnapiluŋɔ]	'bird hind quarter'
	g.	pɔu	→	ɛŋna-pou	[eŋnabou]	'small peccary'
	h.	pɔɾat	→	ɛŋna-pɔɾat	[eŋnabɔɾat]	'catfish'

[75] There is one example of deletion of a second vowel (haplology, since it also deletes the onset of this vowel) in a monomorphemic word: /eŋna-enaɾut/ → eŋna-∅∅∅ɾut → [eŋnaɾut] 'his sister'.

[76] But there are exceptions, such as: /ɛŋna-pɔmu/ → ɛŋna-∅∅mu [eŋnamu] 'beetle' (see example (195g)) and /ɛŋna-womjum/ → ɛŋna-∅∅mjum [eŋnamium] 'banana' (see example (196e)).

[77] However, there is a form [eŋnaniŋmɔ] 'brothers' in Appendix 3. This example is in (195i).

There are similar examples, with bilabial stops, where the deletion process does apply:

(198)	a.	pɯɾak	ɛŋnaɾak	‘an arrow’
	b.	pɛɾa	ɛŋnaɾa	‘a fruit’

The ludlingant /eŋna-/, like any other, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (199) below (see Appendices 3 and 4).

(199)	a.	i-ɛnma-n 1Abs-path-Poss	ɛŋnanman	‘my path’
	b.	k-ɔd-ɛmia-guɾugɛ-da 1Erg-Refl-hand-wash-Near	ɛŋnadɛmiaguɾugɛda	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ 1Erg-write-Rec	ɛŋnandɛkɛlɯ	‘I wrote it’
	d.	tɔɾik-kɔm-bɛ big-Pl-Adjr	ɛŋnaɾik-kɔm-bɛ	‘they are big’

Like the ludlings formed of two phonemes, and unlike /idi-/, the deletion here does not act over the personal and reflexive prefixes, only over the first CV syllable, as in (199b) above. And like all of the prefixed ludlings, except for /pɔ-/, the ludlingant here deletes identical vowels in a prefix:

(200)	ugu-ptʃi-n-gɔm 12Abs-leg-Poss-Pl	eŋnaptʃingɔm	‘our (incl.) leg’

And like all of the ludlings, /eŋna-/ also occurs in sentences.

	O	V	Oblique		
(201)	ɛŋna-ɾa	in-wɔ-tkɛ-lɯ	ɛŋna-gɔnŋɛ	ɛŋna-ukaɾa	bɔk
	LUD-macaw.(sp.)	1Erg-kill-Iter-Rec	LUD-yesterday	LUD-inga.tree	on
	‘I repeatedly killed macaws yesterday in the inga tree’				

	Adv:Manner		V	Oblique: Source
(202)	ɛŋna-pɔɾɛ	tagiɛ	w-ɛbɯ-lɯ	ɛŋna-dua-n-dubɔ-p
	LUD-empty	very	1Erg-arrive-Rec	LUD-forest-Ela-Former-now
	‘I arrived from the forest without any load’			

Like the other ludlings, the ludling /eŋna-/ also shows the devoicing process of stops.

(203)	a.	piluŋɔ	eŋnapiluŋɔ	‘bird hind quarter’
	b.	pɔu	eŋnabɔu	‘small peccary’

And like the ludlings formed of two phonemes, there is no example with variation of voicing between the alveolar [t] and [d], and velar [k] and [g], mainly because of the deletion process over the CV syllable word-initially, such as in the following examples:

(204)	a.	takɯi	eŋnakɯi	‘manioc flour’
	b.	tawɛ	eŋnawɛ	‘capuchin monkey’
	c.	tamgɔ	eŋnamgɔ	‘old man, grandfather’
	d.	tuktɔ	eŋnaktɔ	‘cultivated field’
	e.	kɯdɛn	eŋnadɛn	‘cassava’
	f.	kɔʧi	eŋnaʧi	‘a fish’

Yet, like the other prefixed ludlings formed of two phonemes, there are examples of deletion of the palatal affricate [ʧ].

(205)	a.	ʧɛlɯ	ɛŋnalɯ	‘sister’
	b.	ʧamit	ɛŋnamit	‘squirrel monkey’

Like the other ludlings, the general data show that this ludling occurs with all syllable types:

(206)	a.	V	a.ɛ	ɛŋnaɛ	‘a wasp’
	b.	CV	kɯ.dɛn	ɛŋnadɛn	‘cassava’
	c.	VC	ik.pa	ɛŋnakpa	‘mud’
	d.	CVC	kut.kut	ɛŋnatkut	‘night monkey’

There are homonyms in this Arara language game resulting from the addition of the ludlingant /eŋna-/ and from the phonemic process the base words undergo.

(207)	a.	eŋna-emuru	→	eŋna-∅muru	[eŋnamuru]	‘his testicles’
	b.	eŋna-amuru	→	eŋna-∅muru	[eŋnamuru]	‘alcoholic drink’

4.2.9 Toucan Talk

Toucans are called [tɯapko] in Arara. They can also receive specific names like [pilik], [kagak] and [ʧiɾɔ]. The ludling for these species of birds is labeled in Arara [tɯapkɔ lumbanbɔt] ‘to make the tongue of the toucans’. The morphological process used by the Arara people to build the toucans’ ludling is the addition of an /eŋnaɾa-/ prefix.

(208)	a.	nu	ɛŋnaɾanu	‘abcess, tumor’
	b.	wɔt	ɛŋnaɾawɔt	‘fish’
	c.	kɔk	ɛŋnaɾagɔk	‘night, evening’

The phonological patterns of this ludling work almost exactly the same way as those of the prefixed ludlings already analyzed. However, it is much more similar to the patterns of those ludlings formed of two phonemes (see these ludlings above). Thus, example (198) illustrates the ludlingant /eŋna-/ in monosyllabic words. In (209) below there are examples of this ludling attached to polysyllabic words, resulting in a haplology process: /eŋnaɾa-(C)V/ → [eŋnaɾa∅∅].[78] Here are some examples:

(209)	a.	ɛŋnaɾa-aɛ	→ ɛŋnaɾa-∅ɛ	[eŋnaɾae]	'a wasp'
	b.	ɛŋnaɾa-taupa	→ ɛŋnaɾa-∅∅upa	[eŋnaɾaupa]	'a banana'
	c.	ɛŋnaɾa-ɔɛt	→ ɛŋnaɾa-∅ɛt	[eŋnaɾaet]	'rubber tree'
	d.	ɛŋnaɾa-abat	→ ɛŋnaɾa-∅bat	[eŋnaɾabat]	'manioc bread'
	e.	ɛŋnaɾa-ɔnat	→ ɛŋnaɾa-∅nat	[eŋnaɾanat]	'corn'
	f.	ɛŋnaɾa-jɛmɛ	→ ɛŋnaɾa-∅∅mɛ	[eŋnaɾame]	'mom, my mother'
	g.	ɛŋnaɾa-pɔmu	→ ɛŋnaɾa-∅∅mu	[eŋnaɾamu]	'a beetle'
	h.	ɛŋnaɾa-ɔɾɛmi	→ ɛŋnaɾa-∅ɾemi	[eŋaɾaɾemi]	'a fish'
	i.	ɛŋnaɾa-kuɾɔ-kuɾɔ	→ ɛŋnaɾa-∅∅ɾɔ-kuɾɔ	[eŋnaɾaɾɔkuɾɔ]	'a bird'
	j.	ɛŋnaɾa-muni	→ ɛŋnaɾa-∅∅ni	[eŋnaɾaniŋmɔ]	'my brothers'

Like the prefixed ludlings formed of two phonemes, this ludlingant does not extend deletion to an /ɾ/-initial syllable. And like all the other (V)CV prefixed ludlings, it does not extend deletion to the coda of a vowel to be deleted.

(210)	a.	ɛŋnaɾa-ɛnbɛn	→ [eŋnaɾanben]	'his penis'
	b.	ɛŋnaɾa-ikpa	→ [eŋnaɾakpa]	'mud'
	c.	ɛŋnaɾa-ɔtpidɔ	→ [eŋnaɾatpidɔ]	'armadillo'
	d.	ɛŋnaɾa-kutkut	→ [eŋnaɾatkut]	'night monkey'
	e.	ɛŋnaɾa-womjum	→ [eŋnaɾamium]	'banana'

The haplology process triggered by the ludlingant /eŋnaɾa-/, unlike /tɔ-/ and /eŋna-/ (see Sections 4.2.7 and 4.2.8), applies in base words starting with labial consonants:

(211)	a.	ɛŋnaɾa-matɛ	→ [eŋnaɾate]	'wait'
	b.	ɛŋnaɾa-manaŋ	→ [eŋnaɾanaŋ]	'a coconut bug'

[78] There is one example of deletion of a second vowel in a monomorphemic word: /ɛŋnaɾa-ɛnaɾut/ → ɛŋnaɾa-∅∅∅ɾut → [eŋnaɾaɾut] 'his sister'; and there is an example where the last vowel of the ludlingant is deleted /ɛŋnaɾa-jɔɾu/ → ɛŋnaɾa-∅∅∅ɾu → [eŋnaɾu] 'tortoise'. Here the two /ɾ/'s merge into just one, presumably due to the violation of the OCP.

c.	ɛŋnaɾa-pɯɾak	→	<u>ɛŋnaɾa</u>ɾak	‘an arrow’
d.	ɛŋnaɾa-pɛɾa	→	<u>ɛŋnaɾa</u>ɾa	‘a fruit’

This ludlingant, like the other ones, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (212) below (see Appendices 3 and 4).

(212)	a.	i-ɛnma-n 1Abs-path-Poss	<u>ɛŋnaɾa</u>nman	‘my path’
	b.	k-ɔd-ɛmia-gɯɾugɛ-da 1Erg-Refl-hand-wash-Near	<u>ɛŋnaɾa</u>dɛmiagɯɾugɛda	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ 1Erg-write-Rec	<u>ɛŋnaɾa</u>ndɛkɛlɯ	‘I wrote it’
	d.	tɔɾik-kɔm-bɛ big-Pl-Adjr	<u>ɛŋnaɾa</u>ɾik-kɔm-bɛ	‘they are big’

Like the ludlings formed of two phonemes, and unlike /idi-/, the deletion here does not act over the personal and reflexive prefixes, only over the first CV syllable, as in (212b) above. And like all of the prefixed ludlings, except for /pɔ-/, the ludlingant here deletes identical vowels in a prefix:

(213)	ugu-ptʃi-n-gɔm 12Abs-leg-Poss-Pl	<u>ɛŋnaɾa</u>ptʃingɔm	‘our (incl.) leg’

And like all of the ludlings, /ɛŋnaɾa-/ also occurs in sentences.

	O	V	Oblique		
(214)	ɛŋnaɾa-ɾa	in-wɔ-tkɛ-lɯ	ɛŋnaɾa-gɔnŋɛ	ɛŋnaɾa-ukaɾa	bɔk
	LUD-macaw.(sp.)	1Erg-kill-Iter-Rec	LUD-yesterday	LUD-inga.tree	on
	‘I repeatedly killed macaws yesterday in the inga tree’				

	Adv:Manner	V	Oblique: Source
(215)	ɛŋnaɾa-pɔɾɛ tagiɛ	w-ɛbɯ-lɯ	ɛŋnaɾa-dua-n-dubɔ-p
	LUD-empty very	1Erg-arrive-Rec	LUD-forest-Ela-Former-now
	‘I arrived from the forest without any load’		

Like the other ludlings, the ludling /ɛŋnaɾa-/ also shows the devoicing process of stops.

(216)	a.	piluŋɔ	<u>ɛŋnaɾa</u>piluŋɔ	‘bird hind quarter’
	b.	pɔu	<u>ɛŋnaɾa</u>bɔu	‘small peccary’

And like the ludlings formed of two phonemes, there is no example with variation of voicing between the alveolar [t] and [d], and velar [k] and [g], mainly because of the deletion process over the CV syllable word-initially, such as in the following examples:

(217)	a.	takɯi	ɛŋnaɾakɯi	'manioc flour'
	b.	tawɛ	ɛŋnaɾawɛ	'capuchin monkey'
	c.	tamgɔ	ɛŋnaɾamgɔ	'old man, grandfather'
	d.	tuktɔ	ɛŋnaɾaktɔ	'cultivated field'
	e.	kɯdɛn	ɛŋnaɾadɛn	'cassava'
	f.	kɔʧi	ɛŋnaɾaʧi	'a fish'

This deletion process is also true of the palatal affricate [ʧ].

(218)	a.	ʧɛlɯ	ɛŋnaɾalɯ	'sister'
	b.	ʧamit	ɛŋnaɾamit	'squirrel monkey'

Like the other ludlings, the general data show that this ludling occurs with all syllable types:

(219)	a.	V	a.ɛ	ɛŋnaɾaɛ	'a wasp'
	b.	CV	kɯ.dɛn	ɛŋnaɾadɛn	'cassava'
	c.	VC	ik.pa	ɛŋnaɾakpa	'mud'
	d.	CVC	kut.kut	ɛŋnaɾatkut	'night monkey'

There are homonyms in this Arara language game resulting from the addition of the ludlingant /eŋnaɾa-/ and from the phonemic process the base words undergo.

(220)	a.	ɛŋnaɾa-ɛmuɾu	→	ɛŋnaɾa-∅muɾu	[ɛŋnaɾamuɾu]	'his testicles'
	b.	ɛŋnaɾa-amuɾu	→	ɛŋnaɾa-∅muɾu	[ɛŋnaɾamuɾu]	'alcoholic drink'

4.2.10 Spider Monkey Talk

Spider monkeys are called [woŋoum] in Arara. The ludling for these species of monkeys is labeled in Arara [woŋoum lumbanbɔt] 'to make the tongue of the spider monkey'. The morphological process used by the Arara people to build the spider monkey's ludling is the addition of an /un-/ prefix.

(221)	a.	un-nu	unu	'abcess, tumor'
	b.	un-wɔt	unwɔt	'fish'
	c.	un-kɔk	ungɔk	'night, evening'

We can see in the data above that there is no morphophonological process when [un-] is attached to a monosyllabic word, except if the base word starts with an alveolar

consonant, as in (221a). In this case, the alveolar consonant is deleted (see below for more examples of this process). But deletion also does not occur in some polysyllabic words. For example, there is no deletion when the base word starts with /m/.[79]

(222)	a.	muni	unmuni	'brother'
	b.	mɯda	unmɯda	'wait!'
	c.	matɛ	unmatɛ	'go!'
	d.	malon	unmalon	'that's okay'
	e.	mɯdaimɔ	unmɯdaimɔ	'a fish'
	f.	muɾɛi	unmuɾɛi	'bench'
	g.	manaŋ	uŋmanaŋ[80]	'a coconut bug'

Also no deletion occurs if the ludlingant /un-/ is added to a word that starts with a closed syllable: un-(C)VC.[81]

(223)	a.	un-kutkut	→	[ungutkut]	'night monkey'
	b.	un-ɔtpidɔ	→	[unɔtpidɔ]	'armadillo'
	c.	un-ɔtkoimo	→	[unɔtkoimõ]	'armadillo'
	d.	un-ikpa	→	[unikpa]	'mud'
	e.	un-ambamba	→	[unambamba]	'sting ray'
	f.	un-ɛnbɛn	→	[unenben]	'his testicles'
	g.	un-wɔmjum	→	[unwomjum][82]	'banana'

However, some deletions occur as a result of the addition of the ludlingant /un-/ in polysyllabic words. One deletion occurs when this ludlingant is added to a word starting with an alveolar consonant. In this case, the alveolar consonant is deleted: un-$C_{[Cor]}$ → un-∅.[83]

[79] Here deletion has scope only over bilabial nasals and not over bilabial consonants in general, similar to what happens with /tɔ-/ and /eŋna-/ (see Sections 4.2.7 and 4.2.8).

[80] The form /uŋ-/, for this ludlingant, is a speaker variant.

[81] There are exceptions: /pɔtpɯɾi/ → [unbɯɾi] 'wood tick', /ɔnma/ → [unma] 'path'.

[82] The form [uŋmjum] was also attested (datum from 2010).

[83] There is one exception: /un-ʧamit/ → un-∅∅mit → [unmit] 'squirrel monkey', instead of the expected form: *[unamit].

(224)	a.	un-nu	→	un-∅u	[unu]	‘abcess, tumor’
	b.	un-tawɛ	→	un-∅awɛ	[unawɛ][84]	‘capuchin monkey’
	c.	un-napkɔ	→	un-∅apkɔ	[unapkɔ]	‘let it there’
	d.	un-ʧɛlɯ	→	un-∅ɛlɯ	[unɛlɯ]	‘sister’
	e.	un-tuktɔ	→	un-∅uktɔ	[uniktɔ][85]	‘cultivated field’
	f.	un-taupa	→	un-∅aupa	[unaupa]	‘a banana’
	g.	un-taukaɾa	→	un-∅aukaɾa	[unaukaɾa]	‘inga tree’
	h.	un-nabiɔt	→	un-∅biɔt	[unabiɔt][86]	‘sweet potato’
	i.	un-takɯi	→	un-∅akɯi	[unakɯi][87]	‘manioc flour’
	j.	un-tamgɔ	→	un-∅amgɔ	[unamgɔ]	‘old man, grandfather’

It is noteworthy that some words can be input to different phonological processes when the ludlingant /un-/ is added. For example, /nu/ ‘abcess, tumor’, as a monosyllabic word, can be an input to the deletion blocking process. At the same time, it can undergo deletion, since it is a word that starts with an alveolar consonant. As can be seen, the deletion does apply (see (221a) and (224a) above). Neither *[unnun] nor *[unːun] are attested.

Another deletion occurs when the ludlingant /un-/ is attached to a word whose first two vowels are identical, except if the first syllable has a coda (see examples in (223) above). In this case, the syllable of the first vowel is deleted (haplology): /un-(C)V_iCV_i/→ [un-∅∅CV].[88]

(225)	a.	/un-abat/	→	un-∅bat	[unbat]	‘manioc bread’
	b.	/un-ibiɾinda/	→	un-∅biɾinda	[inbiɾinda][89]	‘companion’
	c.	/un-jɛmɛ/	→	un-∅∅mɛ	[unme]	‘mom’
	d.	/un-papa/	→	un-∅∅pa	[unba]	‘dad’

[84] There also exists the form [undawe], collected at the same time (January 2003) as [unawe].

[85] Here the speaker changed the high round back vowel /u/ to /i/.

[86] The form [unbiɔt] was recorded as well. Besides deleting the vowel /a/, there is an unexpected change in the place of articulation of the nasal consonant from the prefix.

[87] The form [ungɯi] is also attested.

[88] There are exceptions such as /un-kaɾa/ → [ungaɾa] ‘macaw (spp.)’ and /un-kamap/ → [ungamap] ‘gourd container’ where no deletion occurs.

[89] The expected form was [unbiɾinda].

e.	/un-kɔkɔ/	→	un-∅∅kɔ	[ungɔ]	‘uncle’
f.	/un-ɯpɯ/	→	un-∅pɯ	[umbɯ][90]	‘yam’

It is noteworthy that the stops in (225d-f) are voiced after a nasal consonant, as occurs in the normal language (see Section 3.1.1, examples (14) and (15)). Again it is noteworthy to see that some words can be input to different phonological processes when the ludlingant /un-/ is added. For example, /manaŋ/ ‘a coconut bug’ can be an input to the blocking process or to the deletion triggered by the addition of /un-/ before a word whose first two vowels are identical. However, only the blocking process applies (see (222g) above). The form *[unanaŋ] is not attested.

It was seen that deletion is blocked in some words: monosyllabic words, words that do not start with bilabial nasal, and words that do not start with a closed syllable. It was also seen that some words undergo deletion: words that start with an alveolar consonant and words whose first two vowels are identical. For other words, their behavior is not always consistent. For example, there are some cases where no phonological process occurs even though the first two vowels of the base word are different.

(226)

a.	/un-aɛ/	[unae]	‘a wasp’
b.	/un-aɾun/	[unaɾun][91]	‘howler monkey’
c.	/un-ɔɾɛmi/	[unɔɾemi]	‘a fish’
d.	/un-ɔnat/	[unonat][92]	‘corn’
e.	/un-pɔu/	[unbou][93]	‘small peccary’
f.	/un-pɔmu/	[unbɔmu]	‘a beetle’
g.	/un-pɛɾa/	[unbeɾa]	‘a fruit’
h.	/un-pɯɾak/	[unbɯɾak]	‘an arrow’
i.	/un-pɯlɛptɛ/	[unbɯlepte]	‘knife’
j.	/un-kuɾɔkuɾɔ/	[unguɾɔkuɾɔ]	‘a bird’

[90] Here the nasal assimilates to the place of articulation of the following consonant. As can be seen from the other examples, this assimilation is not a general process among the ludlings.

[91] In the data I recorded with an elderly man the following alternative forms appear: [unum], [unɾun], and [uniɾun].

[92] The form [unat] was also attested (/un-ɔnat/ → un-∅nat → un-∅∅at).

[93] Here and elsewhere, only voiced obstruents occur after a nasal consonant (see Section 3.1.1, examples (14) and (15)).

However, similar words undergo deletion.

(227)	a.	/un-ɔɛt/	→ un-∅ɛt	[unet]	‘rubber tree’
	b.	/un-ɔmiaɛgu/	→ un-∅miaɛgu	[unmiaegu]	‘manioc bread’
	c.	/un-pɔɾat/	→ un-∅ɔɾat	[unɔɾat]	‘catfish’
	d.	/un-idua/	→ un-∅dua	[undua]	‘forest’
	e.	/un-apon/	→ un-∅pon	[unbon]	‘club’
	f.	/un-agulɯ/	→ un-∅gulɯ	[ungulɯ]	‘I ate it’
	g.	/un-kɔtʃi/	→ un-∅∅tʃi	[undʒi]	‘a fish’
	h.	/un-kɯdɛn/	→ un-∅∅dɛn	[unden]	‘cassava’

Therefore, there is no general pattern for these data, from (226) and (227) above. Other variatons by the speaker can also be found. There is a change from a back vowel to a front vowel in the prefix /un-/, either into [in-] or [en-]:

(228)	a.	/un-idamuɾu/	[indamuɾu]	‘his grandson/granddaughter’
	b.	/un-ikamabuɾu/	[ingamabuɾu]	‘a gourd container’
	c.	/un-ipun/	[inbun]	‘his/her foot’
	d.	/un-ɛmuɾu/	[enemuɾu]	‘his testicles’

Also there is an example with /i/ epenthesis:

(229)	/kutʃamit/	→ un-kutʃamit	[unitʃamit]	‘duski titi monkey’

There are examples with vowel mutation in the base word, from /e/ to [i] and /u/ to [i], respectively:

(230)	a.	/ɛnaɾut/	→ un-ɛnaɾut	[uninaɾut]	‘his sister’
	b.	/tuktɔ/	→ un-tuktɔ	[uniktɔ]	‘cultivated field’

This ludlingant, like the other ones, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (231) below (see Appendices 3 and 4).

(231)	a.	i-ɛnma-n 1Abs-path-Poss	unman	‘my path’
	b.	k-ɔd-ɛmia-guɾugɛ-da 1Erg-Refl-hand-wash-Near	undɛmiaguɾugɛda	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ 1Erg-write-Rec	undɛkɛlɯ	‘I wrote it’
	d.	kuɾɛ-p good-Adjr	unguɾɛp	‘they are big’

It can be seen above that the ludlingant /un-/ occurs word-initially in polymorphemic words, as it does in monomorphemic ones. Here the deletion process can also be

extended over two vowels word-initially. However, like the other prefixed ludlingants, this deletion process occurs only if the first vowel is part of a prefix, as in (231a) above. Similar to the other ludlings that are prefixes, except /pɔ-/, this ludlingant deletes a whole prefix when it is formed of two identical vowels:

(232) ugu-ptʃi-n-gɔm — unbɯtʃingɔm — 'our (incl.) leg'
12Abs-leg-Poss-Pl

However, in order to fit into Arara syllable structure, the stem used here is the one that occurs after a noun, *bɯtʃingɔm*, and not the one that occurs with prefixes *-ptʃingom* (see the vowel deletion process that occurs here in section 3.1.5). And like all of the ludlings, /un-/ also occurs in sentences:

	O	V	Oblique		
(233)	un-gaɾa	in-wɔ-tkɛ-lɯ	un-gɔgɔnŋɛ	un-aukaɾa	bɔk
	LUD-macaw.(sp.)	1Erg-kill-Iter-Rec	LUD-yesterday	LUD-inga.tree	on

'I repeatedly killed macaws yesterday in the inga tree'

	Adv:Manner	V	Oblique: Source
(234)	un-bɔɾɛ tagiɜ	w-ɛbɯ-lɯ	un-dua-n-dubɔ-p
	LUD-empty very	1Erg-arrive-Rec	LUD-forest-Ela-Former-now

'I arrived from the forest without any load'

As seen above (231d-h), all obstruents are voiced after the ludlingant /un-/. Here are some more examples:

(235)	a.	un-papa	unba	'dad'
	b.	un-kɔkɔ	ungɔ	'old man, grandfather'
	c.	un-ɯpɯ	[umbɯ][94]	'yam'
	d.	un-kɔtʃi	undʒi	'a fish'

The general data show that the present ludling occurs with all syllable types:

(236)	a.	V	a.ɛ	unaɛ	'a wasp'
	b.	CV	pɯ.ɾak	unbɯɾak	'an arrow'
	c.	VC	ik.pa	unikpa	'mud'
	d.	CVC	kut.kut	ungutkut	'night monkey'

[94] Here the nasal assimilates to the place of articulation of the following consonant. As can be seen from the other examples, this assimilation is not a general process in the ludlings.

4.2.11 Squirrel Monkey Talk

Squirrel monkeys are called [ʧamit] in Arara. The ludling for these species of monkeys is called in Arara [ʧamit lumbanbɔt] 'to make the tongue of a squirrel monkey'. The morphological process used by the Arara people to build the squirrel monkey's ludling is the addition of an infix /-pt-/ after the first vowel of the base word.

(237)	a.	nu	nuptu	'abcess, tumor'
	b.	wɔt	wɔptɔt	'fish'
	c.	kɔk	kɔptɔk	'night, evening'

As seen above, when the ludlingant [-pt-] is inserted into a monosyllabic word, the vowel from the syllable nucleus is repeated after the addition of the infix. This seems to happen so that the output forms can accommodate Arara syllable structure. Without this repetition these output forms would present consonant clusters, such as *nupt, *wɔptt, and *kɔptk, respectively, not licensed by the CVC Arara canonical pattern.

When this ludlingant occurs in words with a vowel sequence in the two first syllables, it simply separates the two vowels: /(C)VV(C)/ → [(C)V-pt-V(C)].

(238)	a.	aɛ	a-pt-ɛ	[apte]	'a wasp'
	b.	ɔɛt	ɔ-pt-ɛt	[ɔptet]	'rubber tree'
	c.	pɔu	pɔ-pt-u	[poptu]	'small peccary'
	d.	taupa	ta-pt-upa	[taptupa][95]	'a banana'

If the first vowel in the word is followed by a consonant, the ludlingant replaces this consonant: /(C)V-C-V(C)/ → [(C)V-pt-V(C)].

(239)	a.	/kɔkɔ/	→	kɔ-pt-ɔ	[kɔptɔ]	'my uncle'
	b.	/jɛmɛ/	→	jɛ-pt-ɛ	[jepte]	'mom'
	c.	/papa/	→	pa-pt-a	[papta]	'dad'
	d.	/abat/	→	a-pt-at	[aptat]	'manioc bread'
	e.	/ʧɛlɯ/	→	ʧɛ-pt-ɯ	[ʧɛptɯ]	'sister'
	f.	/ɔrɛmi/	→	ɔ-pt-ɛmi	[ɔptemi]	'a fish'
	g.	/ɔnat/	→	ɔ-pt-at	[ɔptat]	'corn'
	h.	/pitɔt/	→	pi-pt-ɔt	[piptɔt]	'a fruit'
	i.	/mɯda/	→	mɯ-pt-a	[mɯpta]	'wait!'

[95] This example is in Appendix 3, example (12), line C. In that appendix, in the sentence section, example (20), line C, the speaker gave the form [taupta], with the ludlingant after the second vowel.

If there are two consonants following the vowel, both of them will be replaced by the ludlingant /-pt-/. Thus we can have /(C)V-CC-V(C)/ → [(C)V-pt-V(C)], as can be seen in the examples below.

(240)	a.	/ɛnbɛn/	→ ɛ-pt-ɛn	[epten]	'his penis'
	b.	/ɔnma/	→ ɔ-pt-a	[opta]	'path'
	c.	/ɔtpa/	→ ɔ-pt-a	[opta]	'a fish'
	d.	/ikpa/	→ i-pt-a	[ipta]	'mud'
	e.	/tamgɔ/	→ ta-pt-ɔ	[taptɔ]	'old man, grandpa'
	f.	/kutkut/	→ ku-pt-ut	[kuptut]	'night monkey'

There are other examples that support this hypothesis. Similar, but not identical to /idi-/ (see Section 4.2.2, example (118)), if the next consonant in the sequence of phonemes is a flap and the vowel following the flap is identical to the one before it, the replacement extends until the flap: /(C)V-CV$_i$ɾ-V$_i$/ → [(C)V-pt-V$_i$].

(241)	a.	/ibiɾinda/	→ i-pt-inda	[iptinda]	'companion'
	b.	/ibaɾa/	→ i-pt-a	[ipta]	'nothing'
	c.	/amuɾu/	→ a-pt-u	[aptu]	'alcoholic drink'

The only other ludlingant that causes this kind of deletion is /idi-/, for duski titi monkeys talk (see Section 4.2.2). On the other hand, a palatal affricate does not delete.

(242)	a.	/kɔtʃi/	→ kɔ-pt-tʃi	kɔ-p∅-tʃi	[kɔptʃi]	'a fish'
	b.	/ɛmtʃin/	→ ɛ-pt-tʃin	ɛ-p∅-tʃin	[eptʃin]	'his daughter'

Since the lundlingant /-pt-/ ends in an alveolar stop, and the contiguous affricate begins with a similar stop, the OCP is violated with a consequent deletion of the alveolar stop from the ludlingant (for OCP see Section 3.1.5). This is the only example of a ludlingant undergoing a phonemic process. However, there is an example where the affricate is replaced.

(243)	ugu-ptʃi-n-gɔm	→ ugu-pt-ingɔm	[uguptingom]	'our (incl.) leg'
	12Abs-leg-Poss-Pl			

Different from the normal language, this ludling does not palatalize an alveolar stop before the vowel /i/ (see Section 3.1.1, examples (7b and c)).

(244)	a.	/ɔtpidɔ/	→ ɔ-pt-idɔ	[ɔptidɔ]	'armadillo'
	b.	/ɔmiaɛgu/	→ ɔ-pt-iaɛgu	[optiaɛgu]	'a fish'

c.	/wɔmjum/	→	wɔ-pt-ium	[wop<u>t</u>ium]	‘banana’
d.	/nabiɔt/	→	na-pt-iɔt	[na<u>pt</u>iɔt]	‘sweet potato’
e.	/ibiɾinda/	→	i-pt-inda	[i<u>pt</u>inda]	‘companion’
f.	/ibin/	→	i-pt-in	[i<u>pt</u>in]	‘her brother’
g.	/ibit/	→	i-pt-it	[i<u>pt</u>it]	‘her younger sister’

The ludlingant [-pt-] has other variants, such as [-kt-] and [-tt-].

(245)	a.	/ɯun/	→	ɯ-kt-un	[ɯ<u>kt</u>un]	‘my food’
	b.	/ugɔngɔm/	→	u-kt-ɔngɔm	[u<u>kt</u>ɜngom][96]	‘men’
	c.	/itutun/	→	i-tt-un[97]	[i<u>t</u>ːun]	‘her vagina’

Other variants seem to be systematic, being allomorphs of [-pt-]. One of them is [-ht-], which occurs in few a words that have an alveolar consonant, such as /d/, /l/, /n/, and /t/, following the first vowel of the base word:[98]

(246)	a.	/matɛ/	→	ma-ht-ɛ	[ma<u>ht</u>e]	‘let’s go!’
	b.	/kɯdɛn/	→	kɯ-ht-ɛn	[kɯ<u>ht</u>en]	‘cassava’
	c.	/malɔn/	→	ma-ht-ɔn	[ma<u>ht</u>ɔn][99]	‘that’s ok’
	d.	/muni/	→	mu-ht-i	[mu<u>ht</u>i][100]	‘brother’

But as can be seen above (example (239e-i)), alveolar consonants, such as /l/, /ɾ/, /n/, /t/, and /d/, are also replaced by the form /-pt-/. One other variant is that the voiced coronal stop /d/ also occurs replacing alveolar consonants, such as /ɾ/ and /l/.

(247)	a.	/aɾun/	→	a-d-un	[a<u>d</u>un]	‘howler monkey’
	b.	/jɔɾu/	→	jɔ-d-u	[jɔ<u>d</u>u]	‘tortoise’
	c.	/malon/	→	ma-d-on	[ma<u>d</u>on][101]	‘that’s okay’

Here the alveolar consonants are liquids. But as was seen, there are liquids which are replaced by the form /-pt-/ as well (see (239e and f)). Again the motivation to the

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[96] Here the speaker used [ɜ] instead of [o].

[97] In this example an extra syllable deletes. The expected form is [iptutun]. This is the only example where the OPC violation does not result in deletion from the first consonant onward.

[98] However, there are examples where alveolar consonants are replaced by [-pt-], such as /mate/ → [ma<u>pt</u>e] ‘you can go’, /wɔtɔmɔ/ → [wɔ<u>pt</u>ɔmõ] ‘tapir’, /ɛduɛt/ → [eptuet] ‘his/her hammock’, /manaŋ/ → [maptaŋ] ‘a coconut bug’.

[99] The form [madon] was also attested (see example (247c) below).

[100] In Appendix 3, example (10), line C, there also exists the form [mu<u>pt</u>iŋmɔ] ‘brothers’.

[101] The form [ma<u>ht</u>ɔn] was also attested (see example (246c)).

replacement triggered by the form /-d-/ instead of /-pt-/ seems not to be phonemic. There are also examples where two replacements take place within a word:

(248)	a.	/i-ɛnaɾut/ 1Abs-sister	→ iɛ-pt-a-d-ut	[ieptadut]	‘my (man) sister’
	b.	/i-manɔ/ 3Abs-brother	→ i-pt-a-d-ɔ	[iptadɔ]	‘his younger brother’

In this case, the first replacement is with /-pt-/, which replaces the consonant that follows the first syllabic nucleus of the base word; the second replacement is with the segment /-d-/, which replaces the alveolar sonorant that follows the second vowel of the base word. It is not clear when the form /-d-/ has a primary or a secondary role.

The data presented so far are mainly monomorphemic. But this ludlingant, like the other ones, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (249) below (see Appendices 3 and 4).

(249)	a.	i-ɛnma-n 1Abs-path-Poss	iɛ-pt-an	‘my path’
	b.	k-ɔd-ɛmia-guɾugɛ-da 1Erg-Refl-hand-wash-Near	kɔ-pt-ɛmiaguɾugɛda	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ 1Erg-write-Rec	i-pt-ɛkɛlɯ	‘I wrote it’
	d.	wɯɾɯp-pɛ bad-Adjr	wɯ-pt-ɯpɛ	‘it is bad’

It can be seen above that the ludlingant /-pt-/ occurs in polymorphemic words, as it does in monomorphemic ones, i.e., after the first syllabic nucleus of the base word. In this sense, a vocalic sequence can be read as one vocalic cluster, if the first vowel of this sequence is a prefix. If this first vowel is part of the stem, it is not considered a cluster together with the following vowel (see example (238) above). Similarly to the other ludlings, except for /pɔ-/, this ludlingant treats a prefix formed by two identical vowels as one whole, being added after the last vowel of the prefix:

(250) ugu-ptʃi-n-gɔm ugu-pt-ingɔm ‘our (incl.) leg’
12-Abs-leg-Poss-Pl

And like all of the ludlings, /-pt-/ also occurs in sentences:

	O	V	Oblique		
(251)	ka-pt-a	in-wɔ-tkɛ-lɯ	kɔ-pt-ɔnŋɛ	tau-pt-a[102]	bɔk
	ma-LUD-caw.(sp.)	1Erg-kill-Iter-Rec	yes-LUD-terday	inga-LUD-tree	on

‘I repeatedly killed macaws yesterday in the inga tree’

	Adv:Manner	V	Oblique: Source
(252)	ta-pt-ɔrɜ tagiɛ	w-ɛbɯ-lɯ	i-pt-ua-n-dubɔ-p
	em-LUD-pty very	1Erg-arrive-Rec	for-LUD-est-Ela-Former-now

‘I arrived from the forest without any load’

Like the other ludlings, the general data show that this ludling occurs with all syllable types:

(253)	a.	V	a.ɛ	aptɛ	‘a wasp’
	b.	CV	kɯ.dɛn	kɯhtɛn	‘cassava’
	c.	VC	ik.pa	ipta	‘mud’
	d.	CVC	kut.kut	kuptut	‘night monkey’

There are homonyms in this Arara language game resulting from the addition of the ludlingant /-pt-/ and from the phonemic process the base words undergo.

(254)	a.	/ɔnma/	→ ɔ-pt-a	[ɔpta]	‘path’
	b.	/ɔtpa/	→ ɔ-pt-a	[ɔpta]	‘a fish’
(255)	a.	/ikpa/	→ i-pt-a	[ipta]	‘mud’
	b.	/ibaɾa/	→ i-pt-a	[ipta]	‘nothing’

4.2.12 Howler Monkey Talk

Howler monkeys are called [aɾun] in Arara. The ludling for this species of monkeys is labeled in Arara [aɾun lumbanbɔt] ‘to make the tongue of a howler monkey’. The linguistic process the Arara people use to build the howler monkey’s ludling is phonological, i.e., the placement of nasalization on the vowels of the base words:

[102] The expected form is [taptupa] (see Appendix 3, example (352d)).

		Base Language		Ludling		English Gloss
(256)	a.	nu	→	/nu, [nas]/	[nũʔ][103]	‘abcess, tumor’
	b.	wɔt	→	/wɔt, [nas]/	[wɔ̃t]	‘fish’
	c.	kɔk	→	/kɔk, [nas]/	[kɔ̃k]	‘night’
	d.	aɛ	→	/aɛ, [nas]/	[ãɛ̃]	‘a wasp’
	e.	kɯdɛn	→	/kɯdɛn, [nas]/	[kɯ̃dɛ̃n]	‘manioc flour’
	f.	ikpa	→	/ikpa, [nas]/	[ĩkpã]	‘mud’
	g.	kutkut	→	/kutkut, [nas]/	[kũtkũt]	‘night monkey’
	h.	abat	→	/abat, [nas]/	[ãbãt]	‘manioc bread’
	i.	eduɛt	→	/eduɛt, [nas]/	[ẽdũɛ̃t]	‘hammock’
	j.	jɔɾu	→	/jɔɾu, [nas]/	[jõɾũ]	‘tortoise’
	k.	ɯpɯ	→	/ɯpɯ, [nas]/	[ɯ̃pɯ̃]	‘yam’

To my ear, the nasalization here is slighltly weaker than the (allophonic) nasalization that occurs on a vowel after a nasal consonant and before silence (see Section 3.1.1).

This ludlingant, like the other ones, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (257) below (see Appendices 3 and 4).

(257)	a.	i-ɛnma-n, [nas] 1Abs-path-Poss, LUD	[ĩẽnmãn]	‘my path’
	b.	k-ɔd-ɛmia-guɾugɛ-da, [nas] 1Erg-Refl-hand-wash-Near, LUD	[kɔ̃dẽmĩãgũɾũgẽdã]	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ, [nas] 1Erg-write-Rec, LUD	[ĩndẽkẽlɯ̃]	‘I wrote it’
	d.	wɯɾɯp-pɛ, [nas] big-Adjr, LUD	[wɯ̃ɾũpẽ]	‘it is bad’

Besides occurring in polymorphemic words, like all of the ludlingants, this ludlingant occurs in sentences:

		O	V	
(258)	a.	kãɾã macaw.(sp.), LUD	ĩn-wɔ̃-tkɛ̃-lɯ̃ 1Erg-kill-Iter-Rec, LUD	
		Oblique		
	b.	kɔ̃gɔ̃nŋɛ̃ yesterday, LUD	tãũkãɾã inga.tree, LUD	bɔ̃k on, LUD
		‘I repeatedly killed macaws yesterday in the inga tree’		

[103] CV content monosyllabic words in Arara are very rare. When they are spoken in isolation, a final glottal stop is added.

	Adv:Manner		V	Oblique: Source
(259)	tãpɔ̃ɾɛ̃	tãgĩɛ̃	w̃-eɛ̃bũ-lũ	ĩdũã-n-dũbɔ̃-p
	empty, LUD	very, LUD	1Erg-arrive-Rec, LUD	forest-Ela-Former-now, LUD
	'I arrived from the forest without any load'			

As can be seen above, the nasalization spreads across the whole utterance. Since this ludling spreads nasalization over a whole utterance, it occurs with all syllable types from the base languge:

(260)	a.	V	a.ɛ	ãɛ̃	'a wasp'
	b.	CV	kɯ.dɛn	kũdɛ̃n	'cassava'
	c.	VC	ik.pa	ĩkpã	'mud'
	d.	CVC	kut.kut	kũtkũt	'night monkey'

4.2.13 Tortoise Talk

Tortoise are called [joɾu] in Arara. The ludling for this species of animals is labeled in Arara [joɾu lumbanbot] 'to make the tongue of a tortoise'. There is no morphological process to form this ludling. Instead, there are two phonological processes used by the Arara people to build the tortoise's ludling: murmuring the whole base word, plus lowering and/or fronting the first vowel, some vowels, or even all the vowels. In this case, the optimal vowel to be achieved in Arara is [æ], which is at the same time the most advanced and the lowest vowel. It is interesting to note that this vowel is not part of the Arara phonemic inventory. Here are some examples:

(261)	a.	nu	→ [næ] (murmured)	'abcess, tumor'
	b.	kɔk	→ [kak] (murmured)	'night'
	c.	aɛ	→ [æɛ] (murmured)	'a wasp'
	d.	ikpa	→ [ikpæ] (murmured)	'mud'
	e.	abat	→ [æbæt] (murmured)	'manioc bread'
	f.	kɯdɛn	→ [kedæn] (murmured)	'cassava'
	g.	kɔkɔ	→ [kækæ] (murmured)	'my uncle'
	h.	muni	→ [mɔnɪ] (murmured)	'brother'
	i.	kutkut	→ [kækæt] (murmured)	'night monkey'
	j.	ʧɛlɯ	→ [ʧæle] (murmured)	'sister'
	k.	ɛmuɾu	→ [ɛmʊɾʊ] (murmured)	'his testicles'

This ludlingant, like the other ones, can occur within polymorphemic words, such as nouns, verbs, and adjectives, as can be seen in (262) below (see Appendices 3 and 4).

(262)	a.	i-ɛnma-n 1Abs-path-Poss, LUD	[iænmæn] (Mur)	‘my path’
	b.	k-ɔd-ɛmia-gurugɛ-da 1Erg-Refl-hand-wash-Near, LUD	[kædæmiægɛrɛgɛdæ] (Mur)	‘I am going to wash my own hand (near)’
	c.	in-dɛkɛ-lɯ 1Erg-write-Rec, LUD	[indækælæ] (Mur)	‘I wrote it’
	d.	wɯrɯp-pɛ big-Adjr, LUD	wæræpæ (Mur)	‘it is bad’

Besides occurring in polymorphemic words, like all of the ludlingants, this ludlingant occurs in sentences:

		O	V
(263)	a.	kæræ macaw.(sp.), LUD	in-wa-tkɛ-lɛ 1Erg-kill-Iter-Rec, LUD
		Oblique	
	b.	kɛgɛnŋɛ tæukæræ bɛk (Mur) yesterday, LUD inga.tree, LUD on, LUD	
		‘I repeatedly killed macaws yesterday in the inga tree’	

	Adv:Manner		V	Oblique: Source
(264)	tæpɛræ	tægiɛ	w-æbɛ-lɛ	ɛduaæ-n-dubɛ-p (Mur)
	empty, LUD	very, LUD	1Erg-arrive-Rec, LUD	forest-Ela-Former-now, LUD
	‘I arrived from the forest without any load’			

As can be seen above, this ludlingant spreads across the whole utterance. Since this ludling spreads frontness and murmuring over a whole utterance, it occurs with all syllable types from the base language:

(265)	a.	V	a.ɛ	æɛ	‘a wasp’
	b.	CV	kɔ.kɔ	kækæ	‘my uncle’
	c.	VC	ik.pa	ikpæ	‘mud’
	d.	CVC	kut.kut	kætkæt	‘night monkey’

4.3 Summary of the Ludlings

In the Arara ludling constructions surveyed above, the most frequently used strategy is to add prefixes to the base words, in a total of nine out of thirteen cases. Among the other four strategies, two involve the addition of an infix, one the addition of nasalization, and the last one the lowering and fronting of vowels, as well as murmuring. Below a

summary of all the ludlings described above is presented, with /abat/ ‘manioc bread’ as the base word.

		abat	**‘manioc bread’**
(266)	a.	[abagat]	‘capuchin monkey’
	b.	[idibat]	‘duski titi monkey’
	c.	[wibat]	‘large birds: chicken, muscovy duck, Brazilian merganser, guan, and curassow’
	d.	[pɔbat]	‘trumpeter and woodpecker’
	e.	[nɯbat]	‘coati’
	f.	[pibat]	‘agouti’
	g.	[tɔbat]	‘peccary and dog’
	h.	[eŋnabat]	‘small birds: macaw, parrot, orange-cheeked parrot, and parakeet’
	i.	[eŋnarabat]	‘toucan’
	j.	[unbat]	‘spider monkey’
	k.	[aptat]	‘squirrel monkey’
	l.	[ãbãt]	‘howler monkey’
	m.	[æbæt] (murmured)	‘tortoise’

A summary of some of the phonological processes triggered by the addition of the ludlingants to the base language forms is also presented. Some of these processes include voice-voiceless contrast, neutralization of a voicing contrast, haplology, and quasi-absence of haplology.

(267)	Voice-Voiceless Contrast	Neutralization of Voicing Contrast	Haplology		Few Haplology
	idi- wi- pɔ- nɯ- pi- tɔ- eŋna- eŋnara-	un-	wi- pɔ- nɯ- pi- tɔ- eŋna- eŋnara-	idi-	un-

Ludlingant prefixes ending in a vowel show contrast among voice and voiceless stops at the beginning of the following root. The ludlingant prefix ending in a nasal consonant (/un-/) neutralizes this contrast, as can be seen in the first two columns in the chart above. Ludlingants ending in a vowel, except /idi-/, trigger haplology. The ludlingant ending in a

nasal consonant (/un-/), with rare exceptions, does not feed haplology. The ludlingant /idi-/ does not trigger haplology like the other ludlingant prefixes ending in a vowel do. However, it has more examples triggering haplology than /un-/ does. To show this, it is placed between the column that causes haplology and the one which usually does not. The other ludlingants are not crucial for these phonological processes.

CHAPTER 5

CONCLUSION

In this thesis I have described thirteen different ludlings extant in the Arara language. As can be seen, they are used only by some elderly Arara people living in the village of Laranjal. And despite their large number, the ludlings fulfill a very restricted sociolinguistic purpose: speaking to pets.

All ludlingants seem to occur with different word classes of the Arara base language. There is even an example of /-gV-/ in an auxilary word: *kɔgɜlone nitʃagah* 'leave it for tomorrow'. In future research I intend to directly attempt to elicit ludlings in conjunction with functional parts of speech such as postpositions, interjections, etc.

Based on the descriptions presented in this thesis, the ludlingants can be grouped in six different ways:

(V)CV-	un-	-gV-	-pt-	nasalization	fronting/murmuring

The first form above includes all of the prefixes except /un-/: /idi-/, /wi-/, /pɔ-/, /nɯ-/, /pi-/, /tɔ-/, /eŋna-/, and /eŋnara-/. These eight prefixes are grouped together because they form a specific ludling class that shares a similar deletion process triggered on the stems of the base language. The addition of the other five types of ludlingants also triggers deletion and other phonological processes on the stems of the base language. Some of these processes include copying of vowels, nasalization, murmur, and lateralization of taps.

Sherzer (1982) claims that there are similarities and differences among the linguistic structures of play languages vs. ordinary languages. In Arara, these similarities include stress, syllable patterns, word order, ergativity, restrictions on consonant occurrence, etc. For the sake of illustration, the addition of the ludlingant /-pt-/ on monosyllabic words, such as /nu/, /wɔt/, and /kɔk/, would result in the unacceptable forms *nupt, *wɔptt, and *kɔptk, respectively. However, for these forms to accommodate the canonical Arara syllable pattern, the vowel from the syllable nucleus is copied directly after the ludlingant /-pt-/, resulting in /nuptu/, /wɔptɔt/, and /kɔptɔk/, respectively. Another example is the use of the allomorph *bɯtʃingɔm* 'our (incl.) leg' instead of the allomorph *-ptʃingɔm*. Using the latter would result in a sequence of three consonants, *[nptʃ] and the consequently unacceptable form **unptʃingɔm*, which violates Arara syllable structure. However, the use of the first allomorph produces the acceptable form [unbɯtʃingɔm]. In addition to this, the ludling for capuchin monkeys has the same child speech substitution of a flap for a lateral, such as in /jɔɾu/ → [jɔlu] 'tortoise' (as stated above it was through this similarity that I came to know about these Arara ludlings).

Another important conclusion is that the Arara ludlings are different from the base language. For example, the alveolar stop of the ludlingant /-pt-/, used to address squirrel monkeys, does not undergo palatalization before the vowel /i/, as occurs in the base language. This can be illustrated with the base word /ibiɾinda/ 'companion', which after the addition of the ludlingant is realized as [iptinda], not *[iptʃinda]. Furthermore, in the normal Arara language there is no front low vowel [æ]. However, in the tortoise ludling this is the optimal vowel to be achieved.

Perhaps the Arara ludlings were developed in the early Arara culture because in their mythic past, animals played an important part, the capuchin monkey being the most

important. He did many things as the Arara mythic hero, including transforming the kapok tree branches into manioc and transforming a vine nodule into his younger brother. He and his younger brother are referred to as [pamdaŋmɔ], for which name I do not have a translation. I only know that the suffix [-ŋmɔ] marks the plural form. The agouti was the sister of the capuchin monkey; the tapir was his relative; the vulture was his friend.

In the mythic past, it was believed that the Arara people reproduced through eggs, like birds do. But Pamdaŋmɔ made them understand that there was another way. So it is not a surprise that the Arara people are extremely connected to their pets, even to the point of inventing a specialized way to address them.

APPENDICES

Appendix 1

Contrast Among Consonants

- [p] and [b]:

(1) a. [ɯpɯ] 'yam'
b. [ɯbɯ] 'stone'

(2) a. [tapɔɾe] 'without load/baggage'
b. [tabɔɾe] 'open arm/wing'

- [p] and [m]:

(3) a. [ɔɾepi] 'bare-faced curassow'
b. [ɔɾemĩ] 'a fish'

(4) a. [pɔbu] 'a palm tree'
b. [mɔbu] 'mahogany, canoe'

- [p] and [w]:

(5) a. [maɾapa] 'paddle'
b. [kaɾawa] 'manioc root'

(6) a. [peɾa] 'a wild fruit'
b. [weɾɔ] 'wild cat'

- [b] and [m]:

(7) a. [ibit] 'her younger sister'
b. [imit] 'its root'

(8) a. [ɯbɯ] 'stone'
b. [imɯ] 'his/her father'

- [b] and [w]:

(9) a. [ibet] 'his/her leg'
b. [iwet] 'his/her excrement'

(10) a. [abelɯ] 'it dried'
b. [ewelɯ] 'his/her necklace'

- [m] and [n]:

(11) a. [mɔk] ‘that one (animate)’
b. [nɔk] ‘who?’

(12) a. [imun] ‘his son’
b. [inun] ‘his/her kidney’

(13) a. [mumbɔ] ‘a wild fruit’
b. [munbɔ] ‘rat, mouse’

(14) a. [ɔgum] ‘wasp’
b. [ugɔn] ‘man’

- [m] and [ŋ]:

(15) a. [emuɾu] ‘his testicles’
b. [eŋuɾu] ‘his/her eye’

(16) a. [inmɛ] ‘s/he does not want/like it’
b. [inŋɛ] ‘it is sour’

(17) a. [imɯ] ‘his/her father’
b. [ɯŋɯ] ‘grub, larva’

- [m] and [w]:

(18) a. [mɔk] ‘that one (animate)’
b. [wɔk] ‘a medicinal vine’

(19) a. [amɯ] ‘head louse’
b. [awɯ] ‘blue-and-yellow macaw’

- [t] and [d]:

(20) a. [mɯta] ‘monkey’
b. [mɯda] ‘wait!’

(21) a. [kaɾatɔ] ‘gourd container’
b. [aɾadɔ] ‘bamboo’

- [t] and [ʧ]:

(22) a. [mɯta] ‘monkey’
b. [mɯʧaŋ] ‘skin ulcer’

(23) a. [kaɾaʧu] ‘spoon’
b. [kajatu] ‘peach fronted parakeet’

- [t] and [n]:

(24) a. [mɯta] ‘monkey’
b. [mɯna] ‘over there (in that direction)’

(25) a. [tuna] ‘a proper name for a boy’
b. [nunɔ] ‘moon’

(26) a. [iput] ‘his/her hair’
b. [ipun] ‘his/her foot’

- [t] and [ɾ]:

(27) a. [kutɔ] ‘a toad’
b. [uɾɔ] ‘I’

(28) a. [kutɯ] ‘a proper name for a woman’
b. [juɾɯ] ‘puddle’

- [t] and [l]:

(29) a. [patɯt] ‘porcupine, coendou’
b. [alɯ] ‘core, the one from inside’

(30) a. [tagat tagat] ‘flute (type of)’
b. [lagat] ‘lizard’

- [d] and [n]:

(31) a. [idun] ‘his/her jealousy’
b. [inun] ‘his/her liver’

(32) a. [amdet] ‘handle, strap’
b. [amnet] ‘blood vessel, vein’

- [d] and [ɾ]:

(33) a. [adɔ] ‘fish’
b. [aɾɔ] ‘his, her lung’

(34) a. [adɯlɯ] ‘s/he tore it’
b. [aɾɯlɯ] ‘s/he looked at it’

- [d] and [l]:

(35) a. [adɯ] ‘a small wild fruit’
b. [alɯ] ‘core, the one from inside’

(36) a. [waɾada] ‘a honey’
b. [waɾala] ‘a palm tree’

- [ʧ] and [j]:

(37) a. [kaɾaʧu] ‘spoon’
b. [kuɾuju] ‘small gourd container’

(38) a. [ʧaga] ‘food cooked in palm leaves’
b. [jɔgɔ] ‘bee’

- [ʧ] and [ɾ]:

(39) a. [mɯʧaŋ] ‘skin ulcer’
b. [juɾan] ‘pepper’

(40) a. [kaɾaʧu] ‘spoon’
b. [tuɾu] ‘a tree’

- [n] and [ŋ]:

(41) a. [manan] ‘a herbaceous plant’
b. [manaŋ] ‘a coconut bug’

(42) a. [ʧanɔ] ‘a poison’
b. [wɔŋɔ] ‘game, meat’

(43) a. [aŋna] ‘mortar’
b. [onŋon] ‘cacao’

- [n] and [ɾ]:

(44) a. [pɔnat] ‘a palm tree’
b. [pɔɾat] ‘catfish’

(45) a. [ɔnon] ‘barbasco plant’
b. [ɔɾɔt] ‘wild cashew’

- [l] and [ɾ]:

(46) a. [ilu] ‘his/her tongue’
b. [iɾu] ‘his older brother’

(47) a. [walɔ] ‘a hawk’
b. [aɾɔ] ‘lung’

- [k] and [g]:

(48) a. [akulɯ] ‘it darkened’
b. [agulɯ] ‘he ate it’

(49) a. [wakat] ‘alligator, cayman’
b. [waga] ‘vulture’

- [g] and [ŋ]:

(50) a. [eguɾu] ‘its stain, spot’
b. [eŋuɾu] ‘his/her eye’

(51) a. [agoŋ] ‘graze it, clear it (field)!’
b. [aŋon] ‘fallen on the ground (fruit)’

- [g] and [w]:

(52) a. [tagi] ‘cricket’
b. [pawi] ‘curassow’

(53) a. [egɯ] ‘throat, cartilage from the curassow's throat to its anus’

b. [awɯ] ‘blue-and-yellow macaw’

Appendix 2

Contrast Among Vowels

- [i] and [e] (and [ɛ])

(1) a. [kubi] ‘a fish’
b. [kube] ‘arrow (type of)’

(2) a. [itkɔ] ‘lay down!’
b. [etkɔ] ‘take it, catch it!’

(3) a. [eɾin] ‘an insect’
b. [ɛɾɛn] ‘his/her liver’

(4) a. [ibit] ‘her younger sister’
b. [ibet] ‘his/her leg’

- [i] and [ɯ]

(5) a. [pawi] ‘curassow’
b. [awɯ] ‘blue-and-yellow macaw’

(6) a. [ibit] ‘her younger sister’
b. [ibɯt] ‘his wife’

(7) a. [niba] ‘let him/her take a bath’
b. [nɯba] ‘let him/her give him/her a bath’

(8) a. [ibɯɾɯ] ‘his arrow’
b. [ɯbɯɾɯ] ‘my arrow’

- [u] and [ɔ]

(9) a. [kutkut] ‘monkey’
b. [kɔtkɔt] ‘bird’

(10) a. [ɔgum] ‘wasp’
b. [ɔgɔm] ‘blind-snake’

(11) a. [kui] ‘a parakeet’
b. [koi] ‘leaf that dogs eat to become brave’

(12) a. [tudɔ] ‘an awl’
b. [tɔdɔ] ‘leporinus fish’

- [u] and [ɯ]

(13)	a.	[ɯwɛlu]	‘my flashlight’
	b.	[ɯwɛlɯ]	‘my necklace’
(14)	a.	[imu]	‘its egg’
	b.	[imɯ]	‘his/her father’
(15)	a.	[muaŋ]	‘an insect’
	b.	[mɯaŋ]	‘a fish’

- [a] and [e] (or [ɛ])

(16)	a.	[kuba]	‘an armadillo’
	b.	[kube]	‘an arrow’
(17)	a.	[pawi]	‘curassow’
	b.	[pɛwit]	‘a hawk’
(18)	a.	[amuɾu]	‘manioc beer’
	b.	[ɛmuɾu]	‘his testicles’

- [a] and [ɔ]

(19)	a.	[waga]	‘vulture’
	b.	[wagɔ]	‘a sloth’
(20)	a.	[pɯɾak]	‘arrow (with four points)’
	b.	[pɯɾɔk]	‘a parakeet’
(21)	a.	[taɾik]	‘big’
	b.	[tɔɾik]	‘several’

Appendix 3

Chart with Ludlings

In this appendix I present examples of ludling data in three large charts, with all ludlingants using the same base words or sentences, to show all ludlings present in the Arara language. I obtained these data through a broad phonetic transcription that I made in 2010 on location in Laranjal village (see Chapter one and Chapter two). I recorded the data from Tjimi Arara, a 73 year old male, after being authorized by him to do so. Since he does not know how to read or write, I read aloud an Informed Consent document to him. He agreed with the terms presented in the document and impressed his thumbprint on it. We had several meetings. In the process of eliciting these data, I told him a base word or a base sentence and asked him to say each ludling for that word or sentence. I repeated the base word or sentence each time he was going to say a ludling. So these big charts are formed from elicited data. Consequently, a few variations in the speaker's pronounciation were attested in this material, such as for the word 'tree', which seems not to follow any pattern. I did not record these charts electronically, as I did for Appendix 4. For each base word or sentence in the charts, there is a gloss. In this appendix there is a table with isolated nominals, a table with isolated verbs, and a table with sentences.

Isolated Nominals

(1)	Gloss	a fish	path	my path	rubber tree
	Base Word	kɔʧi	ɔnma	iɛman	ɔɛt
A	Capuchin Monkey	kɔʧigi	ɔnamaga	iɛnamagan	ɔɛgɛt
B	Titi Monkey	idigɔʧi	idinma	idinman	idiɛt
C	Squirrel Monkey	kɔpʧi	ɔpta	iɛptan	ɔptɛt
D	Curassow	witʃi	winma	winman	wiɛt

E	Trumpeter	pɔʧi	pɔnma	pɔnman	pɔɛt
F	Coati	nɯʧi	nɯnma	nɯnman	nɯɛt
G	Agouti	piʧi	pinma	pinman	piɛt
H	Pecarry, Dog	tɔʧi	tɔnma	tɔnman	tɔɛt
I	Macaw	ɛŋnaʧi	ɛŋanma	ɛŋnanman	ɛŋnaɛt
J	Toucan	ɛŋaraʧi	ɛŋnaranma	ɛŋnaranman	ɛŋnaraɛt
K	Spider Monkey	untʃi	unma	unman	unɛt
L	Howler Monkey	kɔ̃ʧĩ	ɔ̃nmã	ĩɛ̃nmãn	ɔ̃ɛ̃t
M	Tortoise	kætʃɛ	ænmæ	iænmæn	aæt

(2)	Gloss	fish	my fish	a fish	a fish
	Base Word	wɔt	ɯwɔt	ɔrɛmi	ɔtpa
A	Capuchin Monkey	wɔgɔt	ɯwɔgɔt	ɔrɛmigi	ɔtpaga
B	Titi Monkey	idiwɔt	idiwɔt	idimi	iditpa
C	Squirrel Monkey	wɔptɔt	ɯptɔt	ɔptɛmi	ɔpta
D	Curassow	wiwɔt	wiwɔt	wirɛmi	witpa
E	Trumpeter	pɔwɔt	pɔwɔt	pɔrɛmi	pɔtpa
F	Coati	nɯwɔt	nɯwɔt	nɯrɛmi	nɯtpa
G	Agouti	piwɔt	piwɔt	pirɛmi	pitpa
H	Peccary, Dog	tɔwɔt	tɔwɔt	tɔrɛmi	tɔtpa
I	Macaw	ɛŋnawɔt	ɛŋnawɔt	ɛŋarɛmi	ɛŋnatpa
J	Toucan	ɛŋarawɔt	ɛŋnarawɔt	ɛŋararɛmi	ɛŋaratpa
K	Spider Monkey	unwɔt	unɯwɔt	unarɛmi	unba/ʔunotpa
L	Howler Monkey	wɔ̃t	ɯ̃wɔ̃t	ɔ̃rɛ̃mĩ	ɔ̃tpã
M	Tortoise	wæt	ɛwæt	æræme	ɛtpæ

(3)	Gloss	mud	we all	night	abcess
	Base Word	ikpa	ugɔrɔŋmɔ	kɔk	nu
A	Capuchin Monkey	ikpaga	ugɔrɔŋmɔgɔ	kɔgɔk	nugu
B	Titi Monkey	idikpa	idigɔrɔŋmɔ	idigɔk	idinu
C	Squirrel Monkey	ipta	uptɔŋmɔ	koptɔk	nuptu
D	Curassow	wikpa	wigɔrɔŋmɔ	wigɔk	winu
E	Trumpeter	pɔkpa	pɔgɔrɔŋmɔ	pɔgɔk	pɔnu
F	Coati	nɯkpa	nɯgɔrɔŋmɔ	nɯgɔk	nɯnu
G	Agouti	pikpa	pigɔrɔŋmɔ	pigɔk	pinu
H	Peccary, Dog	tɔkpa	tɔgɔrɔŋmɔ	tɔgɔk	tɔnu
I	Macaw	ɛŋnakpa	ɛŋnagɔrɔŋmɔ	ɛŋnagɔk	ɛŋnanu
J	Toucan	ɛŋnarakpa	ɛŋnaragɔrɔŋmɔ	ɛŋnaragɔk	ɛŋnaranu
K	Spider Monkey	unikpa	ungɔrɔŋmɔ	ungɔk	unu
L	Howler Monkey	ĩkpã	ũgɔ̃rɔ̃ŋmɔ̃	kɔ̃k	nũ
M	Tortoise	ikpæ	ugɛrɛŋmɛ	kak	næ

(4)	Gloss	my clothes	forest	tree	small peccary
	Base Word	iabɔi	idua	iei	pɔu
A	Capuchin Monkey	iabɔigi	iduaga	iɛigi	pɔugu
B	Titi Monkey	idibɔi	ididua	idijɛi	idibɔu
C	Squirrel Monkey	iaptɔi	iptua	jɛptɛi	pɔptu
D	Curassow	wibɔi	widua	wijɛi	wibɔu
E	Trumpeter	pɔbɔi	pɔdua	pɔjɛi	pɔbɔu
F	Coati	nɯbɔi	nɯdua	nɯɛɛi/nɯɛi	nɯbɔu
G	Agouti	pibɔi	pidua	piɯɛi	pibɔu
H	Peccary, Dog	tɔbɔi	tɔdua	tɔjɛi	tɔbɔu
I	Macaw	ɛŋnabɔi	ɛŋnadua	ɛŋnaɯi	ɛŋnabɔu
J	Toucan	ɛŋnaɾabɔi	ɛŋnaɾadua	ɛŋnaɾai	ɛŋanɾabɔu
K	Spider Monkey	unbɔi	undua	unɛi	unbɔu
L	Howler Monkey	ĩãbɔ̃ĩ	ĩdũã	ĩɛ̃ĩ	pɔũ
M	Tortoise	iæbɔi	eduæ	iæi	pæu

(5)	Gloss	bench	a fish	a fish	stingray
	Base Word	muɾɛi	omiaɛgu	mɯdaimɔ	ambamba
A	Capuchin Monkey	muɾɛigi	omiaɛgugu	mɯdaimɔgɔ	ambambaga
B	Titi Monkey	idimuɾɛi	idimiaɛgu	idimɯdaimɔ	idimbamba
C	Squirrel Monkey	muptɛi	ɔptiaɛgu	mɯptaimɔ	aptamba
D	Curassow	wimɛɾɛi	wimiaɛgu	widaimɔ	wimbamba
E	Trumpeter	pɔmɛɾɛi	pɔmiaɛgu	pɔdaimɔ	pɔmbamba
F	Coati	nɯmɛɾɛi	nɯmiaɛgu	nɯdaimɔ	nɯmbamba
G	Agouti	pimɛɾɛi	pimiaɛgu	pidaimɔ	pimbamba
H	Peccary, Dog	tɔmɛɾɛi	tɔmiaɛgu	tɔdaimɔ	tɔmbamba
I	Macaw	ɛŋnamuɾɛi	ɛŋnamiaɛgu	ɛŋnadaimɔ	ɛŋnambamba
J	Toucan	ɛŋnaɾamuɾɛi	ɛŋnaɾamiaɛgu	ɛŋnaɾadaimɔ	ɛŋnaɾambamba
K	Spider Monkey	unmɛɾɛi	unmiaɛgu	unmɯdaimɔ	unambamba
L	Howler Monkey	mũɾɛ̃ĩ	unõmĩãɛ̃gũ	mũdãĩmɔ̃	ãmbãmbã
M	Tortoise	meɾæi	æmiæɛgu	mædɐimæ	æmbæmbæ

(6)	Gloss	knife	armadillo	a bird	night monkey
	Base Word	pɯlɛptɛ	ɔtpidɔ	kɔtkɔt	kutkut
A	Capuchin Monkey	pɯlɛptɛgɛ	ɔtpidɔgɔ	kɔtkɔgɔt	kutkugut
B	Titi Monkey	idibɯlɛptɛ	iditpidɔ	iditkɔt	iditkut
C	Squirrel Monkey	pɯptɛtɛ	ɔptidɔ	kɔptɔt	kuptut
D	Curassow	wilɛptɛ	witpidɔ	witkɔt	witkut
E	Trumpeter	pɔlɛptɛ	pɔtpidɔ	pɔtkɔt	pɔtkut
F	Coati	nɯlɛptɛ	nɯtpidɔ	mɯtkɔt	mɯtkut
G	Agouti	pilɛptɛ	pitpidɔ	pitkɔt	pitkut
H	Peccary, Dog	tɔlɛptɛ	tɔtpidɔ	tɔtkɔt	tɔtkut

I	Macaw	eŋnaleptɛ	ɛŋnatpidɔ	ɛŋnatkɔt	ɛŋnatkut
J	Toucan	eŋnaralɛptɛ	ɛŋnaratpidɔ	ɛŋnaratkɔt	ɛŋnaratkut
K	Spider Monkey	unbɯlɛptɛ	unɔtpidɔ	ungɔtkɔt	ungutkut
L	Howler Monkey	pɯ̃lɛ̃ptɛ̃	ɔ̃tpĩdɔ̃	kɔ̃tkɔ̃t	kũtkũt
M	Tortoise	pɛlɛptɛ	ætpidæ	kætkæt	kætkæt

(7)	Gloss	armadillo	penis	head	a fruit
	Base Word	ɔtkɔimɔ	ɛnbɛn	imumʤi	pɛɾa
A	Capuchin Monkey	ɔtkɔimɔgɔ	enbɛgɛn	imumʤigi	pɛlaga
B	Titi Monkey	iditkɔimɔ	idinbɛn	idimumʤi	idibeɾa
C	Squirrel Monkey	ɔptɔimɔ	ɛptɛn	iptupti	pɛpta
D	Curassow	witkɔimɔ	winbɛn	wimumʤi	wiɾa
E	Trumpeter	pɔtkɔimɔ	pɔnbɛn	pɔmumʤi	pɔɾa
F	Coati	nɯtkɔimɔ	nɯnbɛn	nɯmumʤi	nɯɾa
G	Agouti	pitkɔimɔ	pinbɛn	pimumʤi	piɾa
H	Peccary, Dog	tɔtkɔimɔ	tɔnbɛn	tɔmumʤi	tɔɾa
I	Macaw	ɛŋnatkɔimɔ	ɛŋnanbɛn	ɛŋnamumʤi	ɛŋnaɾa
J	Toucan	ɛŋnaratkɔimɔ	ɛŋnaranbɛn	ɛŋaramumʤi	ɛŋnaraɾa
K	Spider Monkey	unɔtkɔimɔ	unɛnbɛn	unmumʤi	unbeɾa
L	Howler Monkey	ɔ̃tkɔ̃ĩmɔ̃	ɛ̃nbɛ̃n	ĩmũmʤĩ	pɛ̃ɾã
M	Tortoise	ætkæimæ	ænbæn	æmɔmʤi	pɛɾæ

(8)	Gloss	a beetle	uncles	an arrow	wood tick
	Base Word	pɔmu	kɔkɔŋmɔ	pɯɾak	pɔtpɯɾi
A	Capuchin Monkey	pɔmugu	kɔkɔŋmɔgɔ	pɯɾagak	pɔtpɯɾigi
B	Titi Monkey	idimu	idikɔŋmɔ	idibɯɾak	iditpɯɾi
C	Squirrel Monkey	pɔptu	kɔptɔŋmɔ	pɯptak	popti
D	Curassow	wimu	wikɔŋmɔ	wiɾak	witpɯɾi
E	Trumpeter	pɔmu	pɔkɔŋmɔ	pɔɾak	pɔtpɯɾi
F	Coati	nɯmu	nɯkɔŋmɔ	nɯɾak	nɯtpɯɾi
G	Agouti	pimu	pikɔŋmɔ	piɾak	pitpɯɾi
H	Peccary, Dog	tɔmu	tɔkɔŋmɔ	tɔɾak	tɔtpɯɾi
I	Macaw	ɛŋnamu	ɛŋnakɔŋmɔ	ɛŋnaɾak	ɛŋnatpɯɾi
J	Toucan	ɛŋnaɾamu	ɛŋnaɾakɔŋmɔ	ɛŋnaraɾak	ɛŋnaratpɯɾi
K	Spider Monkey	unbɔmu	ungɔŋmɔ	unbɯɾak	unbɯɾi
L	Howler Monkey	pɔ̃mũ	kɔ̃kɔ̃ŋmɔ̃	pũɾãk	pɔ̃tpũɾĩ
M	Tortoise	pamu	kækæŋmæ	pɛɾæk	pɛtpɛɾi

(9)	Gloss	her vagina	club	his wife	wasp
	Base Word	itutun	apon	ibɯt	aɛ
A	Capuchin Monkey	itutugun	apogon	ibɯgɯt	aɛgɛ
B	Titi Monkey	iditutun	idipon	idibɯt	idiɛ
C	Squirrel Monkey	ittun	apton	iptɯt	aptɛ
D	Curassow	witutun	wipon	wibɯt	wiɛ

E	Trumpeter	pɔtutun	pɔpon	pɔbɯt	pɔɛ
F	Coati	nɯtutun	nɯpon	nɯbɯt	nɯɛ
G	Agouti	pitutun	pipon	pibɯt	piɛ
H	Peccary, Dog	tɔtutun	tɔpon	tɔbɯt	tɔɛ
I	Macaw	ɛŋnatutun	ɛŋnapon	ɛŋnabɯt	ɛŋnaɛ
J	Toucan	ɛŋnaɾatutun	ɛŋnaɾapon	ɛŋnaɾabɯt	ɛŋnaɾaɛ
K	Spider Monkey	unitutun	unbon	unbɯt	unaɛ
L	Howler Monkey	ĩtũtũn	ãpõn	ĩbũ̃t	ãɛ̃
M	Tortoise	ɛtɛtɛn	æpɛn	ɛbæt	æɛ

(10)	Gloss	brothers	bird hind quarter	his bird hind quarter	catfish
	Base Word	muniŋmɔ	piluŋɔ	ipilun	pɔɾat
A	Capuchin Monkey	muniŋmɔgɔ	piluŋɔgɔ	ipilugun	pɔɾagat
B	Titi Monkey	idimuniŋmɔ	idipiluŋɔ	idipilun	idibɔɾat
C	Squirrel Monkey	muptiŋmɔ	piptuŋɔ	iptilun	pɔptat
D	Curassow	winiŋmɔ	wipiluŋɔ	wipilun	wibɔɾat
E	Trumpeter	pɔniŋmɔ	pɔpiluŋɔ	pɔpilun	pɔbɔɾat
F	Coati	nɯniŋmɔ	nɯpiluŋɔ	nɯpilun	nɯbɔɾat
G	Agouti	piniŋmɔ	pipiluŋɔ	pipilun	pibɔɾat
H	Peccary, Dog	tɔniŋmɔ	tɔpiluŋɔ	tɔpilun	tɔbɔɾat
I	Macaw	ɛŋnaniŋmɔ	ɛŋnapiluŋɔ	ɛŋnapilun	ɛŋnabɔɾat
J	Toucan	ɛŋnaɾaniŋmɔ	ɛŋnaɾapiluŋɔ	ɛŋnaɾapilun	ɛŋnaɾabɔɾat
K	Spider Monkey	unmuniŋmɔ	unbiluŋɔ	unbilun	unɔɾat
L	Howler Monkey	mũnĩŋmɔ̃	pĩlũŋɔ̃	ĩpĩlũn	pɔ̃ɾãt
M	Tortoise	mæniŋmæ	pɛlɛŋæ	ɛpɛlun	pɛræt

(11)	Gloss	bird	macaw spp.	deceased father	gourd
	Base Word	kuɾɔkuɾɔ	kaɾa	papamgɛni	kamap
A	Capuchin Monkey	kuɾɔkuɾɔgɔ	kaɾaga	papagamgɛni	kamagap
B	Titi Monkey	idiɾɔkuɾɔ	idigaɾa	idipamgɛni	idimap
C	Squirrel Monkey	kuptɔkuɾɔ	kapta	paptamgɛni	kaptap
D	Curassow	wiɾɔkuɾɔ	wiɾa	wipamgɛni	wimap
E	Trumpeter	pɔɾɔkuɾɔ	pɔɾa	pɔpamgɛni	pɔmap
F	Coati	nɯɾɔkuɾɔ	nɯɾa	nɯpamgɛni	nɯmap
G	Agouti	piɾɔkuɾɔ	piɾa	pipamgɛni	pimap
H	Peccary, Dog	tɔɾɔkuɾɔ	tɔɾa	tɔpamgɛni	tɔmap
I	Macaw	ɛŋnaɾɔkuɾɔ	ɛŋnaɾa	ɛŋnapamgɛni	ɛŋnamap
J	Toucan	ɛŋnaɾaɾɔkuɾɔ	ɛŋnaɾaɾa	ɛŋnaɾapamgɛni	ɛŋnaɾamap
K	Spider Monkey	ungurɔkuɾɔ	ungaɾa	unbamgɛni	ungamap
L	Howler Monkey	kũɾɔ̃kũɾɔ̃	kãɾã	pãpãmgɛ̃nĩ	kãmãp
M	Tortoise	kærækæræ	kæræ	pæpæmgɛni	kæmæp

(12)	Gloss	my food	men	banana (type of)	banana
	Base Word	ɯun	ugongom	taupa	womjum
A	Capuchin Monkey	ɯugun	ugongogom	taupaga	womjugum
B	Titi Monkey	idiun	idigongom	idiupa	idimium
C	Squirrel Monkey	ɯktun	uktɜngom	taptupa	wɔptium
D	Curassow	wiun	wigɜngom	wiupa	wimium
E	Trumpeter	pɔun	pɔgɔngom	pɔupa	pɔmium
F	Coati	nɯun	negɜngɜm	nɯupa	nɯmium
G	Agouti	piun	pigɜnbɛ	piupa	pimium
H	Peccary, Dog	tɔun	tɔgɔngom	tɔupa	tɔmium
I	Macaw	ɛŋnaun	ɛŋnagɜngom	ɛŋnaupa	ɛŋnamium
J	Toucan	ɛŋnaɾaun	ɛŋnaɾagongom	ɛŋnaɾaupa	ɛŋnaɾamium
K	Spider Monkey	unɯun	unungɜnbɛ	unaupa	uŋmium
L	Howler Monkey	ũũ̃n	ugɜ̃nbɛ̃	tãũpã	wõmj̃ũm
M	Tortoise	ɛun	ugɜngɜm	tæepæ	wɜmjɜm

(13)	Gloss	our (all) leg
	Base Word	uguptʃingɔm
A	Capuchin Monkey	uguptʃingɔgɔm
B	Titi Monkey	idiptʃingɔm
C	Squirrel Monkey	uguptingɔm
D	Curassow	wiptʃingɔm
E	Trumpeter	pɔgɔptʃingɔm
F	Coati	nɯptʃingɔm
G	Agouti	piptʃingɔm
H	Peccary, Dog	tɔptʃingɔm
I	Macaw	ɛŋnaptʃingɔm
J	Toucan	ɛŋnaɾaptʃingɔm
K	Spider Monkey	unbɯtʃingɔm
L	Howler Monkey	ũgũptʃĩngɔ̃m
M	Tortoise	ɛguptʃingɔm

Isolated Verbs and Adjectives

(14)	Gloss	slept	I'm going to sleep (near)	make her/him sleep
	Base Word	tɔwɯngɯt	ɯwɯngɯda	iɯngɯnɔpkɔ
A	Capuchin Monkey	tɔwɯngɯgɯt	ɯwɯngɯdaga	iɯngɯnɔpkɔgɔ
B	Titi Monkey	idiwɯngɯt	idiwɯngɯda	idiwɯngɯnɔpkɔ
C	Squirrel Monkey	tɔptɯngɯt	ɯptɯngɯda	iɯptɯngɯnɔpkɔ
D	Curassow	wiwɯngɯt	wiwɯngɯda	wiwɯngɯnɔpkɔ
E	Trumpeter	pɔwɯngɯt	pɔwɯngɯda	pɔwɯngɯnɔpkɔ
F	Coati	nɛwɯngɯt	nɯwɯngɯda	nɯwɯngɯnɔpkɔ
G	Agouti	piwɯngɯt	piwɯngɯda	piwɯngɯnɔpkɔ

H	Peccary, Dog	tɔwɯngɯt	tɔwɯngɯda	tɔwɯngɯnɔpkɔ
I	Macaw	ɛŋnawɯngɯt	ɛŋnawɯngɯda	ɛŋnawɯngɯnɔpkɔ
J	Toucan	ɛŋnaɾawɯngɯt	ɛŋnaɾawɯngɯda	ɛŋnaɾawɯngɯnɔpkɔ
K	Spider Monkey	unɯngɯt	unɯngɯda	unɯngɯnɔpkɔ
L	Howler Monkey	tɔ̃wɯ̃ngɯ̃t	ɯ̃wɯ̃ngɯ̃dã	ĩɯ̃ngɯ̃nɔ̃pkɔ̃
M	Tortoise	tæwængɛt	ɯwængædæ	iængænæpkæ

(15)	Gloss	s/he ate	for her/him	I wrote
	Base Word	agulɯ	ɯwɯna	indɛkɛlɯ
A	Capuchin Monkey	agulɯgɯ	ɯwɯnaga	indɛkɛlɯgɯ
B	Titi Monkey	idigulɯ	idiwɯna	idindɛkɛlɯ
C	Squirrel Monkey	aptulɯ/aktulɯ	ɯptɯna	iptɛkɛlɯ
D	Curassow	wigulɯ	wiwɯna	windɛkɛlɯ
E	Trumpeter	pɔgulɯ	pɔwɯna	pɔndɛkɛlɯ
F	Coati	nɯgulɯ	nɯwɯna	nɯndɛkɛlɯ
G	Agouti	pigulɯ	piwɯna	pindɛkɛlɯ
H	Peccary, Dog	tɔgulɯ	tɔwɯna	tɔndɛkɛlɯ
I	Macaw	ɛŋnagulɯ	ɛŋnawɯna	ɛŋnandɛkɛlɯ
J	Toucan	ɛŋnaragulɯ	ɛŋnaɾawɯna	ɛŋnaɾandɛkɛlɯ
K	Spider Monkey	ungulɯ	ɯnɯwɯna	undɛkɛlɯ
L	Howler Monkey	ãgũlɯ̃	ɯ̃wɯ̃nã	ĩndɛ̃kɛ̃lɯ̃
M	Tortoise	ægulɛ	ɯwænæ	indækælæ

(16)	Gloss	I'm going to wash my own hand	it's good	it's bad
	Base Word	kɔdɛmiagurugɛda	kurɛp	wɯrɯpɛ
A	Capuchin Monkey	kɔdɛmiagurugɛdaga	kurɜgɛp	wɯrɯpɛgɛ
B	Titi Monkey	idimiagurugɛda	idirɛp	idirɯpɛ
C	Squirrel Monkey	kɔptɛmiagurugɛda	kuptɛp	wɯptɯpɛ
D	Curassow	widɛmiagurugɛda	wirɛp	wirɯpɛ
E	Trumpeter	pɔdɛmiagurugɛda	pɔrɛp	pɔrɯpɛ
F	Coati	nɯdɛmiagurugɛda	nɯrɛp	nɯrɯpɛ
G	Agouti	pidɛmiagurugɛda	pirɛp	pirɯpɛ
H	Peccary, Dog	tɔdɛmiagurugɛda	tɔrɛp	tɔrɯpɛ
I	Macaw	ɛŋnadɛmiagurugɛda	ɛŋnaɾɛp	ɛŋnaɾɯpɛ
J	Toucan	ɛŋnaɾadɛmiagurugɛda	ɛŋnaɾaɾɛp	ɛŋnaɾaɾɯpɛ
K	Spider Monkey	undɛmiagurugɛda	ungurɛp	unɯrɯpɛ
L	Howler Monkey	kɔ̃deɛ̃mĩãgũrũgɛ̃dã	kũrɛ̃p	wũrũpɛ̃
M	Tortoise	kædæmiægɛrɛgɛdæ	kuræp	wæræpæ

Sentences

(17)	Gloss	I came from the forest without any load
	Base Sentence	tapɔrɛ tagiɛ wɛbɯlɯ iduandubɔp
A	Capuchin Monkey	tapɔrɛgɛ tagiɛ wɛbɯlɯ iduandubɔgɔp
B	Titi Monkey	idipɔrɛ tagiɛ wɛbɯlɯ ididuandubɔp
C	Squirrel Monkey	taptorɛ tagiɛ wɛbɯlɯ iptuandubɔp
D	Curassow	wipɔrɛ tagiɛ wɛbɯlɯ widuandubɔp
E	Trumpeter	pɔpɔrɛ tagiɛ wɛbɯlɯ pɔduandubɔp
F	Coati	nɯpɔrɛ tagiɛ wɛbɯlɯ nɯduandubɔp
G	Agouti	pipɔrɛ tagiɛ wɛbɯlɯ piduandubɔp
H	Peccary, Dog	tɔpɔrɛ tagiɛ wɛbɯlɯ tɔduandubɔp
I	Macaw	ɛŋnapɔrɛ tagiɛ wɛbɯlɯ ɛŋnaduandubɔp
J	Toucan	ɛŋnaɾapɔrɛ tagiɛ wɛbɯlɯ ɛŋnaɾaduandubɔp
K	Spider Monkey	unbɔrɛ tagiɛ wɛbɯlɯ unduandubɔp
L	Howler Monkey	tãpɔ̃rɛ̃ tãgĩɛ̃ wɛ̃bɯ̃lɯ̃ ĩdɯ̃ãndɯ̃bɔ̃p
M	Tortoise	tæpɛɾæ tægiɛ wæbɛlɛ ɛduændubɛp

(18)	Gloss	my deceased father ate the tropical fruit (spp.)
	Base Sentence	pitɔt jɛmilɯ papamgɛni
A	Capuchin Monkey	pitɔgɔtʃɛmilɯ papagamgɛni
B	Titi Monkey	iditɔtʃɛmilɯ idipamgɛni
C	Squirrel Monkey	piptɔtʃɛmilɯ paptamgɛni
D	Curassow	witɔtʃɛmilɯ wipamgɛni
E	Trumpeter	pɔtɔtʃɛmilɯ pɔpamgɛni
F	Coati	nɯtɔtʃɛmilɯ nɯpamgɛni
G	Agouti	pitɔtʃɛmilɯ pipamgɛni
H	Peccary, Dog	tɔtɔtʃɛmilɯ tɔpamgɛni
I	Macaw	ɛŋnatɔtʃɛmilɯ ɛŋnapamgɛni
J	Toucan	ɛŋnaɾatɔtʃɛmilɯ ɛŋnaɾapamgɛni
K	Spider Monkey	unbitɔtʃɛmilɯ unbamgɛni
L	Howler Monkey	pĩtɔ̃tʃɛ̃mĩlɯ̃ pãpãmgɛ̃nĩ
M	Tortoise	petatʃɛmilɛ pæpæmgɛni

(19)	Gloss	the tayra did not eat the tropical fruit (spp.)
	Base Sentence	pitɔt jɛmibɯra gumɯk wajugɔ
A	Capuchin Monkey	pitɔgɔtʃɛmibɯra gumɯk wajugɔgɔ
B	Titi Monkey	iditɔtʃɛmibɯra gumɯk idiwajugɔ
C	Squirrel Monkey	piptɔtʃɛmibɯra gumɯk waptugɔ
D	Curassow	witɔtʃɛmibɯra gumɯk wiugɔ
E	Trumpeter	pɔtɔtʃɛmibɯra gumɯk pɔjugɔ
F	Coati	nɯtɔtʃɛmibɯra gumɯk nɯjugɔ
G	Agouti	pitɔtʃɛmibɯra gumɯk piugɔ
H	Peccary, Dog	tɔtɔtʃɛmibɯra gumɯk tɔjugɔ
I	Macaw	ɛŋnatɔtʃɛmibɯra gumɯk ɛŋnajugɔ

J	Toucan	ɛŋnaratɔtʃɛmibɯra gumɯk ɛŋarajugɔ
K	Spider Monkey	unbitɔtʃɛmibɯra gumɯk unwajugɔ
L	Howler Monkey	pĩtɔ̃tʃɛ̃mĩbɯ̃rã gɯ̃mɯ̃k wãjɯ̃gɔ̃
M	Tortoise	petatʃɛmibɛræ gumɛk wæjuga

(20)	Gloss	I killed repeatedly macaws yesterday on the inga tree
	Base Sentence	kara inwɔtkɛlɯ kɔgɔnŋɛ taukara bɔk
A	Capuchin Monkey	kalaga inwɔtkɛlɯ kɔgɔnŋɛgɛ taukalaga bɔk
B	Titi Monkey	idiara inwɔtkɛlɯ idigɔnŋɛ idiukara bɔk
C	Squirrel Monkey	kapta inwɔtkɛlɯ kɔptɔnŋɛ taupta bɔk
D	Curassow	wira inwɔtkɛlɯ wigɔnŋɛ wiukara bɔk
E	Trumpeter	pɔra inwɔtkɛlɯ pɔgɔnŋɛ pɔukara bɔk
F	Coati	nɯra inwɔtkɛlɯ nɯgɔnŋɛ nɯukara bɔk
G	Agouti	pira inwɔtkɛlɯ pigɔnŋɛ piukara bɔk
H	Peccary, Dog	tɔra inwɔtkɛlɯ tɔgɔnŋɛ tɔukara bɔk
I	Macaw	ɛŋnara inwɔtkɛlɯ ɛŋnagɔnŋɛ ɛŋnaukara bɔk
J	Toucan	ɛŋnarara inwɔtkɛlɯ ɛŋnaragɔnŋɛ ɛŋnaraukara bɔk
K	Spider Monkey	ungara inwɔtkɛlɯ ungɔgɔnŋɛ unaukara bɔk
L	Howler Monkey	kãrã ĩnwɔ̃tkɛ̃lɯ̃ kɔ̃gɔ̃nŋɛ̃ tãɯ̃kãrã bɔ̃k
M	Tortoise	kæræ inwatkɛlɛ kɛgɛnŋɛ tæukæræ bɛk

Appendix 4

Recording of Ludlings

In this appendix I present examples of ludling data in the context of larger syntactic units, including phrases, clauses, sentences, and discourse. I have transcribed (phonetically) these data based on recordings I made in 2010 on location in Laranjal village (see Introduction and Chapter one). The recordings were made using the program Audacity; the microphone used was a Galaxy Audio on an HDR2 (handheld digital recorder). The speaker is Tjimi Arara, a 73 year old male. I asked him to make up one story or conversation about each of the different ludlings. I suggested that he use the Arara base word /taupa/ 'species of banana' as a consistent topic for each one of these texts. Each ludling story in this appendix is separated into its own distinct table. Glosses of each individual morpheme appear right below the Arara forms (in the same cell), and a free translation is given in the column to the right. When I could not make out certain words that Tjimi said in the recordings, I use numbers in the free translation column to refer to the location in the Audacity file where that portion of speech occurs.

It is noteworthy that Tjimi is the only Arara speaker who still remembers all thirteen ludling forms. Furthermore, he appears to be the only speaker who can fluently put these words together into larger utterances of this type, i.e., conversations. However, it is very evident in these recordings that he frequently hesitates, as though he finds the task difficult. In addition, the ludling which he hesitates with the most is the squirrel monkey ludling (see the third section below "Squirrel monkeys ludling"). All other Arara

speakers familiar with this ludling consistently form it by infixing /-pt-/ after the first vowel. Nevertheless, while Tjimi uses /-pt-/ in most cases, such as in this appendix, he sometimes changes this empty morpheme to /-kt-/, or even /-tt-/, as in Appendix 3.

Capuchin Monkey ludling: /-gV-/; /ɾ/ > [l] (see Section 4.2.1)

(1)	taupa-ga dəŋ banana-LUD be	'it is a banana'
(2)	tɜupɜ	'banana'
(3)	taupa-ga banana-LUD	'banana'
(4)	tɔlek-kom-bɛ-ge tagie tɔɾɔŋ dɔɾɔŋ dɔdeː big-Pl-Adjr-LUD very Ideoph Ideoph Ideoph	'they are very big, very big, very big'
(5)	i-enba-ga-n 1Abs-food-LUD-Poss	'it is my (soft) food'
(6)	i-nba-n 2Abs-food-Poss	'it is your food'
(7)	i-enba-ga-n 1Abs-food-LUD-Poss	'it is my food'
(8)	ũhũ, i-enba-n biget (matu) Ideoph 1Abs-food-Poss few ?	'yes, it is my little bit of food (matu: speech error?)'
(9)	(m)-enep-tɔmɛ-gɛ mondo lon (2Erg)-bring-Fut-LUD there Emph	'you will bring it from there'
(10)	imbala-ga ja Neg?-LUD Emph?	'no (emphatic)' (location in the file: 15)
(11)	ug-enba-ga-n-gom dəŋ 12Abs-food-LUD-Poss-Pl be	'it is our food' (change in the order of the ludlingant)
(12)	enŋa (hɜ̃hɜ̃) agreement (hesitation)	'good idea!'
(13)	taupa-ga tɔɾik-kom-be-ge tahie kumɯk banana-LUD big-Pl-Adjr-LUD emph Rem.Imperf	'the bananas were very big' (fricativization of /g/: tahie)
(14)	ɯː tan bɯdek an pe-ge pa darik ka gumɯk Ideoph here like ? ? ? big Q Rem	'(location in the file: 24-28)'
(15)	kun-ge bɯla it-taŋ-gɯ Rem-say ? Aux?-Uni-Imperf?	'(location in the file: 25-30)'
(16)	man m-an-enep… attention 2Erg-Inc-bring	'look, you start bringing…'
(17)	m-an-enep-tomɛ (ũh) 2Erg-Inc-bring-fut (hesitation)	'you will start bringing them'

(18)	m-enep-tome-ge 2Erg-bring-Fut-LUD	‘you will bring them’
(19)	kɔgɜlone n-itʃ-a-gah tomorrow Abs-Aux-Perm-LUD	‘leave it for tomorrow’ (extra /h/ in the ludlingant)
(20)	heŋa (hũ) agreement (hesitation)	‘good idea!’ (extra /h/ in the word for agreement)

Titi monkeys ludling: /idi-/ (see Section 4.2.2)

(21)	idi-upa LUD-banana	‘banana’
(22)	taupa	‘banana’
(23)	idi-upa (hũhũ) LUD-banana (hesitation)	‘banana’
(24)	idi-ɔmjum-ɯrɯ LUD-banana-field	‘banana field’
(25)	hɔhɔ ɜdɔ ɔmjum-ɯrɯ ? ? banana-field	‘banana field’
(26)	malɔn-ne to-bin-de enough-only T-ripe-Nmlz	‘(in the field there are) only ripened (yellow) ones’
(27)	etʃid edaɾe-ge-n ? ?	‘(location in the file: 49-50)’
(28)	idi-ɾik-kom-bɛ tagie LUD-big-Pl-Adjr very	‘they (bananas) are very big’
(29)	ka-am-bɯɾa wɯna dite... high-Loc-Neg ? ?	‘they (the trees) are short, …’
(30)	m-an-enep-tɔ(me) 2Erg-Inc-bring-Fut	‘you will start bringing (them)’
(31)	m-an-enep-tɔme botkɯn 2Erg-Inc-bring-Fut very	‘you will start bringing (them, emphatic)’
(32)	idi-nakta LUD-?	‘(location in the file: 57)’
(33)	idi-gɜlɜne n-itʃ-ʒ̥ tetʃiŋ LUD-tomorrow 3-Aux-Perm ?	‘leave it for tomorrow’
(34)	malon uɾɔ tẽkete hũ enough I ? babbling	‘(location in the file: 1:00-1:05)’
(35)	n-eneb-a wɯ-ge-naŋɯrɯ... 3Abs-bring-Perm 1Erg-say-Prog	‘let him bring (them), I say’
(36)	idi-βe-ta-nbom LUD-bring?-Dist-later	‘you bring (them) later’
(37)	idi-ɾɜ lɜn LUD-? Emph	‘(location in the file: 1:06.0)’

(38)	idi-upa tɜɾik-kom-be tɜ(gie) LUD-banana big-pl-Adjr very	‘the bananas are very big’

Squirrel monkeys ludling: /-pt-/ or /-kt-/ (see Section 3.2.11)

(39)	ta-pt-ɔpa (hɯ̃) banana-LUD-banana (hesitation)	‘banana’
(40)	tɜmhep tɔ-biu-n-de a-wɔmjum-ɯrɯ ? T-bridge-?-? 3Abs-banana-field	‘? .... his banana field’
(41)	ta-pt-ɔpa lɜn ɯndik-kom-be tagalia banana-LUD-banana Emph big-Pl-Adjr very?	‘the bananas themselves are very big’
(42)	lili (w)adi(te) ? how.is.it	‘? …. oh boy! (lit.:how is it)? (location in the file: 1:20-1:25)’
(43)	ẽ, womjum-ɯrɯ-p taɾik-kom Ideoph banana-field-Adjr big-Pl	‘yes, the banana field is big’
(44)	womjum tɔp taɾik-kom-be kun-ʤa-dɯ-k, ehe banana ? big-pl-Adjr Rem-say-Pl-? yes	‘yes, they say that the bananas are big’
(45)	tɜ-pt-ɔpa banana-LUD-banana ɯ-wɜ-pt-jum-ɯrɯ-p 1Abs-banana-LUD-banana-field-Adjr	‘it is a banana, my banana field’
(46)	ũhũ:, malon kun-it-ta-g lɜn Ideoph enough Rem-Aux-always-? Emph	‘yes, it is always good’
(47)	tan'dakpomamiŋ taɾik-kom matanaŋ gaje ? big-Pl ? ?	‘(location in the file: 1:34.0-1:35.0)’
(48)	i-ep-tome … 1Erg-come-Fut	‘I will come …’
(49)	ẽhũhũ i-enba-n Ideoph 1Abs-food-Poss	‘yes, my food’
(50)	i-enba-n m-an-enep-tome 1Abs-food-Poss 2Erg-Inc-bring-Fut	‘you will start bringing my food’
(51)	i-enep-tome 1Erg-bring-Fut	‘I will bring (it)’

Curassows, chicken, hen, muscovy ducks, Brazilian merganser, guans ludling: /wi-/ (see Section 4.2.3)

(52)	(wi-u) wi-upa (LUD-bana…) LUD-banana	‘(bana…), banana’
(53)	taupa	‘banana’
(54)	wi-upa wi-ɾik-kom-be da(gie) LUD-banana LUD-big-Pl-Adjr very	‘the bananas are very big’

(55)	wɛ-ɾɛgɜn LUD-Ideoph	‘they are standing up’
(56)	eː kɜ-ɜm-bɯɾa gun-it-ta-k ? high-Loc-Neg Rem-Aux-always-?	‘it (the tree) is always short’
(57)	pɯɾəptadatpɯamo ?	‘(location in the file: 1:52.0-1:53.0)’
(58)	we-ɾik-kom-be LUD-big-Pl-Adjr	‘they are big’ (/we-/ instead of /wi-/ ‘LUD’)
(59)	wi-mɔ... wi-m... LUD-bana LUD-bana	‘bana(na), ba(nana)’
(60)	wi-womjum-ɯɾɯ LUD-banana-field	‘the banana field’
(61)	ũhũ malon-ne Ideoph enough-only	‘yes, that’s good’
(62)	i-enba-n m-an-enep-ta-nbom 1Abs-food-Poss 2Erg-Inc-bring-Dist-later	‘later you start bringing my food’
(63)	i-enep-ta 1Erg-bring-Dist	‘I am going to bring it (from there)’
(64)	wi-nep-ta-nbom LUD-bring-Dist-later	‘later I will bring it (from there)’
(65)	wi-nɛɾɛŋ LUD-Ideoph	‘it (the stalk) is hanging down’
(66)	wi-mom-ʤi bɔk LUD-head-Poss on	‘(bring them) on your head’
(67)	odɯ-ba- pan-ba …. what-doubt ?	‘oh boy!’
(68)	m-enep-ta-nbom botkɯn 2Erg-bring-Dist-later very	‘later you will bring it (emphatically)’
(69)	i-enep-ta	‘I am going to bring it (from there)’
(70)	wi-dɜ dɯd wi-it-tup LUD-go want LUD-Aux-if	‘if you want to go’
(71)	wi-kpɯ-a wi-baɾa kumɯg ja LUD-good-Perm LUD-Neg Rem.Imperf Emph?	‘let it get ripe; it was not ripe’
(72)	n-akpɯ-a bohtkɯn anumere pɜtpetʃin 3Abs-good-Perm Emph ? ?	‘let it get ripe (emphatically)’ (extra h)

Trumpeters and woodpeckers ludling: /pɔ-/ (see Section 4.2.4)

(73)	pɔ-upa LUD-banana	‘banana’
(74)	taupa	‘banana’
(75)	pɔ-upa pɔ-ɾik-kom-be tagie LUD-banana LUD-big-Pl-Adjr very	‘the bananas are very big’
(76)	pɔ-neɾeŋ LUD-Ideoph	‘it (the stalk) is hanging straight down’
(77)	hɛ̃hɛ̃ kɜ-ɜm-mɯra tɯ-mɜrɜŋ Ideoph high-Loc-Neg T-?	‘they (the banana trees) are short’ ([mɯra] instead of [bɯra])
(78)	ug-enba-n ũhũ 12Abs-food-Poss Ideoph	‘yes, it is our food’
(79)	pɔ-g-ɜnba-n ga-k … LUD-12?-food-Poss Q-3	‘is it our food …?’
(80)	pɔ-upa taɾik-kom-be pɔ-ɾik-kom-be tagie LUD-banana big-Pl-Adjr LUD-big-Pl-Adjr very	‘the bananas are big, very big’
(81)	pɔ-nɛɾɛŋ LUD-Ideoph	‘it (the stalk) is hanging straight down’
(82)	(pɔ-) pɔ-m-bɯra tagihe LUD LUD-Loc-Neg very	‘they (the banana trees) are very short (extra [h] in “tagie”)’
(83)	ka-am-bɯra gun-it-tɜ-k high-Loc-Neg Rem-Aux-always-?	‘they are always short’
(84)	tɜdɛŋbɔ aptandakpɔ-ŋmɔ emi-am ? ?-Pl hand-Loc	‘? … in the hand’ (location in the file: 2:42.0)
(85)	pɔ-lɔnɔ pɔ-tɜŋ LUD-? LUD-?	‘?’ (location in the file: 2:45.0-2:46.0)
(86)	m-on-ip-tomɛ 2Erg-Inc-come?-Fut	‘you will start coming’
(87)	wini ni-pigagun-de-Nmlz-naŋɯrɯ ? 3Abs-ripe-Verb-Caus-Prog	‘it (something) is causing it to become ripe (yellow)’
(88)	i-nba-(n) lɜn 2Abs-food-Poss Emph	‘it is your own food’
(89)	hũ pɔ-nba-(n) lɜn dɜŋ-gɯ Ideoph LUD-food-Poss Emph be-Imperf	‘yes, it was my food, later’
(90)	pɔ-da-nbom LUD-?-later	‘later … (hesitation?)’ (location in the file: 2:50)
(91)	pɔ-gɔlɜne n-itʃ-ɜ LUD-tomorrow 3Abs-Aux-Perm	‘leave it for tomorrow’
(92)	enŋɛ agreement	‘good idea!’

(93)	idɜ tət itkɜβɜ ũ ũ ũ go want ? hesitation	'? if (you) want to go …' (location in the file: 2:55)

Coati ludling: /nɯ-/ or /ne-/ (see Section 4.2.5)

(94)	nə-upɜ hə̃ LUD-banana hesitation	'banana'
(95)	ne-wɜmjum-ɯh ulɜnɜmɯ LUD-banana-? ?	'banana'
(96)	tarik-kom-be ga-k big-Pl-Adjr Q-3	'are they big?'
(97)	ni-rĩk-kɜm-bɛ gɜŋ LUD-big-Pl-Adjr be?	'they are big (location in the file: 3:05)'
(98)	enen-da see-Dist	'go there to see (them)'
(99)	nɛrɛŋ ũ Ideoph hesitation	'it (the stalk) is hanging straight down'
(100)	(i)-maɾa-ŋmɔ igana tɔrik-kom-be te 3-small-Pl ? big-Pl-adjr ?	'are they small, or big …?' (location in the file: 3:10)
(101)	nɜ-ɾik-kom-be LUD-big-Pl-Adjr	'they are big'
(102)	nə-upa ne-mi-am LUD-banana LUD-hand-Loc nə-ɾik-kom-be tah LUD-big-Pl-Adjr very?	'the bananas in his/her hand are very big'
(103)	nɜhnɜɾɜh te ?	'?' (location in the file: 3:15)
(104)	i-enba-n m-enep-ta m-enep-ta-nbom 1Abs-food-Poss 2Erg-bring-Dist 2Erg-bring-Dist-later	'later you will bring my food'
(105)	idɔ te it-tu(p) go want Aux-if	'if s/he wants to go' (missing /t/ in [te])
(106)	idɔ te(t) m-it-tup waŋpɜ hə̃ go want 2Erg-Aux-if ? hesitation	'if you want to go …'
(107)	ug-eɾemak-tadam-ane-ba 2Erg.1Abs-hurry-Iter-Admon-Aff	'do not hurry me!'
(108)	n-eŋab-a 3Abs-eat-Perm	'let her/him eat it' (different word for 'eat')
(109)	ne-gɜlɜne n-itʃ-a LUD-tomorrwo 3-Aux-Perm	'leave it for tomorrow'
(110)	enŋa kɜgɜlɜn agreement tomorrow	'good idea, tomorrow!'

(111)	kɜgɜlɜn-ne (n)-i-gune-lɯ moŋ tomorrow-only by-3Abs-sweat-Rec Aux	‘only tomorrow it will have gotten hot’
(112)	ɯdɯ i-pə …pə ʧitʃi be.careful 3-Adjr ? sun	‘be careful; it is sunny’ (if you carry bananas on it) (location in the file: 3:30)
(113)	o-mum-ʤi-kpɔ-taŋ 2Abs-head-Poss-sore-Fut	‘your head will be sore’ (location in the file: 3:35)
(114)	iu-mɔm-ʤi ?-head-Poss	‘my head’
(115)	nə-mum-ʤi muɾen mum-ʤi-kpɔ-tane LUD-head-Poss small head-Poss-sore-Admon	‘my little head can get sore!’
(116)	ehe ɛdɯ Ideoph be.careful	‘hey, be careful’
(117)	abudu-p gumɯk-pa mum-ʤi-kpɜ-nbɔ-ŋɔ sore-Adjr Rem-Aff head-Poss-sore-Nmlz.Past-?	‘usually our head gets sore (if we carry something on it)’

Agoutis ludling: rodents: /pi-/ (see Section 4.2.6)

(118)	pi-upa LUD-banana	‘banana’
(119)	taupa	‘banana’
(120)	pi-upa ɜ̃hɜ̃ LUD-banana babbling	‘banana’
(121)	pi-wɔmjum-ɯɾɯ LUD-banana-field	‘banana field’
(122)	pi-nɜɾɜŋ LUD-Ideoph	‘it (the stalk) is hanging straight down’
(123)	tɜːɾik-kom-be gun-it-ta-k-p(a) eɾɔ hɜ̃ big-Pl-Adjr Rem-Aux-always-Aff this babbling	‘they are always big’
(124)	pe-ɾik-kɜm-βɛ LUD-big-Pl-Adjr	‘they are big’
(125)	(pi-ɔ̃) pi-ɔ̃mjum-ɯɾɯ (LUD-) LUD-banana-field	‘banana field’
(126)	pi-tanbə LUD-?	‘?’ (location in the file: 40:0)
(127)	m-enep-tɔme botkɯn 2Erg-bring-Fut very	‘you will bring them (emphatically)’
(128)	n-ipigagun-de-Nmlz-taŋdɯβɯda 3Abs-ripen-Verb-Caus-?	‘let it get ripe (yellow)’
(129)	pi-pigɜ lɜn-ne LUD-? even-only	‘?’ (location in the file: 4:0-4:05)

(130)	pi-nba-(n) lɜn dɜŋ-gɯ LUD-food-(Gen) even be-Imperf	'it was my food'
(131)	nɛ-kuba-p kumɯk-pa LUD-beer-Purp Rem-Aff	'it (the banana) is good for making beer' (different LUD)
(132)	pi-kuba dɜŋ-gɯ LUD-beer be-Imper	'it was beer'
(133)	pi-nba-n LUD-food-Poss	'it was my food'
(134)	ẽɲɛ agreement	'yes, that's right'
(135)	m-etamɯ hũ̃ kəhə̃ 2Erg-? ? ?	'?you …' (location in the file: 4:10)
(136)	lalale mapilɔ ? ?	'?' (location in the file: 4:10-4:15)
(137)	pi-ɾa lɜn bep-tomɛ LUD-? even ?-Fut	'?' (location in the file: 4:15)
(138)	pi-ʧiŋ LUD-?	'?' (location in the file: 4:15-4:20)

Peccary and Dog ludling: /tɔ-/ (see Section 4.2.7)

(139)	tɔ-upa LUD-banana	'banana'
(140)	taupa	'banana'
(141)	tɔ-upa dɜŋ LUD-banana	'it is a banana'
(142)	tɔ-mjum-ɯrɯ-p tɔ-ɾik-kom-be ta(gie) LUD-banan-field-Purp LUD-big-Pl-Adjr very	'the banana field is very big'
(143)	dɔ-nɛɾɛŋ LUD-Ideoph	'it (the stalk) is hanging down'
(144)	taɾik-kom-bɛ gun-it-ta-k-pa eɾɔ big-Pl-Adjr Rem-Aux-always-?-Aff this	'these (bananas) are always very big '
(145)	tɔ-ɾik-kom-bɛ (tɔ-tɔ) tɔ-upɜ LUD-big-Pl-Adjr (LUD-LUD) LUD-banana	'the bananas are big'
(146)	taupa endɔ-dɯ(dɯ)-k-pa-nba edet banana here-PL(Pl)-?-Aff-also name	'what else? banana is its name'
(147)	tɔ-upa lɜn LUD-banana even	'banana itself (is its name)'
(148)	ũ̃ malɜn botkɯn Ideoph enough very	'? yes, that's it (emphatic)'
(149)	lɜnba ɔgɜɾaumɔ wɔ taupa hə̃ also Arara? for banana even	'also for the Arara (its name) is banana'

(150)	ũ malɜn Ideoph enough	'yes, that's it'
(151)	nu-meŋərə kuɾe-p ku(mɯ)k-p(a) uade-koβa-p ?-drink? good-Adjr Rem-Aff ?-beer-Purp	'it has been good …' (location in the file: 4:45)
(152)	tɜɾek tɔn tɔ-wɔːgɯ-rɯ gede-h kiubagan many be? self-drink-Poss 3? ? ?	'there is a lot to be drunk ….' (location in the file: 4:45)
(153)	kobaː eŋ m-enep-tɔmɛ botkɯn ? ? 2Erg-bring-Fut very	'… you will bring it (emphatic) (location in the file: 4:50)'
(154)	inɜmne nɯ-dɔmɛ ĩhĩhĩ ? ?-Fut hesitation	'? …. (location in the file: 4:50-4:55)'
(155)	uktɔmɛninːabɯlɯ tɔtɜnbɔ ? ?	'? ….' (location in the file: 4:55)
(156)	tɔ-gɜlɜn-ne tɜ-ʧiŋ LUD-tomorrow-only LUD-?	'only tomorrow …' (location in the file: 4:55-5:00)

Macaws ludling: /eŋna-/ (see Section 4.2.8)

(157)	en-ɜpɜ̃ hɜ̃ LUD-banana	'banana'
(158)	taupa	'banana'
(159)	en-ɜpã LUD-banana	'banana'
(160)	(eŋ)naɾa-umjum LUD-banana	'banana' (different ludlingant)
(161)	unama-umjum-ɯrɯ-p LUD?-banana-field-Adjr	'it is a banana field'
(162)	malɜn dɜŋ ɔmjum-ɯrɯ-p lɜn-nɯ̃ enough be banana-field-Adjr even-?	'that's right, it is a banana field (emphatically)'
(163)	nep eŋnaɾa-tɜ wadite ? LUD-? how.is.it	'? …., how could it be? (location in the file: 5:10)' (different ludling)
(164)	(iŋ)na-ta-nba LUD?-fetch-also	'you will fetch it'
(165)	hiŋna-ta-n(ba) LUD?-fetch-also	'you will fetch it' (extra [h] in the ludlingant)
(166)	m-et-ta … wɯ-gi-ɜŋ 2Erg-fetch-Dist 1Erg-say-Uni	'I said, "you will fetch it there"' (incomplete sentence)
(167)	nekup neŋnaɾa-kuβa-dandiɜŋ ? ?-	'? …. (location in the file: 5:20)'

(168)	enŋa agreement	‘yes, that’s right’
(169)	m-et-ta mũtkũn 2Erg-fetch-Dist very?	‘you will fetch it (emphatically)’ (incomplete sentence)
(170)	tɔ-nielumeptan-de bɜɾa T-?-Nmlz Neg	‘?’ (location in the file: 5:25)
(171)	inaɾag nɜnɜkomiŋe ? ?	‘?’ (location in the file: 5:25)
(172)	eŋna-kuβa dɜŋ-gɯ-nba LUD-beer be-Imperf-also	‘it is also beer’
(173)	enŋa agreement	‘yes, that’s right’
(174)	ɯnba lɜn ɯ-wɔgɯ-ɾɯ lɜn also even 1Abs-drink-Poss even	‘it is also (emphatic) my drink (emphatic)’
(175)	wadite-βa-nba hə̃ how.is.it-uncertain-also	‘how could it be?’

Toucans ludling: /eŋnaɾa-/ (see Section 4.2.9)

(176)	(eŋ)naɾa-upa hĩ LUD-banana hesitation	‘banana’
(177)	taupa	‘banana’
(178)	(eŋ)naɾa-upa LUD-banana	‘banana’
(179)	eŋnaɾa-dɛ hũ̃ LUD-? hesitation	‘? … (location in the file: 5:40)’
(180)	(eŋ)na-rek-kom-be tahie unaɾa-upɜ ũhũ LUD-big-Pl-Adjr very LUD-banana Ideoph	‘yes, the bananas are very big’ (/unara/ - different ludlingant)
(181)	i-maɾa-ŋma iedadɯt kəbənitək 3Abs-small-Pl ? ?	‘they are small … (location in the file: 5:45)’
(182)	(eŋ)na(ɾa)-lik-kɜm-bə LUD-big-Pl-Adjr	‘they are big’
(183)	(eŋ)naɾa-wɜmjum-ɯɾɯ hũ̃ LUD-banana-field hesitation	‘it is a banana field’
(184)	ɔmjum-ɯɾɯ lɜn mɔɾɔ wanɔ-p-pa banana-field even it what.for-Adjr-uncertain	‘oh boy, it (itself) is a banana field’
(185)	m-enep-tə ndaɾata-nbɜ 2Erg-bring-Dist ?-also	‘you will also bring …’ (location in the file: 5:50-5:55)
(186)	(eŋ)naɾa-ʧiŋ LUD-?	‘?’ (location in the file: 5:55)

(187)	ẽhẽ jumpak Ideoph ?	‘yes, … (location in the file: 5:55)’
(188)	n-ep-tomɜ botkɯn hũ 3-come-Fut very hesitation	‘let him come back’
(189)	(eŋ)naɾa-tɜm (eŋ)naɾa-upa LUD-? LUD-banana	‘… the banana (location in the file: 6:00)’
(190)	ũhũ Ideoph	‘yes, that’s okay (hesitation for: [enŋa])’
(191)	n-akpɯ-t (eŋ)naɾa-kpɯ-t potkɯn 3Abs-ri(pe)-Nmlz LUD-ripe-Nmlz very	‘let it get ripe, very ripe (yellow)’
(192)	ha akpɯ-lɯ wadite-βɜ hũ hesitation ripe-Rec how.is.ti-uncertain ?	‘it got ripe; how could that be?’
(193)	m-et-tɔmɛ botkɯn (eŋ)naɾa-tɜmɜ 2Erg-fetch-Fut very LUD-?	‘you will fetch it (emphatically) … (location in the file: 6:05)’

Spider monkeys ludling: /un-/ (see Section 4.2.10)

(194)	un-aupa LUD-banana	‘banana’
(195)	taupa	‘banana’
(196)	un-aupɜ LUD-banana	‘banana’
(197)	kɜmben nundɛrɛ ? ?	‘?’ (location in the file: 6:15-6:20)
(198)	kɜmbẽn itakpɯerə ũ ? ? hesitation	‘?’ (location in the file: 6:20)
(199)	ɯdɯ un-ɔpa e-ɯnan wɔmjum-ɯrɯ be.careful LUD-banana ?-? banana-field	‘be careful, the banana, … it is a banana field’ (location in the file: 6:20-6:25)
(200)	malon enough	‘that’s okay’
(201)	m-enep-ta-n(bom) 2Erg-bring-Dist-later	‘later you will bring it (from there)’
(202)	num-et-ta-nbɔh LUD?-Fecth-Dist-later	‘later I will bring it’ (different ludlingant; /h/ instead of /m/)
(203)	uŋ-ɯʧĩ LUD-?	‘?’ (location in the file: 6:25-6:30)
(204)	ɛhẽ-(e)ŋɜ Ideoph-agreement	‘yes, that’s right’
(205)	idɜ tet it-tu(p) eliõ… go want Aux-if? ?	‘if s/he wants to go …’

(206)	(ɯ)tɜ tet it-tuh go want Aux-if	‘if s/he wants to go’ (/h/ instead /p/)
(207)	ɯdɔ go	‘go!’
(208)	(w)-ɯdɔ-nɜŋəɾə kɜkɜ 1Erg-go-Prog ?	‘I am going …. (location in the file: 6:30-6:35)’
(209)	un-tɜ lɜn-ne udɜ LUD-go even-only go	‘then go, go! ’
(210)	nɛhɛː Ideoph	‘yes’
(211)	m-et-tomɛ 2Erg-fetch-Fut	‘you will fetch it’
(212)	ɔ-(w)ɔgɯ-ɾɯ lɜn 2Abs-drink-Poss even	‘it (itself) is your drink’
(213)	omʊɾɔ e-wetʃi-(p) moŋ-ne un-ɜmgʊ βɜk you 3-addict-Adjr Aux-Rem LUD-beer on	‘you usually are addicted to beer’
(214)	nə-muɾu waditi tək LUD-beer how ?	‘the other kind of beer, how could that be?’
(215)	ne-wɜgɜ-ɾə LUD?-drink-Poss	‘your drink’
(216)	un-wɔgɜ-ɾɯ dɛhẽ LUD-drink-Poss be-Imperf	‘it was my drink’
(217)	ɔ-wɔgɯ-ɾɯ lɜn wanɔ-p-pa 2Abs-drink-Poss even what.for-Adjr-uncertain	‘your drink (itself), oh boy’
(218)	m-enep-ta-nbom botkɯn 2Erg-bring-Dist-later very	‘later you will bring it (from there)’ (emphatically)
(219)	n-anane tegeɾe hũ LUD-one? very? hesitation	‘only a bit’

Howler monkeys ludling: nasalization of vowels (see Section 4.2.12)

(220)	taupɜ̃	‘banana’
(221)	taupa	‘banana’
(222)	tãũpɜ̃ …	‘banana...’
(223)	wõmj̃ũm naː lɜ̃n hũ banana ? even hesitation	‘it is a/the banana (itself)’
(224)	ne-kom-be an te-k pene big?-Pl-Adjr Rhet be-3 also	‘isn’t it also big? (rhetorical question)’ (variation of pronunciation)
(225)	nɛ-kɜ̃m-b(e) uãː hũɜ̃ tɔ̃ũpɜ̃ big?-Pl?-Adjr Rhet? ? banana	‘isn’t the banana big?’ (variation of pronunciation)
(226)	m-et-tɜmu 2Erg-fetch-Fut	‘you will fetch it’

(227)	ẽː i-et-tã-nbõm Idioph 1Erg-fetch-Dist-later	‘yes, later I will fetch it’ (variation of pronunciation)
(228)	ɔ-wɔgɯ-ɾɯ lɜn paɾu weʧi-(p) 2Abs-drink-Poss even water addict-Adjr moŋ-ne Aux-Rem	‘it is your drink (itself); you usually are addicted to water’
(229)	ɯ̃-wɔgɯ-ɾɯ lɜ̃n hũ 1Abs-drink-Poss even babbling	‘it (itself) is my drink’
(230)	i-et-tã-mbɜm bə 1Erg-fetch-Dist-later ?	‘later I will fetch it’ (/mb/ instead /nb/)
(231)	jẽmẽ n-ĩŋnɔ̃βɯ̃-lɯ̃ mom by-prepare-Rec	‘it is to be prepared by mom’
(232)	hẽɲɜ n-iŋnop-ta-g-a agreement 3Abs-prepare-Perm-Imp-Perm	‘that’s right, let her prepare it’ (new structure: [-ta-g-a])
(233)	wanɔ-p-pa hũ what.for-Adjr-uncertain hesitation	‘oh boy’
(234)	m-enep-tomɛ-wɜ 2Erg-bring-Fut-then	‘then you will bring it’
(235)	ɜ̃ i-et-ta-nbom Ideoph 1Erg-fetch-Dist-later	‘yes, later I will fetch it’
(236)	tɯpu pigen ʧɔŋ ? small? Ideoph?	‘... small …’ (location in the file: 7:25)
(237)	hẽɛ malɜn hũ Ideoph enough hesitation	‘yes, that’s okay’

Land tutles ludling: towards [æ] (see Section 4.2.13)

(238)	tɛɛpæ	‘banana’
(239)	daupa	‘banana’ (voicing process)
(240)	tɛɛpɜ dɜŋ banana be	‘it a is banana’
(241)	wamjum	‘banana’
(242)	tẽːi̯ ga dək have Q be	‘is there any?’ (Portuguese word: *tem* ‘have’)
(243)	tɜmɛ daɾik-kɜm-be una tahik ga dɔk itɛːɾa ? big-Pl-Adjr ? ? Q be ?	‘... big (location in the file: 7:40)’
(244)	keh tæupɜ hesitation banana	‘it is a banana’
(245)	malon	‘that’s okay’
(246)	m-enep-tomɛ ɯ-wɔgɯ-ɾɯ bɯɾa 2Erg-bring-Fut 1Abs-drink-Poss Neg	‘you will bring it; there is nothing for me to drink’
(247)	ɛ-wagɛ-ɾɛ tẽ fadof padua 1Abs-drink-Poss ? ? banana	‘it is my drink ... banana’

(248)	jækoβa beer	‘it is beer’
(249)	enŋa agreement	‘that’s right’
(250)	jakuba-p ku(mɯ)k … kuɾe-p kumɯk-p(ɜ) beer-Purp Rem ? good-Adjr Rem-Aff	‘usually, it is good for making beer’
(251)	i-ɛt-tæ-nbɜm jɛmɛ n-eŋnɜbɯ-lɯ 1Erg-fetch-Dist-later mom by-make-Rec	‘later I will fetch it for mom to make some’

Appendix 5:

Flora and Fauna Identification

In this appendix I present the flora and fauna mentioned in this thesis in alphabetical order by the Arara term. The second column gives an English gloss, the third column a probable (but not certain) scientific identification, and the fourth column the local Portuguese terms. The scientific names are not the result of scientific studies nor were they provided by an expert, but rather based on my personal research using the internet, comparing photographs and descriptions there with my personal experience in the Arara area. They should not be taken as certain identifications but simply as aids for future researchers.

Arara	English Gloss	Scientific names	Portuguese
[abianã]	a peccary	*Tayassu albirostris*	queixada, porco do mato
[adɔ]	a fish	*Pimelodus* sp.	mandi
[amɯ]	head louse	*Pediculus humanus*	piolho
[aɾun]	a howler monkey	*Allouatta* sp.	macaco guariba
[awɯ]	blue-and-yellow macaw	*Ara arauna*	arara canindé
[erin]	a small cicada	Cicadedae	cigarra pequena
[jaɾambi]	Brazilian merganser	*Mergus octosetaceus*	carará, mergulhão
[iebɛɾɛbɯɾɯ]	woodpeckers	Picidae	pica-pau
[jaguɾi]	an agouti	*Dasyprocta* sp.	cutia
[jɔgɔ]	honey, honey bee	*Apis* sp.	mel, abelha
[jɔɾu]	turtoises	*Geochelone* sp.	jabuti
[kagak]	a toucan	*Ramphastos* sp.	tucano
[kajatu]	peach-fronted parakeet	*Aratinga aurea*	periquito maracanã
[kaɾa]	a red and green macaw	*Ara chloropterus*	arara
[kaɾaja]	a scarlet macaw	*Arara macao*	arara vermelha
[kaɾatɔ]	a bootle gourd, gourd container	*Lagenaria* sp.	cabaça
[kaɾaum]	a blue macaw	*Anodorhynchus* sp.	arara azul

[kaɾawa]	non-edible cassava/manioc	*Manihot* sp.	mandioca braba
[kaɾiamɯ̃]	a deer	*Mazama* sp.	veado
[kɔtkɔt]	yellow-rumped cacique	*Cacicus cela*	japu, japurá, rescongo
[kɔʧi]	a leporinus fish	*Leporinus* sp.	piau
[kuba]	an armadillo	*Cabassous unicinctus*	tatu rabo de couro
[kubi]	a fish	Ctenoluciidae	bicudo, caibu, agulhão
[kui]	a parakeet	*Brotogeris* sp.	curica
[kuŋʤi]	a quail	*Odontophorus capoeira*	uru
[kuɾuju]	small squash or gourd	*Cucurbita* sp.	cabacinha
[kutkut]	a night monkey	*Aotus* sp.	macaco da noite
[kutɔ]	a toad	Bufonidae	sapo
[kuʧamit]	a titi monkey	*Callicebus* sp.	macaco zogue-zogue
[kɯden]	sweet manioc/edible cassava	*Manihot* sp.	macacheira, aipim, mandioca doce
[kɯdeɾai ebɯ]	kapok tree	*Ceiba pentranda*	samaúma
[mak kɛni]	muscovy duck	*Cairina maschata*	pato
[manan]	a herbaceous plant	*Ischnosiphon aruma*	arumã
[mɔβɛ]	a fruit	*Spondias mombin*	cajá, taperebá
[mɔɛ]	a toad	Bufonidae	sapo cururu
[muaŋ]	a biting midge	*Culicoides* sp.	maruim
[mulik]	a bird of the cuckoo family	*Crotophaga* sp.	anu preto
[mumbɔ]	a tree/fruit	*Bagassa guianensis*	tatajuba
[mɯdaimɔ]	a large predatory fish	*Hoplias* sp.	trairão
[mɯta]	a small monkey	Callitrichidae	macaco suim
[nabiɔt]	sweet potato	*Ipomoea batatas*	batata doce
[ɔet]	rubber tree	*Hevea brasiliensis*	seringa
[ɔgɔm]	blind snake	*Scolecophidia*	cobra cega
[ɔgum]	wasp	Vespidae	marimbondo
[omiaegu]	a small predatory fish	*Hoplias* sp.	traíra
[onŋon]	cacao tree/fruit	*Theobroma cacao*	cacau
[ɔnon]	the barbasco plant	*Lonchocarpus urucu*	urucu
[ɔɾɛmĩ]	a spotted fish	*Pseudoplaystoma* sp.	surubim
[ɔɾepi]	bare-faced curassow	*Crax fasciolata*	mutum pinima
[ɔɾɔt]	native cashew tree/fruit	*Anacardium* sp.	caju silvestre
[ɔɾɔʧum]	cultivated cashew tree/fruit	*Anacardium* sp.	caju cultivado
[ɔtkɔi'mɔ̃]	giant armadillo	*Priodentes maximus*	tatu canastra
[ɔtpa]	a catfish	*Hoplosternum littorale*	tamoatá, cascudo
[ɔtpidɔ]	an armadillo	Dasypodidae	tatu

[patɯt]	porcupine	*Coendu* sp.	quandu
[pawi]	curassow	Cracidae	mutum
[pɛwit]	a raptor	Falconiforme	gavião
[pilik]	a toucan	*Ramphastos* sp.	tucano
[pɔmũ]	a beetle	Coleoptera	besouro
[ponẽ]	piranha	*Serrasalmus* sp.	piranha
[pɔɾat]	a catfish	*Baryancistrus* sp.	cari, cascudo
[pou]	a small peccary	*Tayassu tajacu*	caititu
[pɯɾɔk]	a parakeet	*Brotogeris* sp.	periquito
[tagi]	cricket	Gryllidae	grilo
[taukara]	inga tree/fruit	Ingeae	ingá
[tawɛ]	capuchin monkey	*Cebus* sp.	macaco prego
[tomgem]	a black biting fly	*Simulium* sp.	pium
[toŋʤiɾi]	a lizard	*Tropidurus* sp.; *Ameiva* sp.	calango
[tɔɾɔmõ]	Brazil nut tree/fruit	*Bertholletia excelsa*	castanha do Pará
[ʧamit]	squirrel monkey	*Saimiri* sp.	macaco mão-de-ouro
[ʧaɾɔktʃaɾɔ]	parrot		papagaio
[ʧiɾɔ]	a toucan	*Ramphastos* sp.	tucano
[ʧiɾuka]	coati	Procyonidae	quati
[tɔdɔ]	a banded leporinus fish	*Anostomidae* sp.	piau listrado
[tudɔ]	an owl	*Strigiformes*	coruja
[tɯapkɔ]	a toucan	*Ramphastos* sp.	tucano
[waga]	a bald vulture	*Cathartidae*	urubu de cabeça pelada
[wagɔ]	a sloth	Folivora	bicho-preguiça
[wagwak]	a bird	*Penelope* sp.	jacu
[wakat]	alligator, cayman	Alligatoridae	jacaré
[walɔ]	a raptor	Falconiforme	gavião
[waŋwa]	a tree	*Cecropia* sp.	embabaúba
[waɾakina]	trumpeter bird	*Psophia* sp.	jacamim
[wauɾi]	a palm tree/fruit	*Oenocarpus* sp.	bacaba
[weɾɔ]	a small wild cat	*Leopardus* sp.	gato maracajá
[wogaɾaum]	a guan bird	*Penelope* sp.	jacu
[wɔŋɔum]	a spider monkey	*Ateles* sp.	macaco capelão
[wotomõ]	tapir	*Tapirus terrestris*	anta
[ɯpɯ]	yam	Dioscoreaceae	cará

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