Aspects of Nchufie Grammar

UCLA Occasional Papers in Linguistics

Volume 14

May 1994

edited by

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Table of Contents

INTRODUCTORY REMARKS

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In the fall quarter of 1991 and the winter quarter of 1992, Dorit Ben-Shalom, Dani Byrd, Jongho Jun, Karn King, Luc Moritz, Murat Kural, Michael Nkemnji, Akira Nakamura, Seungho Nam, Tetsuya Sano, Dan Silverman, and Kelly Stack participated in a field methods class in which we studied Nchufie under my direction. This volume brings together nine papers written in the context of our class.[1]

Nchufie,[2] also referred to as Bafanji, is a Grassfield Bantu language of the Nun group in the Mbam-Nkam family, spoken in North Western Cameroon. There is no previously published material on Nchufie. We worked with a native speaker, Sophie Ajeakwa, who grew up in the village of Bafanji.

My introduction consists of two parts. In the first part, I provide some background information on Ncufie, which helps place the individual papers in context. In the second part, I discuss some phenomena which are not dealt with in any of the individual papers included in this volume.

1. Background

1.1. Segments

The phonetic segment inventory of Nchufie as presented in Dani Byrd's article (this volume), is reproduced here as Table 1[3] (segments in parentheses are not phonemes).

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[1]That this volume comes together is due to the persistence and energy of Murat Kural.

[2]Ncufie is a frozen form for which the following etymology was volunteered:

fiẹ	people/inhabitants of Bafanji.
cufie	language of the people of Bafanji.
n cu cufie	I speak cufie.

[3]See also Dan Silverman's paper (this volume).

Table 1. Consonants:

	labial	labio-dental	dental	post-alveolar	palatal	velar	labialized velar	labial-velar
plosives	p^h p		t^h t			k^h	k^w	
affricates			tʃ dʒ					
nasals	m	(ɱ)	n		(ɲ)	ŋ	(ŋ^w)	
prenasalized	(mb)		(nd)	(ndʒ)		ŋg	(ŋg^w)	
fricatives		f (v)	s z			ɣ	(ɣ^w)	
approximants			l		j			w

Several comments are in order:

(i) Aspiration in voiced stops is contrastive, except at the velar place. A distribution of aspiration suggests that unaspirated *p* corresponds to Bantu **b*. We have not investigated this issue in any detail.

(ii) *k* lenites to *g/ɣ* intervocalically.

(iii) There are no voiced stops (*b, d, g*);

(iv) Prenazalized consonants (*mb, nd, ndʒ, ŋg*) and onset clusters of nasal plus voiceless plosives or affricates (*mp, nt, ntʃ*) occur in onset position. Prenasalized consonants occur in nonderived contexts in nouns and in derived contexts elsewhere. Jongho Jun and Dan Silverman regard prenasalized consonants as derived from two segments. Segmental processes involved in the derivation of prenasalized consonants are discussed and analyzed in a paper by Jongho Jun, which is not included in the present volume,[4] and by Dan Silverman's *Optional and Obligatory Prenalization in Nchufie Reduplication* (this volume). Silverman's article more specifically focuses on prenasalization in derived and underived contexts, and discovers an asymmetry between segments, which shows up in reduplicated adjectives in predicate nominal constructions. While onsets of adjectives can optionally be prenasalized in a particular syntactic environment (past tense), reduplicated adjectives with a fricative consonant in their onset may not. Yet, as Silverman points out, fricatives in morphologically nonderived contexts can be prenasalized, although they do not appear in non-derived contexts. Silverman explores an explanation for this asymmetry within several theoretical proposals.

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[4]Jongho Jun (to appear) 'An analysis of Bafanji Prenasalized Consonants,' *Linguistics in the Morning Calm* 3, Seoul: Hanshin. This article discusses superficially idiosyncratic properties of prenasalized consonants in Nchufie, and argues that there are no phonemic prenasalized consonants. A formal analysis in the framework of Aperture Theory is presented.

(v) As opposed to other Grassfield languages, Ncufie has no phonetic glottal stop *ʔ*. While we initially transcribed sequences *sɔ̰ɔ̰* 'beautiful' with a glottal stop in coda position (*sɔ̰ʔ*), spectrographic analysis showed that no glottal stop was produced: rather a long vowel was realized with creaky voice. Spectrographic analysis of related words in Nweh, Michael Nkemnji's native language, clearly showed the presence of glottal stops in his speech. Creaky voice is only found on long vowels. This strongly suggests a relation to CVʔ syllables.

(vi) The voiced fricative *v* is an allophone of *w* (see below for more discussion), and so far is found only in two words in very defined phonological environments (as initial C of CvGV syllables):

(1) a. [vɯgɯ] 'our' (from /w + ɯɯ / (see section 2.1 below)
b. [vəgə] 'to spank, to beat'

(vii) The labialized velar *ɣ(w)* is an allophone of w before round vowels (see below for more details):

(2) [ɣo] (from: /w+o/)
sgAgr+3PL
'their ..'

1.2. Vowels

We have encountered the following vowels:

(3)

i	ɯ		u
e			o
	ɛ	ə	ɔ
	a	ɐ	

It was standard practice in our class to reduce the vowel system to three vowel heights and front, central and back vowels. We treated *ɛ* and *ɔ* as allophones of *e* and *o*, with *ɛ* and *ɔ* appearing in closed syllables, and *e* and *o* in open syllables. I represent a more conservative view here, since I do not believe that we have sufficiently investigated this matter: *ɛ* and *ɔ* also appear as long vowels, in open syllables, and as second member of a diphthong (for possible diphthongs, see section 2 below). The third person possessive pronoun *ɛ* (see discussion below) alternates between *e/i* depending on the phonological environment. Nasalization is contrastive and can occur with creaky voice.

1.3. Syllables

The canonical shape of the syllable is CV(V). Of interest is the existence of two types of syllables that do not fit into this template: CvGV[5] and CVŋ (*ŋ* is the only coda consonant allowed). No article in this volume specifically addresses these questions.[6] However, since we have some insights into the distribution of these syllables and how they fit into the general syllable structure, I include a discussion in the second part of the introduction and present arguments that syllables of the form CvGV can be reduced to syllables of the form CɯV, with a process of devocalisation of *ɯ* to *g*, and insertion of an epenthetical vowel to separate C from *g*. The velar nasal in coda position can be derived from the high nasalized central vowel *ɯ* or the high nasalized back vowel *u* by a rule of devocalization, as proposed by Dorit Ben-Shalom.

1.4. Tones

Like other Grassfield languages, Nchufie is a tone language. This is the area where we encountered the greatest difficulties: simply establishing the tonal patterns proved extremely challenging. We have distinguished three lexical tones, L(ow), M(id) and H(igh). In addition, SuperL(ow) and SuperH(igh) appear in certain well-defined syntactic environments (SuperL in the object reversal, and SuperH in past tense). The opacity of the tonal system is due to the existence of floating lexical tones, and to tonal properties of morphosyntactic categories. This volume contains three articles on tones. Dani Byrd presents a preliminary phonetic description of yes-no question formation in *Pitch and Duration of Yes-No Questions in Nchufie*. Question formation involves lengthening of the final rhyme, and prosodic features, which she shows, involve higher pitch range used in questions. Thus lexical mids and high tones are realized significantly higher than in corresponding statements, while no change is observed for low tones. In addition, an optional final low tone can follow a high tone in questions.

Dorit Ben-Shalom describes and analyzes the quite complex tonal patterns of monosyllabic verbs in *The Tones of Nchufie Verbal Inflection*. Monosyllabic verbs, she argues, fall into two basic tonal classes: verbs with no underlying tone and low toned verbs. Tonal patterns arise from the interaction with tonal melodies of particular tenses

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[5]The velar consonant in this type of syllable is realized either as a velar fricative *γ* or a velar stop. I will refer to this type of syllable uniformly as CvGV.

[6]The formal phonological aspects of CvGV syllables are more fully developed in Kelly Stack's article for the class, and the status of CVŋ syllables in Dorit Ben-Shalom's. Neither is included in the present volume.

and moods. Michael Nkemnji's *Aspects of the Morpho-syntax of Nchufie Nominals* discusses tonal patterns on nouns and in the associative construction in NPs.

1.5. Morphosyntax

The morphosyntax of Nchufie nominals, probably the most studied subject in Grassfield Bantu languages, are discussed in Michael Nkemji's article. Discussion of morphosyntactic properties is scattered throughout the papers in this volume.

1.6. Syntax

Nchufie is a head initial language. Several aspects of the syntax are covered in this volume. Luc Moritz in *The Facts of Nchufie DPs: A Report* describes the properties of the Nchufie DPs, and focuses on the distributional and structural properties of the different elements within DPs. Seungho Nam's *Negation in Nchufie* describes the different types of negation in Nchufie, whose form varies with sentence types and moods. Tetsuya Sano's *Resumptive pronouns in Nchufie, the ECP and the Least-Effort Condition* describes relative clauses and addresses the problem of how to account for the nature and appearence of resumptive pronouns. Akira Nakamura's *On Wh-Questions in Nchufie* and Murat Kural and Luc Moritz's *Nchufie Wh-in-situ and Locality* deal with different types and aspects of wh-questions. Nakamura focuses on wh-questions where the subject is questioned, and verb doubling occurs. Kural and Moritz describe and analyze the wh-in-situ construction, which differs in a crucial respect from the well-studied wh-in-situ construction in languages like Chinese and Japanese: wh-words can roughly only be in-situ in a position from which overt extraction is possible. I will add one particular section on the construction that I will call object preposing which is not covered in this volume.[7]

2. Description

2.1. CvGV syllables

As mentioned in 1.3, CvGV syllables do not appear to fit into the general syllable template. I will now present arguments that they in fact do.

CvGV syllables behave as monosyllabic syllables, as can be concluded from their behavior with respect to the process of adjectival reduplication discussed by Silverman (this volume). Monosyllabic, but not bisyllabic, adjectives reduplicate under adjectival reduplication. CvGV adjectives reduplicate, and thus pattern with monosyllabic

[7]The discussion is based in part on Karn King's paper for the class.

adjectives, not with bisyllabic syllables. This raises the question what kind of monosyllabic syllables CvGV syllables are. There are three arguments for deriving CvGV syllables from CɯV syllables. The first two arguments are due to Kelly Stack. The first argument is distributional: ɯV and vGV are in complementary distribution, with ɯV <u>only</u> occurring after velar consonants, and CvGV <u>only</u> occurring after non-velar consonants. This suggests a common underlying structure for both surface forms. Since the sequence ɯV directly fits into the general syllabic template, it is natural to postulate CɯV as the underlying form, and derive CvGV from CɯV forms after non-velar consonants. The second argument is based on the fact that our speaker, when asked by Kelly Stack for possible words, like *zɯi*, volunteered forms like *zɯgɯ*. The third argument is based on the form of the first person pronoun possessive. In order to make this argument, I need to present a general analysis of the phonology and morphology of the paradigm of possessive pronouns. This paradigm was established quite early in the first quarter, and I presented an analysis of it at that time as an illustration of the fact that much insight is to be gained into the propperties of a particular language by doing an in-depth analysis of a particular paradigm even at a point where one knows frightfully little about the language as a whole.

Possessive pronouns are composed of a lexical stem preceded by a prefix that agrees with the head noun in number and class. I depart from the standard practice in the literature on Grassfield Bantu languages and do not identify noun classes by numbers, but rather by the phonological shape of the agreement prefix, yielding two singular classes (*w* and *j/z*) and two plural classes (*p* and *m*) (for a discussion of noun classes in Nchufie, see the article by Michael Nkemnji in this volume). Asymmetric forms, which I particularly focus on below, appear in shaded boxes.

Table 2. Possessive pronouns:

	w (sg)	**j/z (sg)**	**p (plural)**	**m (plural)**
1S	wɔ	jɔ	pɔgɔ	mɔŋɔ
2S	ɔ	ɔ	pɔ	mɔ
3S	ɛ	ɛ	pɛ	mɛ
1P (inclusive)	wi̯ɛ̯	ji̯ɛ̯	pi̯ɛ̯	mi̯ɛ̯
1P (exclusive)	vɯgɯ	zɯgɯ	pɯgɯ	mɯŋɯ
1P (dual)	wu̯u̯	ju̯u̯	pu̯u̯	mu̯u̯
2P	waĩ	zaĩ	paĩ	maĩ
3P	ɣ^{w}o	zo	po	mo

The determination of the form of the pronominal stem raises several analytical problems. I will start with the transparent cases: the paradigms of plural pronouns, with the exception of first person inclusive and dual. These paradigms are entirely regular. The lexical roots can be constructed straightforwardly as in (4):

(4)

1P (exclusive)	-ɯgɯ
2P	-aĩ
3P	-o

Prefixation of the agreement consonant yields the correct surface form, except for the first person plural exclusive in the *w* class, which does not have the expected form **wɯgɯ*. In order to account for the change of *w* to *v* before the pronominal root -*ɯgɯ*, a process of hardening of *w* to *v* before a velar consonant must be assumed, yielding *vɯgɯ*. It is of course possible to treat the only other instances of *v* that we have encountered (see section 1b) as resulting from hardening of *w* to *v* as well. In addition, a process of nasal spreading must be assumed in order to account for the appearence of the nasal velar in the first person plural exclusive pronoun in the *m* class.

Consider the *j/z* class next. This class is mixed, and might very well have resulted historically from the merger of two noun classes, characterized by the *z* or *j* prefix. But if there were two prefixes historically, there should have been two full paradigms historically. Since this is not the case synchronically, the question arises if or how gaps in in the paradigms can be explained.

(5)

	j	z
1S	jə	*zə
2S	ɔ * jɔ	*zɔ
3S	ɛ *jɛ	*zɛ
1P (inclusive)	jiɛ̰	*ziɛ̰
1P (exclusive)	*jɯgɯ	zɯgɯ
1P (dual)	jʉʉ̰	zʉʉ̰
2P	*jaĩ	zaĩ
3P	*jo	zo

I don't have anything to say about the gaps in the z paradigm. *zɔ* and *zɛ* exist as strong pronominal forms for second and third person in the focus construction discussed below and in Nakamura (this volume). It is therefore unlikely that these forms are excluded for any principled reason. However, there is a generalization that emerges. If the first person plural inclusive (we as a group), and dual are characterized by a singular number feature, a not unreasonable assumption given its semantics, pronouns with plural number can be characterized as selecting the *z* prefix, and pronouns with singular pronouns as selecting the *j* or a zero prefix. Blocking could then be invoked to account for the impossibility of plural forms with the prefix *j* and singular forms with *z*. This basically leaves the gaps within the *j* paradigm. Why are second and third person singular possessive pronouns not preceded by the agreement prefix *j* ?Why are the forms in (6) excluded?

(6) *jɔ, *jɛ

This is in fact not a problem restricted to the *j* class, as an inspection of the paradigm of second and third person singular pronouns in table 2 above shows. Contrary to the *p* and *m* classes, no overt agreement prefix precedes these pronominal roots in the *w* class either. The question is thus more general: why do second and third person behave differently? What excludes the expected, but unattested forms in (7):

(7)

	w	j/z	p	m
2S	ɔ *wɔ	ɔ *jɔ	pɔ	mɔ
3S	ɛ *wɛ	ɛ *jɛ	pɛ	mɛ

Suppose that this asymmetry is not accidental, but that the starred forms in (7) are excluded for phonological reasons. Assume more particularly, that *w* and *j* may not

surface in this particular environment, as is supported by the general absence of the sequences in (8).

(8) *wɔ, *jɔ, *wɛ, *jɛ

I assume that there is a process of diphthong simplification in Nchufie that I shall not attempt to formalize, which accounts for the absence of the high initial segment in the contexts mentioned above:

(9) Simplify Diphthong

Diphthong simplification could either simplify the output of agreement prefix and stem, or act as a filter and prevent the prefix from attaching to the pronominal root, in which case the pronominal stem surfaces without any agreement prefix.[8]

If this analysis is correct, the pronominal roots for second and third person are *ɔ* and *ɛ* respectively.

(10) second person: -ɔ
third person: -ɛ

All pronominal roots have now been constructed, except for the first person singular. In this case, simply separating the agreement consonant from either the singular or the plural form will not yield the stem. Thus, taking the root to be either-*ə* (*wə* - *w* = *ə*) or -*əgə* (*pəgə* - *p* = *əgə*) raises problems. Consider first the problems that arise if the root were *ə*. Given what we know about the formation of possessive pronouns, the plural forms should be *pə* and *mə*. But this is incorrect. This hypothesis cannot account for the appearance of the velar stop after the agreement prefix in plural forms, and therefore the root of the singular pronoun cannot be-*ə*. Similar problems arise if the root is ˇ-*əgə*. This assumption leads to problems as well, since the singular form should be *w* + *əgə*., with hardening yielding the surface form **vəgə*. This form is clearly not excluded for any principled reason: it exists and means 'to beat, spank', (1b) .

The analytical problem thus lies in finding an account both for the appearance of the velar fricative/stop in the plural and for the absence of this stop in the singular. This is where the problem of the status of CvGV syllables comes in. Recall that CvGV syllables behave as monosyllables, and that the sequence vGV is in complementary distribution with ɯV. This complementary distribution can be explained if vGV sequences derive from

[8]It is probably this same constraint that is responsible for the weakening of the labial features of the labial velar *w* to a rounded the velar fricative *ɣ*, yielding the surface form *ɣo* rather than *wo* for the third person plural pronoun in the *w*-class (see example (2) above).

underlying ɯV sequences. Thus, plural *pəgə* derives from *pɯə,* and the root for first person can be constructed as *ɯə.* This yields the following underlying forms for the first pronoun in the singular *w* and *j* classes and the plural *p* and *m* classes:

(11) Underlying forms for first person possessive pronoun:

a.	w class	wɯə
b.	j/z class	jɯə
c.	m class	mɯə
d.	p class	pɯə

None of these forms surface as such. The sequences in (11a) and (11b) must subsequently reduce to *wə* and *jə.* Since the agreement prefix is present in the *j* class,[9] it cannot be assumed that it is simply absent. Rather, it must be assumed that the central vowel is deleted. I assume that a proper formulation of Simplify Diphthong achieves the desired simplification. This analysis is supported by the absence of the surface **wɯə* or **jɯə.* In sum, the singular forms derive by the deletion of the high central vowel after *w/j.* For the plural forms it must be assumed that Simplify Diphthong does not apply. Instead *ɯ* devocalizes to *g*, and a short epenthetical vowel is inserted.[10] In addition *g* is realized as a velar nasal under the influence of the initial nasal consonant:

(12)

		P-class	M-class
	Underlying forms:	pɯə	mɯə
a.	devocalisation:	pgə	mgə
b.	vowel insertion:	pəgə	məgə
c.	nasal spreading:	----	məŋə

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[9]There is a good number of cases in our data where the agreement consonant appears to be *w* instead of j. We have concluded from these cases that the j/z agreement class was loosing ground. Interesting, however, in our data these cases were always first person pronoun. In fact, we often rechecked the agreement class for a different person, in which case we would get consistent results (i.e. only j/z forms). We were most likely wrong in our interpretation of the variation. Our discussion so far suggest that there might in fact be a purely phonological explanation. The initial w is not at all indicative of the agreement consonant, but rather reflects the underlying form of the pronoun (as with second and third person pronouns):

(i) j+ ɯə → [jə]

(ii) ɯə → [wə,]

This would yield a straightforward account of why this phenomena seems to be restricted to first person singular.

[10] The following surface forms correspond to underlying sequences. The duration of the epenthetical seems quite short, and the vowel is slightly reduced:

The pronominal paradigm thus provides evidence for the fact that vGV syllables actually derive from underlying diphthongs.[11] In addition, a careful analysis of the pronominal paradigm yields evidence for hardening of *w* to *v* before velar consonants, Simplify Diphthong, the devocalization of the high central vowel to a velar fricative/stop, and the realization of the high central vowel as a velar nasal in the context of nasalization.

2.2. CVŋ syllables

I turn next to the other surface syllable that does not does fit into the CV(V) template, i.e., the CVŋ syllables. The only coda consonant permitted is the velar nasal Vŋ. Dorit Ben-Shalom has proposed that this coda is derived from the high nasalized central vowel *ɯ̃* or the high back vowel *u* by a rule of devocalization. The pronominal paradigm discussed so far has already given us one piece of evidence for a source of N: an underlying *ɯ̃* devocalizes and nasalizes in the environment of a nasal. This process must be assumed for the plural *m*-class (cf (12), repreated here as (13):

(13)

		M-class
	Underlying forms:	mɯ̃ə
a.	devocalization:	mgə
b.	vowel insertion:	məgə
c.	nasal spreading	məŋə

Support for deriving the velar nasal *ŋ* from a high nasalized central vowel or a high back vowel mostly comes from the distribution of diphthongs ending in a high vowel. The following surface forms are attested:

(14)

a.	lei	'want'
b.	ntou	'six'
c.	ʏəɯ	'go'
d.	*Cai	
e.	*Cau	

As indicated in (14), *ai* and *au* do not occur. In addition to the forms in (14), there is one combination of a low V followed by a high front vowel that is obligatorily nasalized:

(i)

/cɯi/	/dɯɛ/	/kɯɯ/	/pɯə/	/pɯa/	/sɯu/	/pɯɔ/
[cigi]	[digɛ]	[kɯɯ]	[pigə]	[piga]	[sugu]	[pugɔ]
push	hide	pot	mine	mad	pull	beauty

[11]The analysis raises the following problem. If all vGV sequences reduce to *ɯ̃ə*, it must be insured that Simplify Diphthong applies to first person singular possessive pronouns *w* + *ɯ̃ə*, but not to the first person plural possessive pronoun (*w* + *ɯ̃ɯ̃*) because this would yield the wrong surface form (**wɯ̃*). I assume that the underlying sequence matters here: *ɯ̃ɯ̃* versus *ɯ̃ə*.

(15) pai̇̃ 'children'

I assume that *ei* and *ai* are the same diphthong, and that *e* is lowered to *a* when followed by a nasal. Given (15), the question immediately arises why the sequences in (16) do not exist:

(16) *Caũ or *Caũ̈

It is in this gap that CVŋ syllables fit. Where nasalized diphthongs ending in high central or back vowels are expected, CVŋ forms occur (the gap in mid vowels is explained if these vowels lower before a nasal):

(17)

	front	central	back
high	niŋ 'animal'	pɯŋ 'people'	zuŋ 'yesterday, tomorrow'
mid			
low		taŋ 'cow'	sɔŋ 'friend'

Additional evidence for the derivation of CVŋ from underlying high back or central vowels comes from Simplify Diphthong: nasalized high back vowels undergo diphthong simplification, just like high back vowels do. The example below demonstrates that the appearence of the third person pronominal object -*ɛ* causes the disappereance of the high central vowel:

(18) a. ma njəɯ kɛɛŋɔ zuŋ
I-PST N-see Keengo yesterday

b. ma njəe zuŋ
I -PST N-saw-her yesterday

c. zəɯ + e → zəe
see + him/her

Nasal codas undergo the same process:

(19) a. ma ntuŋ kɛɛŋɔ
I-PST N-push Keengo

b. ma ntɔ̃e
I-PST N-push-her

c. tuŋ + e → tɔ̃e
push + her/him

This process thus provides additional support for the derivation of nasal codas from high back and central nasalized vowels.

2.3. Object preposing

In this final section, I include a preliminary description of a construction in which the object precedes the subject.[12] I refer to this construction as Object Preposing. Examples, which are presented below, have consistently been translated as passives in our database. I depart from this custom however, since this construction shares only some of the properties of English passives: the preposing of an object to some A-position. In the following examples, SH and SL refer to SuperH and SuperL tones respectively.

(20) a. nki niŋ ma
water-SH-PST N-drink-SL I-FOC
'Water I drank'

b. aa niŋ ma niŋ ŋki
it-SH-PST N-drink-SL I-FOC drink water
'I drank water' (answer to the question 'who drank water?')

c. ŋki niŋ ma niŋ
water-SH N-drink-SL I-FOC drink-it
'I drank water'

d. kɛɛŋɔ$_i$ ntuŋ piincu ntɔ̃e$_i$
Keengo-SH-PST N-push-SL Pinchu N-push-her
'Keengo pushed Pinchu'

I will discuss the properties of this construction referring to the schema in (21):

(21) DP$_i$ PST V-LT DP$_S$ (n-V-pronoun$_i$)

(i) The construction is restricted to past tense (the SuperH tone is a manifestation of past tense, and so is the n-prefix that precedes the inflected verb).

(ii) The inflected verb surfaces with an additional SuperL tonal suffix. This suffix seems to be construction specific and occurs only when a full DP occurs in the initial position. Thus, there is a link between the appearance of the low tone on V and the obligatory preposing of the object to a position higher than the subject. Although it is tempting to analyze the low tone as being related to Agr-O with V incorporating to it, this raises a problem with respect to verb doubling, and obligatory doubling of the DP in these cases.

(iii) The subject appears in the position where focused subjects and wh-in-situ subjects appear in root clauses. There is a special paradigm for focused pronouns. Focused pronouns differ from nominative, accusative, and possessive pronouns, but appear identical to oblique pronouns:

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[12]Most examples of this construction have been gathered by Karn King.

(22)

	Nominative	Accusative[13]	Focus (subject)	Oblique
1S	n/ma	wə	ma	ma
2S	ɔ	ɔ	zɔ	zɔ
3S	a	ɛ	zɛ	zɛ
1P (inclusive)	piɛ̱	wiɛ̱	piɛ̱	piɛ̱
1P (exclusive)	pg	wəgə	pg	pg
1P (dual)	pu̱u̱	wu̱u̱	pu̱u̱	pu̱u̱
2P	pai̱	wai̱	pai̱	pai̱
3P	po	ɣo	po	po

The focused subject is therefore not in [Spec, AgrS], [Spec, AgrO], or [Spec, AgrN].

(iv) The construction can be embedded under a raising verb, as in (23) ('be early' acts like a verb taking a clausal complement):

(23) ndigɛ mfiɛ̱ ndʒə piincu njəɯ
house N-be-early-LT N-see Pinchu see-it
'Pinchu saw the house early'

It seems that the construction specific low tone appears on the raising verb, although our data are not consistent on this point. Interestingly, the raising verb cannot undergo doubling with the thematic verb. We have no data to show if object preposing can occur out of a tensed complement CP.

(v) The subject is obligatory. This construction is unlike the English passive in this respect.

(vi) The construction alternates with a verb doubling construction (20b), in which the initial position is realized by an expletive subject. Since the preposed object and the expletive subject are in complementary distribution, they can be said to occupy the same syntactic position.

(vi) The verb must redouble if the object is a potential agent, otherwise redoubling is optional:

[13]Accusative pronouns are identical to possessive pronouns agreeing with a singular N of the *w*-class. Plural nominative pronouns have a *p*- prefix, related of course to Bantu *ba*-.

(24) a. ŋki niŋ ma (nniŋ)
water-PST N-drink-LT I (drink-it)[14]

b. keeŋɔ njə mạ *(njəe)
Keengo-PST N-see-LT I saw-her

(vii) The preposed DP in our data is always specific, and interpreted as an internal argument (basically theme). It cannot be a wh-phrase, or a PP. However, we have no data which allow us to establish if it can or cannot correspond to a benefective DP or a dative DP in the double object construction, nor if it can correspond to the argument of a stranded P.

(viii) When the verb is redoubled, the preposed DP must be doubled by a resumptive pronoun. This pronoun is in fact visible only if the objects are animate. The pronominal form for inanimate objects is a null pronoun.

(viii) We have no data on the behavior of reflexive anaphors in this construction, nor do we have any clear data on Weak Crossover.

[14]Inanimate objects are segmentally null.

PITCH AND DURATION OF YES-NO QUESTIONS IN NCHUFIE*

Dani Byrd

1. Introduction

This paper will present a preliminary phonetic description of yes-no questions in Nchufie (also known as Bafanji), a Grassfields Bantoid language of the Nun group in the Mbam-Nkam family spoken in Northwestern Cameroon by approximately 8,500 people (Grimes 1988). As there is no published description of this language, a very brief review of the Nchufie segment inventory will be in order. Following this, an instrumental description of the yes-no questions in the language will be presented, focusing on the prosodic cues of duration and pitch. Of special interest will be the interaction of intonation with lexical tone and the representation and cross-linguistic significance of Nchufie yes-no question formation. Below is a brief description of the phonetic segment inventory of Nchufie. Due to the complexities of Nchufie phonology and tonology, the following description should be considered preliminary only; the details are not well understood.

1.1. Consonants

The surface consonants are shown in the chart below. Aspiration is contrastive in stops, except at the velar place. The dental stops are articulated laminally. The voiced velar fricative shown alternates with [g], and a palato-alveolar fricative alternates with the alveolar fricative before high vowels. The velar nasal is the *only* coda consonant permitted. Onset clusters of nasal plus voiceless stop also occur. Because of complications with creaky voice—treated as a property of vowels here—the status of ʔ, if present at all, is unclear.

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* This paper was originally published in the *Journal of the International Phonetic Association* 1992, 22:1/2, pp. 12-26. It has been included in this volume with permission.

	labial	labio-dental	dental	post-alveolar	palatal	velar	labialized velar	labial-velar
plosives	pʰ p		tʰ t			kʰ	kʷ	
affricates				t͡ʃ d͡ʒ				
nasals	m	ɱ	n		ɲ	ŋ	ŋʷ	
prenasalized	mb		nd	ndʒ		ŋg	ŋgʷ	
fricatives		f v	s z			ɣ	ɣʷ	
approximants			l		j			w

1.2. Vowels

The language has three vowel heights and front, central, and back places of articulation. The back vowels are rounded and the front and central unrounded. These vowels will be transcribed: i, e, a; ɯ, ə, ɑ; u, o, ɔ ([i] alternates with [ɪ] in closed syllables). Vowels may be contrastively nasal and oral, long and short, and, if long, have creaky and modal phonation types. Only short vowels may occur in closed syllables. The diphthongs [uɔ], [ɑi], [ɯə], and [ie] also occur.

1.3. Tones

Four tonal patterns occur on monosyllabic lexical items. These are a level high tone (represented here as H), a level low tone (represented as L), a falling pattern (represented as HL), and a rising pattern (represented as LH). The nasal portions of prenasalized consonants always occur with a low pitch in lexical items. This low pitch plays no role in the tonology. Mid and superhigh occur in particular syntactic constructions, for example, superhigh occurs in the past tense construction. Downstepped highs also occur, for example in some cases of adjacent highs. No claims as to the phonological units involved are intended in the following phonetic study of yes-no questions.

1.4. Question marking

A language's yes-no questions may be marked morphologically, syntactically, intonationally, or by some combination of these mechanisms. When marked intonationally, this kind of question generally has either a terminal rise or a higher overall fundamental frequency. In a sample of 53 languages, Ultan (1978, cited in Shen 1991)

found that 71.7% had a rising intonation and 34% had an overall higher F0 in yes-no questions. Only 5.7% had a falling contour (Ultan 1978). In Nchufie, yes-no questions are not marked segmentally but rather marked by intonation and localized lengthening. I will suggest that Nchufie presents a case of question marking which is very unusual in the world's languages. First, final lengthening is the most salient feature marking a yes-no question; the final rhyme in the question domain is lengthened almost 70% compared to the declarative statement. Secondly, Nchufie shows two intonational mechanisms at work. In the question, a higher pitch range occurs which is distinct from a final rise or high raising (upstep), and from an overall higher F0, as phrase final lexical low tones are not affected. Most interestingly, in the question we see an optional final lowering of phrase final high tones. While this is a preliminary study on a language never previously examined, the data suggest that Nchufie is an important language in the investigation of universals of the formation of yes-no questions. Finally a brief discussion of apparently similar data in Hausa and problems for future research will be presented.

2. Method

2.1. Data Collection

Monosyllabic, modal voice nouns were selected as target words and inserted in the carrier phrase [ā ɣé ____], meaning either "He has a ____" or "Does he have ____ ?" depending on whether it is spoken with statement intonation or question intonation. The nouns included all four tonal patterns: H, L, HL, and LH, and all possible rhyme types: CV, CV_1V_2, CVN, and CV_1V_1. The target words used in this experiment are shown in Table 1. A fully balanced set could not be obtained with the lexical data collected thus far within the constraints of monosyllabicity and modal voice. These constraints were applied in order to minimize variation in the interaction of lexical and intonational tone and to simplify automatic pitch tracking.

	CV		CV_1V_2		CVN		CVV	
H	tʰɯ	'tree'	muɔ	'fire'	kɯŋ	'ant'	lɑɑ	'lamp'
	ndʒwi	'cloth			kɔŋ	'bed'		
	mɑ	'mother'			sɔŋ	'friend'		
					ŋʷɪŋ	'machete		
L	ntʃɔ	'mouth'	fuɔ	'chief'	pɯŋ	'stomach'	kɔɔ	'foot'
	ŋgɔ̃	'stranger'	fuɔ̃	'key	nɪŋ	'animal	kɯɯ	'barn'
	ŋkɔ	'box'					pɛ̃ɛ̃	'bag'
LH	ŋki	'water'	fuɔ	'leaf'	ŋgɯŋ	'corn'	ŋgʷɔ̃ɔ̃	'plaintain'
	kɯ	'pot'	fuɔ	'medicine'	ndʒɪŋ	'brother'		
	ŋkũ	'back'			zɪŋ	'brothers'		
HL	ndʒə	'egg'	pʰuɔ	'arm'	pɯŋ	'breast'	mee	'child'
	li	'name'	ŋkɯə	'bush'	mbɯŋ	'money'	lii	'eye'
	pʰu	'ashes'	ndie	'neck'	lɯŋ	'tongue'	ɲɔ̃ɔ̃	'thing'
	ŋkʷe	'firewood'					kɯɯ	'dish'
							too	'ear'

Table 1. Target words used, arranged by rhyme type and tone pattern.

The resulting 43 sentences were randomized and recorded in blocks first as declarative statements and then as yes-no questions, with the speaker being prompted by a written English translation of each sentence. The sentences were recorded in blocks of statements and questions so that no overt contrast effects were produced by the speaker. A female speaker raised speaking Nchufie in Cameroon was recorded in a sound insulated booth. Each target word was recorded only once in each condition as the intended independent variables in evaluating F0 and duration were lexical tone and rhyme type.

2.2. Acoustic Analysis

Pitch tracking was done on the digitized sentences using the Kay Computer Speech Lab (CSL) package. Pitch synchronous pitch tracking was used by first employing the automatic peak picking capabilities of CSL which marks the division between each voicing impulse in the waveform immediately following positive-going zero crossings that precede the first positive-going amplitude peak of the voicing impulses. The process

separates the voiced signal into its periodic components, the inverse of each period being the fundamental frequency (F0) of the signal. Peak picking was done with a 25 ms window and a 20 ms frame advance with a specified range of 50 - 300 Hz. The minimum peak threshold was lowered for target rhymes ending in a coda nasal or a nasalized vowel due to the decreased amplitude. However, the same threshold was always used for a word for both statement and question. Impulse marks were checked by hand and missing divisions added. The pitch tracking function of CSL extracts the fundamental frequency values by computing the inverse of the time between each marked peak. Sample pitch tracks of the statement condition for four CV target words, one from each of the tonal patterns, are shown below.

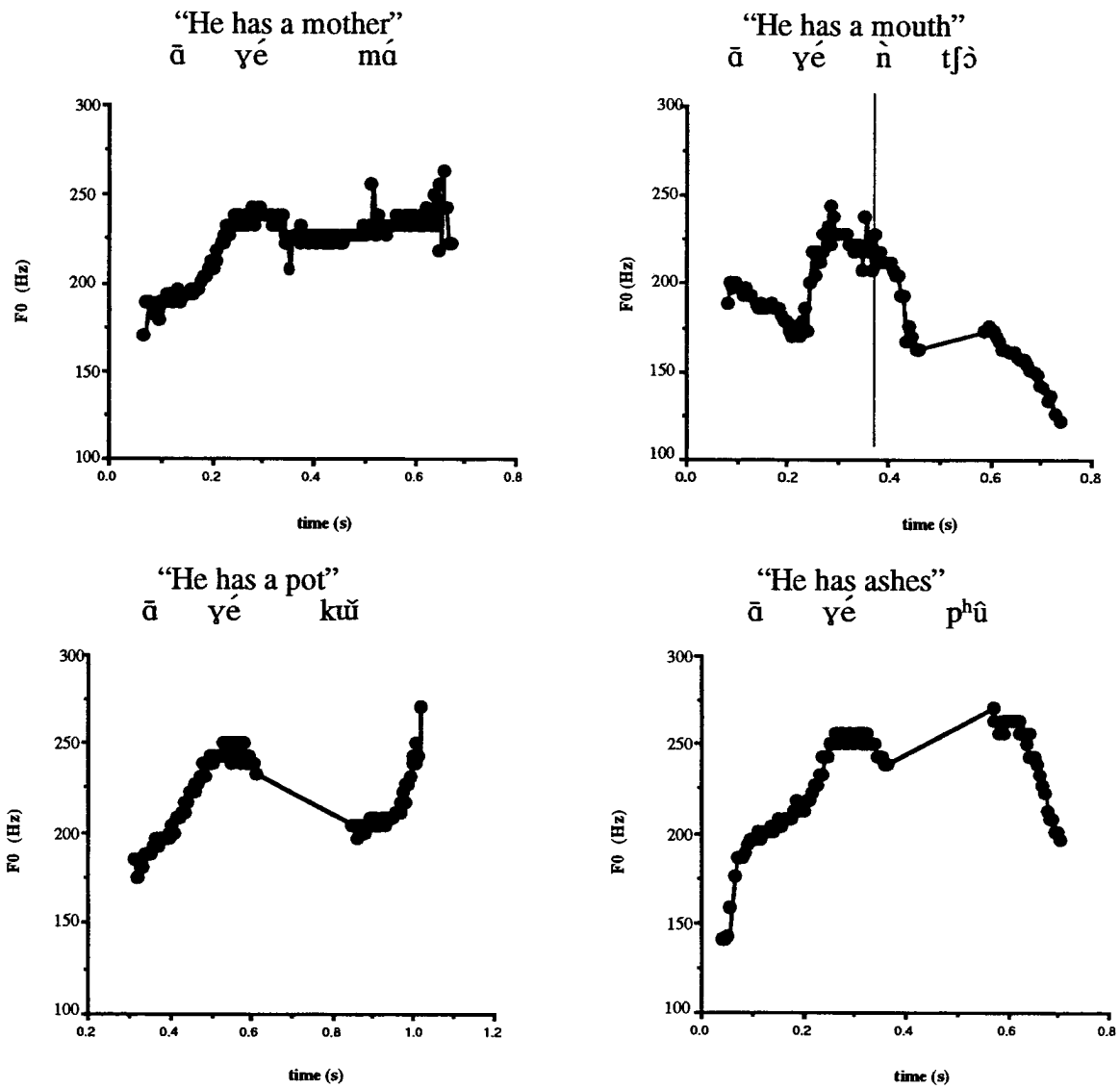

Figure 1. F_0 tracks of sample words from each tone pattern, in statements. Measured values, represented by dots, are connected by interpolation lines.

In the experiments below, the pitch track of the entire rhyme of the target word was recorded and smoothed using three point smoothing. A single measure for F0 in each word of the carrier phrase at the point of highest amplitude was also obtained using a simultaneously displayed energy plot. This procedure provides measurements relatively independent of the effects of adjacent consonants.

The duration of the rhyme of the target word was measured in both sentences from the onset to the end of vocalic voicing. The duration of the carrier phrase [ā ɣé] "he has" was also recorded as a control across the statement and question conditions. This measure was made from the onset of voicing up to but not including the onset consonant of the target word. Segmentation was done by waveform examination.

3. Results

3.1. Lengthening in Questions

In order to test the anecdotally observed final lengthening in questions, it was first necessary to determine that the speaker maintained the same carrier phrase rate in both conditions. The mean carrier phrase durations were 311.1ms for statements and 312.4ms for questions. A (two-tailed) paired t-test showed there to be no effect of statement vs. question on the rate at which the sentence was spoken, $t\ (42) = -.219$, $p = .8281$. A paired test was used in order to control for possible effects of the onset consonant of the target word on the preceding vowel of the carrier phrase.

There being no effect of statement vs. question on rate, the rhyme durations could be compared directly for each condition. A paired one-tail t-test showed there to be a significant main effect of statement vs. question on the duration of the final rhyme in the sentence, $t\ (42) = -156.767$, $p = .0001$. The difference between the mean final rhyme duration in statements and in questions is 156.8ms; questions being 72.7% longer than statements. This main effect is shown graphically in Figure 2.

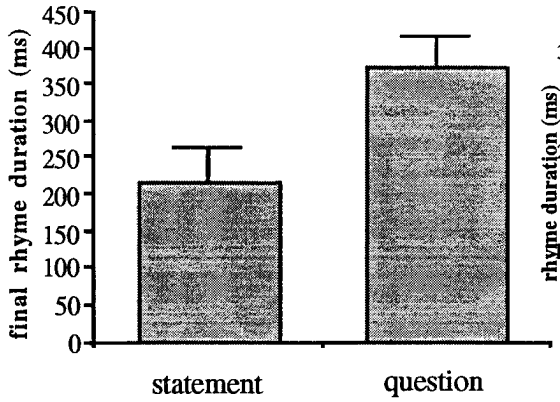

Figure 2. Duration of final rhymes in statements and questions. Standard deviation shown by error bars.

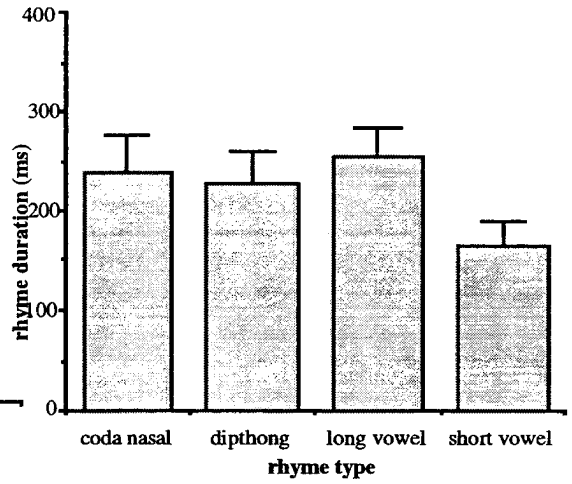

Figure 3. Final rhyme duration as a function of syllable type in statements. Standard deviation shown by error bars.

Next, we need to ask what effect, if any, the four rhyme types have on lengthening. In order to do this, we need first to find if rhyme types are significantly different from one another in rhyme duration in the *statement* condition. A one factor ANOVA showed there to be a significant effect of rhyme type on rhyme duration in statements, $F(3, 42) = 17.838$, $p = .0001$. Post-hoc pairwise comparisons using the Scheffe F-test showed there to be no significant difference at the 95% level in rhyme duration between the diphthong, closed syllable, and long vowel rhyme types. The CV type was significantly different at the 95% level from the other three rhyme types. The mean rhyme duration in statements for each rhyme type can be seen graphically in Figure 3.

These results suggest that the four rhyme types can be collapsed into just long and short categories. Subsequent analyses involving the categorical variable of rhyme type will be made using these categories. As expected, long versus short rhyme has a significant effect on rhyme duration in statements, $F(1, 42) = 48.81$, $p = .0001$. In the statements long rhymes have a mean duration of 240.7ms and short rhymes 164.8ms.

While all final rhymes are lengthened in a question as compared to a statement, there is a significant interaction of duration with rhyme type in questions as shown by a two-factor ANOVA, $F(1, 82) = 4.6113$, $p = .0347$. Short rhymes lengthen by 109.4%, and long rhymes by 59.2%. This lengthening is shown in Figure 4. Although short rhymes lengthen by a considerably larger percentage than long rhymes, the underlyingly long and short rhymes are still significantly different in length. It appears rather that the long rhymes are displaying a ceiling effect which prevents them from lengthening by the same amount as the short rhymes. A one-factor ANOVA shows a significant effect of rhyme

type on rhyme duration in questions, F(1, 42) = 7.544, p = .0089. Long rhymes exhibit a mean duration of 383.2ms (s.d. = 43.5) in questions, and short rhymes a mean duration of 345.1ms (s.d. = 37.2).

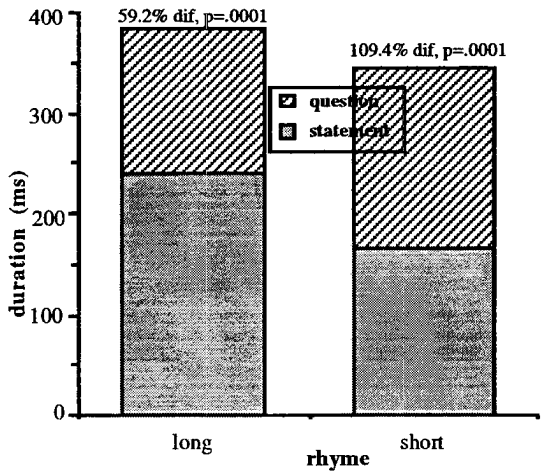

Figure 4. Final rhyme duration in statements and questions as a function of long vs short rhyme type. Shaded areas represent duration in statements; hatched area represents lengthening in questions.

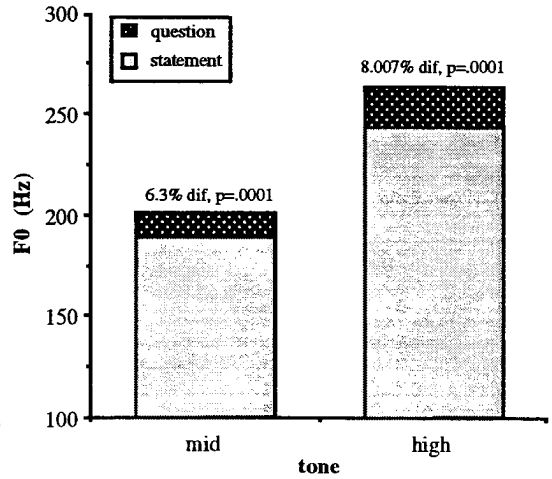

Figure 5. Pitch raising in statements and questions for the mid and high tones in the carrier phrase.

3.2. Pitch Range

Two F0 measures were made of the carrier phrase in both the statement and question condition: one of the mid tone on the first word and one of the high tone on the second. A one factor ANOVA shows there to be a significant effect of statement vs. question on the mid tone, F(1, 85) = 16.685, p = .0001. The questions have a significantly higher F0 for the mid tone in the carrier phrase than statements: 201Hz (s.d. = 18) vs. 189Hz (s.d. = 6). This is a difference of 6.3%. Likewise, the carrier phrase high tone is significantly higher in the questions than in the statements (F(1, 85) = 67.361, p = .0001). The question high has a mean F0 of 263Hz (s.d. = 13) and the statement a mean F0 of 243Hz (s.d. = 9); a difference of 8%. This question raising is shown graphically in Figure 5.

The H tone on target nouns occuring at the end of the phrase were raised by a like amount compared to the highs in the carrier phrase. The mean maximum F0 value for these words is 276Hz (s.d. = 9) in questions vs. 258Hz in statements (s.d. = 13), a difference of 7%. The overall mean F0 value for H target words (which also averages in tokens where optional final lowering took place as will be discussed below) was 261Hz (s.d. = 15) in questions vs. 246Hz (s.d. = 10) in statements; a difference of 6%. While there was no low tone word in the carrier phrase, the low tone target nouns were

examined to determine if low tones were realized differently in statements than in questions. Four measures were considered for all low tone target nouns—overall mean F0, minimum F0, endpoint F0, and maximum F0. One-factor ANOVAs showed that the statement vs. question condition had no effect on mean F0, minimum F0, and endpoint F0, $F(1, 19)$ $p = .3342$, $p = .94$, $p = .8357$ respectively. Maximum F0 was significantly higher in questions $F(1, 19)$, $p = .0107$, but this can probably be explained by the fact that the target noun was falling from a preceding high tone which was raised significantly in the questions. All of these pitch tracks show a downward fall from this preceding high. In summary, this experiment suggests that raising in the questions occurs over the entire clausal domain and affects highs more than mids, and lows not at all.

This raising of mids and highs in the question phrase, and of highs more than mids, suggests that pitch range expansion rather than upstep or overall register shift is at work here. Lows are not raised, and highs are raised by a greater percent than mids. Upstep generally refers to the raising of highs only, and an overall register shift or key raising would produce an equal raising of all lexical tones.

Before we can firmly assert that pitch range expansion is at work, we need to determine if for some reason the lexical low tones on the final target word are not undergoing raising whereas a low tone earlier in the sentence would be raised. There is evidence to suggest that the final pitch of a declarative phrase is less variable than other peaks in the phrase (Boyce & Menn 1979). This suggests that last syllables may be under-informative when examining F0 scaling. For this reason, a second experiment was conducted in which a low tone occured at the beginning of the carrier phrase.

In experiment two, the carrier phrase [ŋgɔ̀ ɣɛ́ ____]; "The stranger has ____ " or "Does the stranger have ____ ?" was used. The high and low tone nouns from Table 1 were used as the target words, yielding a total of 19 statements and 19 yes-no questions, 8 with high final nouns and 9 with low final nouns. The pitch of each word in the carrier phrase was tracked according to the methods outlined in section two. The pitch of the final noun was recorded at its endpoint.

Two-tailed paired t-tests were conducted to test a difference in pitch between statement and question for the low and high tones in the carrier phrase and for the lexical tone of the target word. The high tone of the carrier phrase is significantly higher in questions than in statements, $t\ (18) = -13.078$, $p = .0001$). The mean high tone is 205Hz (s.d. = 7) in the statements and 228Hz (s.d. = 7) in the questions. Importantly, the low tone in the carrier phrase also differs significantly between the two conditions, $t\ (18) = -13.459$, $p = .0001$), the mean low tone being 168Hz (s.d. = 3) in the declarative carrier phrase but

182Hz (s.d. = 4) in the question phrase.

The results show the lexical highs in the target words to be raised significantly in the questions, t (8) = -6.872, p = .0001, and the lows *not* to be significantly different, t (9) = 1.118, p = .2923. This result is in accordance with experiment one in which low toned target words were not raised in questions. However, the change in the low tone of the carrier phrase suggests that in general an overall higher pitch range is used in the yes-no questions than is used in the segmentally identical statements. However, lexical low tones occurring phrase finally appear not to undergo this raising.

3.3. Optional Final Lowering

Certain individual tokens of the LH and H, i.e. lexically high-final, target nouns in the questions have a final fall or a lowering throughout the rhyme which causes the F0 contour in the question rhyme to fall even with or below that of the statement. No statements ending in LH or H nouns showed this final lowering.

We have seen in experiment one that the endpoint, minimum, and overall mean for low target words does not differ between statement and question. However, the HL nouns do show a significant difference in both endpoint, F(1, 29) = 12.344, p = .0015, and in minimum, F(1, 29) = 12.824, p = .0013, as a function of statement vs. question with questions being significantly lower on both measures. It is unclear however whether this difference is due to final lowering operating in these questions or is merely a by-product of the question rhyme being longer in duration than the statement thereby allowing it more time to reach a lower target value in the fall from the initial H of the contour. Because these alternatives cannot be evaluated in this dataset, the discussion of final lowering in questions will focus on the LH and H nouns where final lowering in questions can be clearly distinguished due to the presence of a final lexical high.

The two patterns found in the LH case can be seen by comparing Figures 6 and 7. In pattern one, in Figure 6, the final H in the question condition ends higher than in the statements. In pattern two, in Figure 7, the entire contour in the question is lower than that of the parallel statement. This is counter to the general pattern of raising in questions. In pattern two, all the questions end lower than all the statements. Other tokens show fairly identical LH contours for the statements and questions.

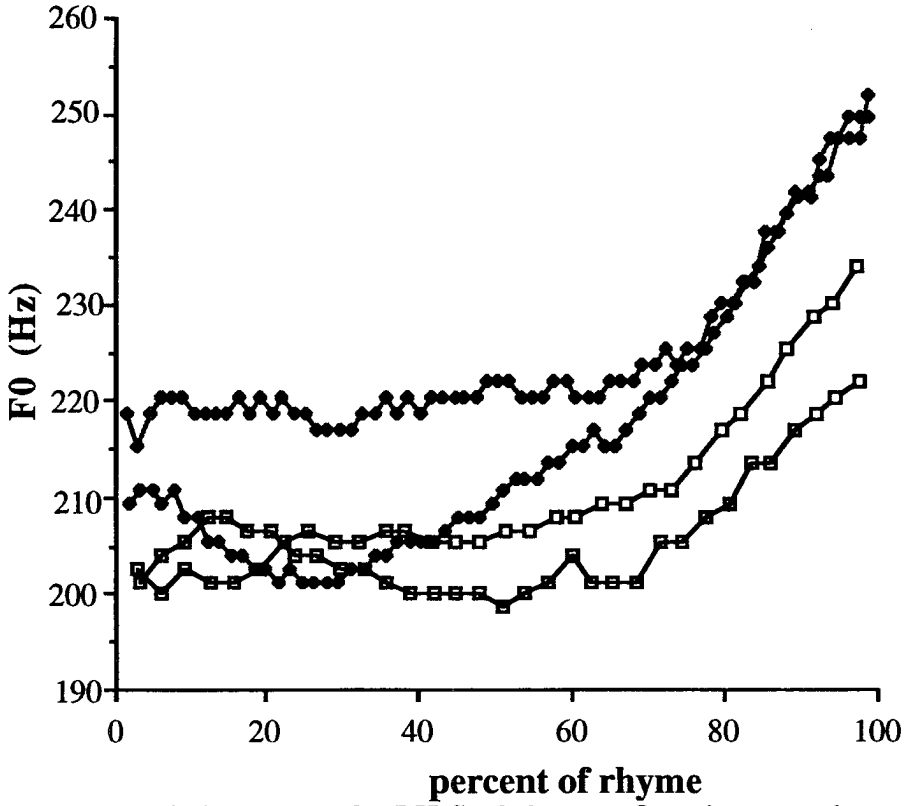

Figure 6 Pattern one pitch contours for LH final rhymes. Questions are shown by filled symbols, statements by open ones.

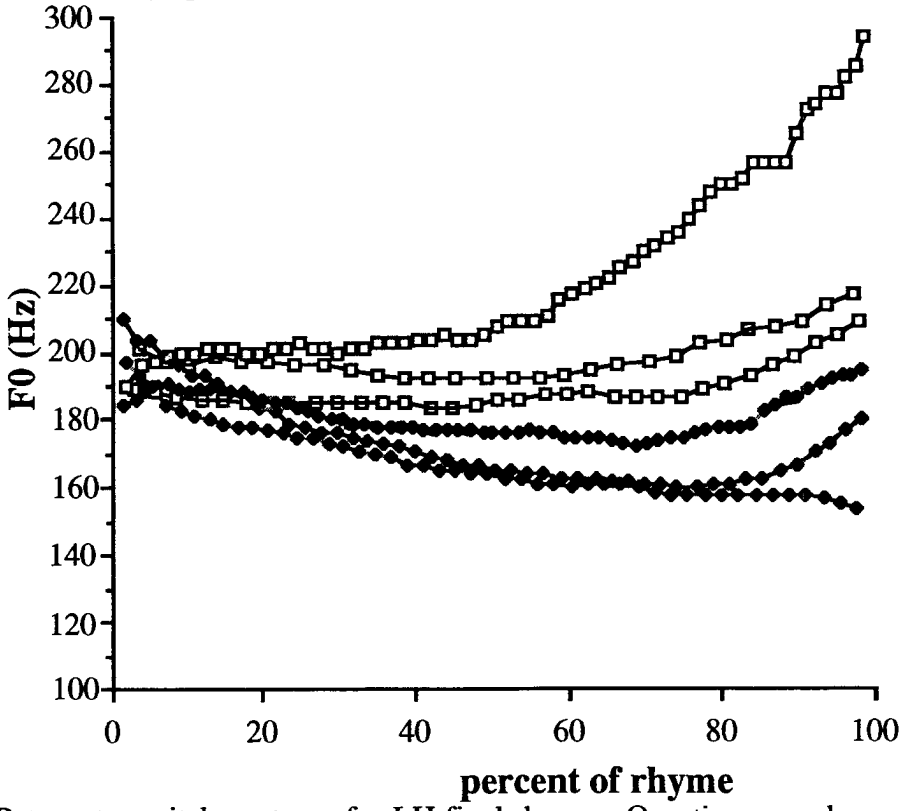

Figure 7. Pattern two pitch contours for LH final rhymes. Questions are shown by filled symbols, statements by open ones.

In the word [ŋdʒǐŋ] 'brother', the statement contour shows a LH pattern while the question contour shows a LHL pattern. This can be seen in Figure 8. The final fall in the question is aligned precisely to occur where the final high ends in the statement. This suggests that a final L is optionally added along with the extra length in the question. If not added, the endpoint of a phrase final lexical LH in a question is raised above that of the statement level as is expected due to the higher pitch range used in questions. If the final L is added, it may act to lower the entire preceding contour, or it may simply cause a final lowering, ie. a fall, after the predictably raised contour.

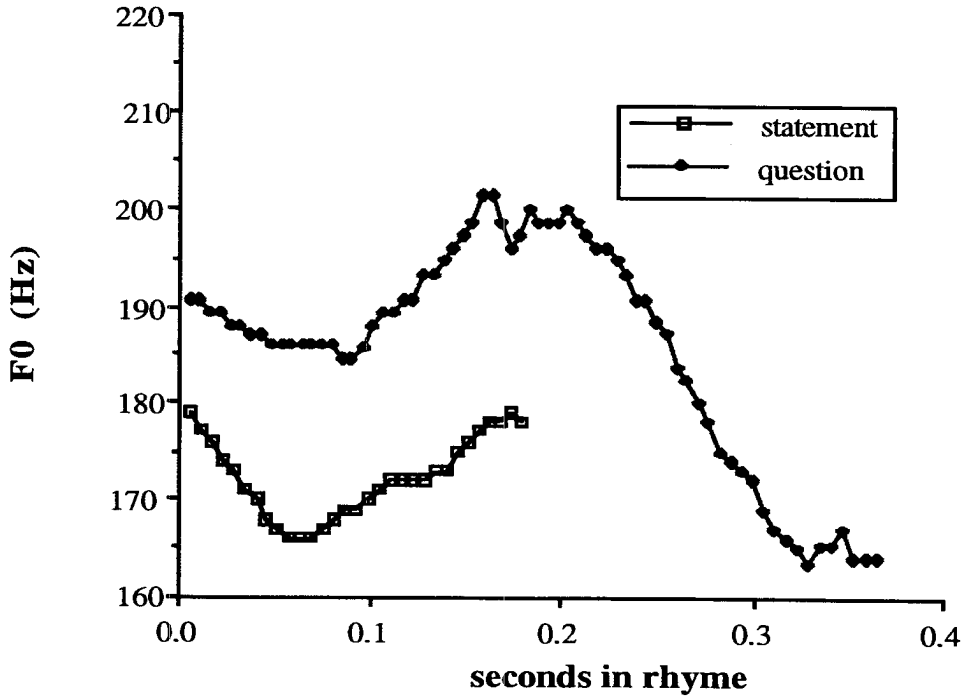

Figure 8. Pitch contours for the word [ŋdʒǐŋ] 'brother'. Questions are shown by filled symbols, statements by open symbols.

It can be shown that the addition of the final low is optional by comparing the pronunciations of [fùɔ́], recorded as both 'leaf' and 'medicine'. The token for 'medicine' showed no final lowering while the token for 'leaf' showed a pattern two output. These two English words are translated by the same word in Nchufie; identical segmentally, tonally, and in noun class. However, this word was elicited twice, once using each English meaning, yet the word conformed to different patterns for each elicitation. Likewise, 'brother' and 'brothers' which differ in only the onset consonant showed final lowering in the case of 'brother' and no final lowering in the case of 'brothers'. This suggests that the addition of the final low in questions is optional and not determined by segmental, tonal, or class qualities of the noun. The appearance of final lowering was

also not predictable from the token's location in the recording list.

High final nouns show a similar duality in patterning. In pattern one, as seen in Figure 9, each statement/question pair shows the question condition to have a higher pitch contour throughout the final rhyme than that found in the statement. Figure 10 shows the second pattern where the normally raised high of the question falls to the same level as the statement, or the end of the rhyme falls below its level in the statement. In experiment two, one of the 8 high target words, [tʰɯ́] 'tree' showed no raising in the questions, ending in the same pitch as in the statement condition. This word did undergo raising in experiment one, again suggesting an irregular process.

To determine if speaking rate (i.e. carrier phrase duration) or rhyme duration were correlated with the appearance of the optional final low, the pattern one and two groups for the H and LH nouns were recoded as integer values and correlations of these categories with carrier phrase duration and rhyme duration were calculated. Neither rate nor rhyme duration were correlated with the appearance of a final low ($R^2 = .0001$ and $R^2 = .022$ respectively).

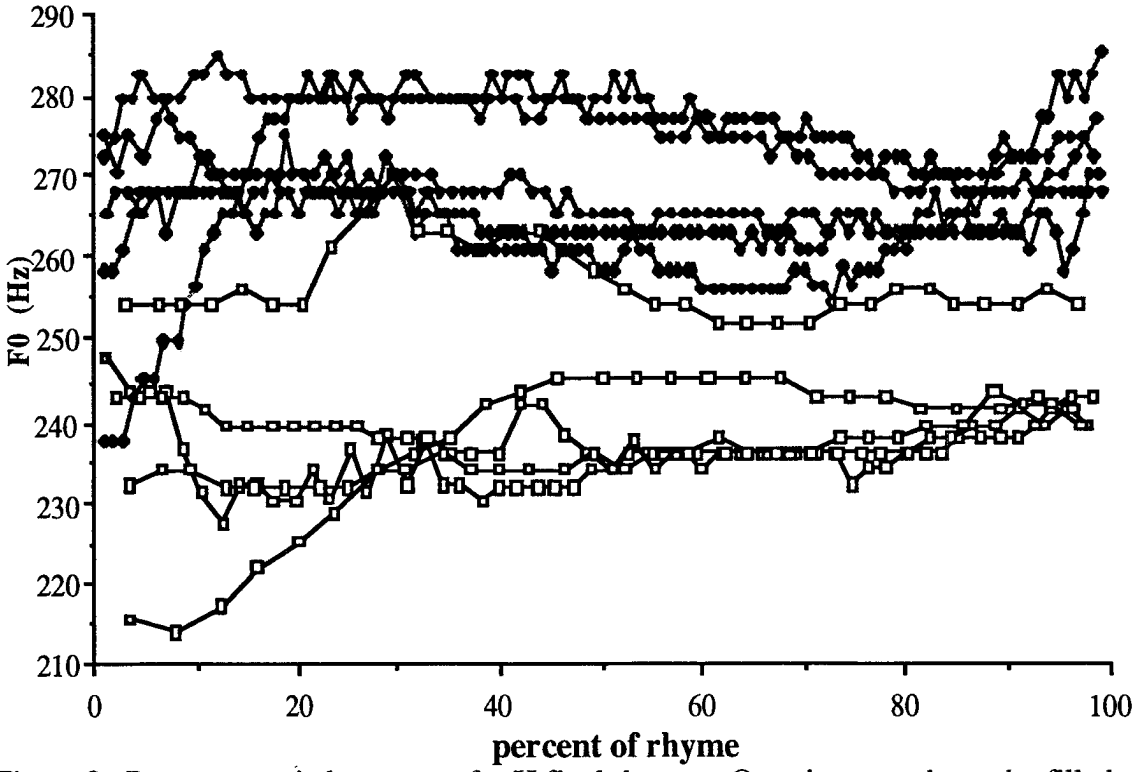

Figure 9. Pattern one pitch contours for H final rhymes. Questions are shown by filled symbols, statements by open symbols.

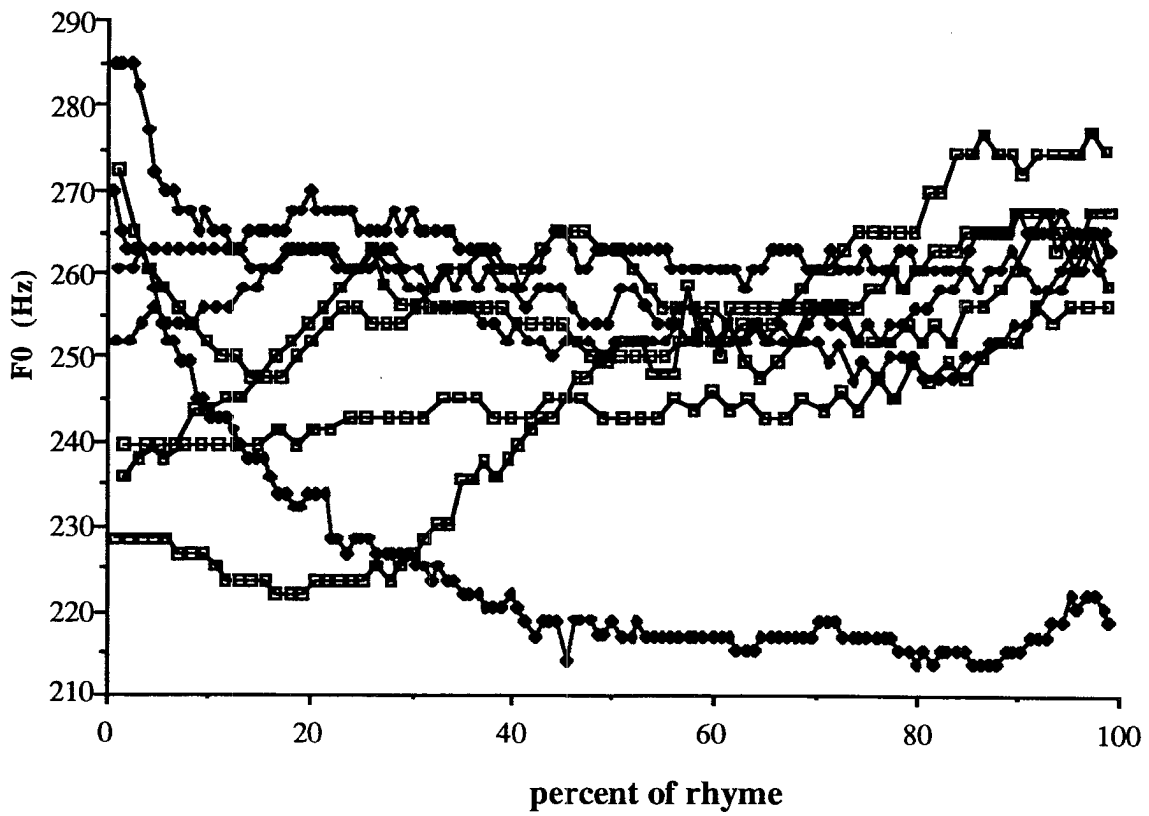

Figure 10. Pattern two pitch contours for H final rhymes. Questions are shown by filled symbols, statements by open symbols.

3.4. Summary of Results

In summary, it has been shown that yes-no questions in Nchufie are marked by several cues. First, question prosody is characterized by a specific duration cue. The final rhyme of the phrase is lengthened substantially, more than doubled in the case of CV syllables. The amount of lengthening is dependent on whether the rhyme is underlyingly long or short, with long rhymes showing a ceiling effect causing them to lengthen by 59% as compared to 109% for short rhymes. Secondly, a higher pitch range is used in questions, causing high, mid, and low tones to be raised in the phrasal domain but not affecting phrase-final lexical low tones. Finally, we have seen that the lengthening of the final rhyme in yes-no questions may optionally be accompanied by a final lowering. If present, this low tone may have the effect of lowering the entire contour of the final rhyme or adding a final fall in F0 at the end of the rhyme. Whether this low tone appears or not is not predictable in this dataset from the melodic, tonal, or morphological nature of the word nor from the rate of speaking or length of the rhyme.

4. Discussion

The facts of Nchufie yes-no question formation appear to set it apart from most other languages, including others, such as Hausa, that form yes-no questions solely by prosodic means. First, there are no *non-local* durational differences between Nchufie questions and statements. Lindau (1986) found that in Hausa questions were an *overall* 10% *shorter* than statements. Lindau notes that consideration of durational differences in questions and statements is not part of the general literature on the topic of question formation; however, Bannert's (1983) study of German found no significant differences in the duration of statements and questions. *Final* lengthening in questions may be more common in West African languages. Dagbani combines lengthening with a final lowering (Hyman, to appear), and Gokana has an utterance final glottal stop in the declarative which is lost in the corresponding negative, leaving a somewhat longer vowel (Hyman 1985a). Ngangoum (1970) describes different question particles in Bamileke-Fe'fe' which, with or without segmental and/or tonal content, may result in lengthening of the final vowel.

Second, local lengthening in questions appears to affect both final short and long vowels in Nchufie. In contrast, Newman and Newman (1981) have claimed that in Hausa questions lengthening takes place on final short syllables only.

Third, a higher register is used in Nchufie questions. While an overall higher register is not the most common type of yes-no question intonation, 34% of Ultan's (1978) sampled languages used some form of raised pitch other than a final rise. Some of the languages using this type of yes-no question intonation include Swedish (Hadding-Koch 1961, Gårding 1979, Bredvad-Jensen 1980), Mandarin (Shen 1990), and Sango (Samarin 1967). Hausa has been shown to have a locally raised final high tone in yes-no questions (Hoffman & Schachter 1969, Kraft & Kraft 1973, Cowan & Schuh 1976, Miller & Tench 1980, Lindau 1986). Newman and Newman (1981) have used the term 'key raising' to refer to the systematic upward shift of final H and L tones which occurs in questions in Hausa (also Hodge & Umaru 1963). Hoffman and Schachter (1969), Newman and Newman (1981), Schuh (1978), Lindau (1986), and Inkelas and Leben (1990) have claimed that downdrift is suspended in Hausa questions. Inkelas and Leben (1990) suggested that the reason for this is that downdrift is incompatible with key raising. They analyze key raising as the attachment of a H tone to the register tone tier, which raises the tone attached to the primary tone tier. Since downdrift is the insertion of a register low tone, the incompatibility is predicted. Lindau's (1986) showed that Hausa yes-no questions are not marked by a raised register but by the global suspension of the

statement downward slope in favor of zero slope, and a local feature of a considerably raised F0 for the last high tone. The slopes of the F0 grids for the statement and question pivot around the same starting F0. The width (range) of the grid is no different in statements and questions, and the grid is in no sense raised for questions. However, for the Nchufie data presented here, a zero slope F0 contour, i.e. the suspension of downdrift, cannot entirely explain the higher F0 in questions in Nchufie, as the *starting* fundamental frequency in question and statement phrases is significantly different.

A comparison of raised question highs with the syntactic superhigh which marks the past tense in Nchufie has not been undertaken. Work on Hausa by Inkelas and Leben (1990) and Hyman (1985b, 1986) suggest that the raised highs in Nchufie questions might be represented by a phonological structure linking a high register tone and a high primary tone. As this system of representation offers no obvious way of distinguishing the syntactic superhigh from the raised intonational high, it is important whether or not these tones are empirically different. This representation for Nchufie would additionally predict that superhighs in a yes-no question would not undergo any raising and that downdrift would not occur within the the intonational phrase of the question.

Fourth, an optional final low tone was found to occur in Nchufie questions. Newman and Newman (1981) suggested that the final raised high in Hausa questions may optionally be followed by a low tone question morpheme which includes length. The addition of this final low tone neutralizes the distinction between H and HL lexical tones in final position (Inkelas & Leben 1990). Kraft and Kraft (1973) similarly report that a final high becomes falling in a Hausa yes-no question. This observation is similar to some of the Nchufie data described above. Lindau (1986) found, however, that the final fall observed by Newman and Newman (1981) in Hausa yes-no questions is actually an optional rule of ending low which is not specific to questions but also occurs in statements. In her data, the same speakers who fell finally in questions also fell in statements. She claims therefore that the optional low is not part of the question morpheme. In the data presented here, the optional low tone seen in questions was *never* seen in statements, suggesting that this is a process which is part of yes-no question formation in Nchufie, not a general characteristic of the language or this speaker. One would like to find some explanation for the irregular appearance of the optional final low tone in these questions. It has been suggested that a difference in meaning could affect which type of question formation is used (Hayes, personal communication). The connotation signaled by this low tone would have to be one that doesn't occur in statements, as we never saw the final lowering in statements. The optional final low tone

may also be a survival from an interrogative particle such as that occurring in Bamileke-Fe'fe', another Grassfields language. Ngangoum (1970) describes two question particles in this language, [í] which can assimilate to a preceding vowel resulting in lengthening and [à]. He also notes that final vowels may simply be lengthened, even in CVC syllables.

Speculation as to how the yes-no question intonation of Nchufie can be represented phonologically is presented below as a means of introducing some of the relevant representational questions raised by this data. The possibilities described are not intended to be exhaustive, but rather, thought-provoking. The representation of key raising and downstep outlined by Inkelas and Leben (1990) and Hyman (1985b, 1986) provides for a Primary Tone Tier and a Register Tone Tier. These are linked to the syllables via an intermediate Tonal Node Tier. This structure is shown below.

```
                    σ
                    |
                    o        Tonal Node Tier
                   / \
Primary Tone Tier  T   T    Register Tone Tier
```

(after Inkelas and Leben, 1990)

A high Register Tone will raise a Primary Tone and a low Register Tone will lower or downstep a Primary tone. I will assume for the sake of this discussion that a Tonal Node may be attached to only one Primary Tone and that falling and rising contours are created by adjacent Tonal Nodes which differ in their Primary Tone specification. This implies by extension that a syllable may be attached to more than one Tonal Node.

In considering the Nchufie yes-no questions, a H register tone could be added to all tonal nodes within the relevant intonational phrase. This will be realized as a globally higher pitch during phonetic implementation. The final lengthening could be represented as the addition of a mora to the final rhyme of the phrase. The phonetic implementation of this additional mora will result in final lengthening. Note that this level of the phonology couldn't have restrictions on the number of moras in a syllable. The straightforward interpretation of this procedure however makes the prediction that a short vowel which gets another mora should be realized with the same length as a long (two mora) vowel in the declarative condition. However, this was found not to be the case.

One resolution would be to allow phonetic implementation to have access to the source of the length/weight. Finally, recall that in questions the optional final low sometimes produces an abrupt final fall and sometimes has the effect of lowering the final H Primary Tone, neutralizing the pitch range expansion in that rhyme. The final abrupt fall could be represented as the case in which a low tone attaches as a *Primary* Tone dependent on the rightmost Tonal Node of the phrase. This leaves open the question of whether it attaches to a tonal node created by lengthening or whether it projects its own tonal node. The lowering of the final Primary high tone could be captured in a representation in which the low tone attaches as a *Register* Tone dependent on the rightmost Tonal Node of the phrase. In the process, it would displace the high register tone otherwise present in question intonation. Crucially, this approach does not explain why final lexical low tones do not undergo raising. The description outlined above is only one of several ways in which the prosodic aspects of Nchufie yes-no questions could be represented. It is offered not as a definitive approach but rather as a means of suggesting some of the relevant representational questions engendered by this and other similar data.

5. Conclusion

The results described above extend our typology of prosodic marking in questions. This research is an instrumental study of the use of duration and intonation in question formation. Being a tonal language, Nchufie provided the opportunity to explore the interaction of lexical and intonational F0 specification. Both duration and pitch behave unusually in Nchufie questions with respect to patterns familiar from the rest of the world's languages. Substantial lengthening was found to occur in questions, and the intonational patterns employed in questions, i.e. overall raising and optional final lowering, are types rarely attested in other literature.

Acknowledgment

Work on Nchufie has recently begun in the Department of Linguistics at UCLA. The author wishes to thank Sophie Ajeakwa for extensive work as a language consultant, Hilda Koopman for leading the research on Nchufie at UCLA, and Ian Maddieson, Keith Johnson, Mary Beckman and an anonymous reviewer for insightful comments on this study. This work was supported a National Science Foundation Graduate Fellowship and the UCLA Department of Linguistics.

REFERENCES

Bannert, R. (1983). Some phonetic characteristics of a model for German prosody. *Working Papers* (Department of Linguistics, University of Lund) **25**, 1-34.

Boyce, S. and Menn, L. (1979). Peaks vary, endpoints don't: Implications for intonation theory. In Chiarello, et al., (editors) *Proccedings of the Fifth Annual Meeting of the Berkeley Linguistic Society*, pp. 373-384.

Bredvad-Jensen, A.-C. (1983). An intonation-oriented description of questions in Swedish. In Hovdhaugen, E. (editor) *The Nordic Languages and Modern Linguistics*, 233-241. Oslo: Universitetsforlaget.

Cowan, R. and Schuh, R. (1976). *Spoken Hausa*. Ithaca, NY: Spoken Languages Services, Inc.

Gårding, E. (1979). Sentence intonation in Swedish. *Phonetica* **36**, 207-215.

Grimes, B. (editor) (1988). *Ethnologue: Languages of the World, 11th edition*. Dallas: Summer Institute of Linguistics.

Hadding-Koch, K. (1961). *Acoustico-Phonetic Studies in the Intonation of Southern Swedish*. Lund: Gleerups.

Hodge, C. and Umaru, I. (1963). *Hausa Basic Course*. Washington D.C.: Foreign Service Institute,

Hoffman, C. and Schachter, P. (1969). Hausa. In E. Dunstan (editor) *Twelve Nigerian Languages*. London: Longmans.

Hyman, L. M. (1985a). *A Theory of Phonological Weight*. Dordrecht: Foris.

Hyman, L. M. (198b). Word domains and downstep in Bamileke-Dschang. *Phonology Yearbook*, 2, 47-83.

Hyman, L. M. (1986). The representation of multiple tone heights. In K. Bogers, H. van der Hulst and M. Mous (editors). *The Phonological Representation of Suprasegmentals*, 109-152. Dordrecht: Foris.

Hyman, L. M. (to appear). Structure preservation and postlexical phonology in Dagbani. In E. Kaisse and S. Hargus (editors), *Lexical Phonology*. Orlando: Academic Press.

Inkelas, S. and Leben, W. (1990). Where phonology and phonetics intersect: the case of Hausa intonation. In Beckman M. and Kingston J. (editors). *Papers in Laboratory Phonology: Between the Grammar and Physics of Speech*, 17-34. Cambridge: Cambridge University Press.

Kraft, C. and Kraft, M. (1973). *Introductory Hausa*. Berkeley and Los Angeles: University of California Press.

Lindau, M. (1986). Testing a model of intonation in a tone language. *Journal of the Acoustical Society of America* **80**, 757-764,

Miller, J. and Tench, P. (1980). Aspects of Hausa intonation: Utterances in isolation. *Journal of the International Phonetic Association* **10**, 45-63.

Newman, P. and Newman, R. (1981). The q morpheme in Hausa. *Afrika und Übersee* **64**, 35-46.

Ngangoum, P. F. (1970). *Le bamileke des Fe'efe'e*. Privately published, available from Nufi, B.P. 13, Bafang, Cameroun.

Samarin, W. (1966). *A Grammar of Sango*. (Janua Linguarum, series practica 38). Mouton: The Hague.

Schuh, R. (1978). Tone rules. In Fromkin, V. A. (editor), *Tone: A Linguistic Survey*, 221-256. New York: Academic Press.

Shen, X. S. (1990). *The Prosody of Mandarin Chinese*. Berkeley: University of California Press.

Shen, X. S. (1991). Question intonation in natural speech: a study of Changsha Chinese. *Journal of the International Phonetic Association* **21**, 19-28.

Ultan, R. (1978). Some general characteristics of interrogative systems. In Greenberg, J. H., Ferguson, C. A., and Moravcsik, E. A. (editors), *Universals of Human Language, Vol. 4: Syntax*, 211-48. Stanford: Stanford University Press.

ON OPTIONAL AND OBLIGATORY PRENASALIZATION IN NCHUFIE REDUPLICATION*

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0. Introduction

In this paper I analyze a productive process of total segmental reduplication affecting Nchufie adjectives. We will see that an optional process of prenasalization which conditionally applies under reduplication is blocked when the stem begins with a voiceless fricative. However, in other morphological environments, prenasalization is obligatory regardless of the quality of the stem-initial consonant. We will attempt to motivate this patterning in the context of Structure Preservation (Kiparsky 1982, 1985), and Harmonic Phonology (Goldsmith 1991, Prince and Smolensky 1992, McCarthy and Prince 1992).

In Section 1 I present the preliminaries: the consonant inventory, and relevant lexical segmental processes. In Section 2 I present the process of total adjectival reduplication, as well as a morphologically-triggered phenomenon of optional prenasalization which conditionally affects the process. I consider the systematic gap in prenasalization: voiceless fricative-initial stems do not undergo the process. I will additionally discuss an instance of obligatory, across-the-board prenasalization. In Section 3, two approaches to Structure Preservation are discussed in an attempt to account for the patterning of both optional and obligatory prenasalization. I ultimately embrace elements of both. Finally, in Section 4, I consider the data in the context of Harmonic Phonology.

1. Preliminaries

1.1. Consonant Inventory

In (1) is the underlying consonant inventory of Nchufie.

* I would like to thank Dorit Ben Shalom, Dani Byrd, Jong Whan Chang, Jong Ho Jun, Karn King, Hilda Koopman, and Murat Kural for their help and advise. I would especially like to thank Sophie Ajeakwa, our Nchufie consultant.

(1)

p	t	c		
p^h	t^h		k^h	
f	s			
(v)	z		ɣ	
m	n		ŋ	
	l			
		y	w	N

The status of /v/ is questionable, as it has been found in only one form. /c/ is the voiceless palato-alveolar affricate. /N/ is the nasal glide. As /k/ is missing from the inventory, we might interpret [ɣ] as underlying /k/.

1.2. Relevant Segmental Processes

The relevant segmental phonology involves derived prenasalization, in which the concatenation of morphemes may bring together a nasal and another segment. Both voiced and voiceless prenasalized plosives are attested, both in underived and derived environments. However, prenasalized fricatives are not attested in underived environments, though they may be derived under certain circumstances (to be discussed in section 3). In (2) is a sampling of underived prenasalized forms, indicating that voiceless as well as voiced plosives may follow nasals.

(2)	a.	$ŋk^hu$	(back (body part))
	b.	ŋgəuɥ	(go)
	c.	ndugɔ	(glass)
	d.	ɲjo:	(steal)
	e.	ŋgwaɛ	(book)

Following Herbert (1986) and Jun (to appear), I assume prenasalized plosives are underlying sequences. Nasals which are not underlyingly prevocalic acquire the place node of the following segment, and thus we may assume that these underlying nasals are the placeless glide (see Trigo 1988).

(3)

```
NP          NP
 |     →    \|
[place]     [place]
```

(where N = nasal, P = plosive)

Important for the present investigation is the process of post-nasal hardening, in which the second member of a derived nasal-consonant sequence hardens to a plosive. This occurs among the glides, the liquid, and the voiced fricatives. In (4) are examples of

post-nasal hardening.

(4)	ɣə^{HL}	(cold)	-	ŋgə^{L}	(was cold)
	zɔng^{HL}	(dry)	-	njɔng^{L}	(was dry)
	lyɛ^{HL}	(clean)	-	ndyɛ^{L}	(was clean)
	wu:^{HL}	(short)	-	ngu:^{L}	(was short)
	yiɛ^{HL}	(say)	-	njiɛ^{L}	(said)

Note that when /z/ undergoes the process, it palatalizes as well, presumably so that Structure Preservation is maintained (Kiparsky 1982, 1985): the segment inventory possesses the post-alveolar affricate, while lacking its alveolar counterpart. Indeed, the structure preserving nature of this segmental process will be shown to play a crucial role in our discussion of reduplication vis-a-vis prenasalization.

As already noted, we may assume that nasals acquire place features from the following consonant. Upon the acquisition of place features, the nasals harden to stops. Now, the nasals' stricture features spread to the following consonant. If further modifications are required in order to preserve structure, these now apply. Thus laterality is lost from prenasalized /l/, and the derived alveolar affricate becomes post-alveolar. The patterns in (5) emerge.

(5)		underlying	assimilation	hardening	S.P.
	ɣ:	Nɣ	ŋɣ	ŋg	ŋg
	z:	Nz	nz	ndz	nj
	l:	Nl	nl	ndl	nd
	w:	Nw	ŋw	ŋgw	ŋgw
	y:	Ny	ny	ndy	ndy

See Jun (to appear) for a fully formalized account of these processes.

2. Adjectives and Adjectival Reduplication

In this section I present the process of total adjectival reduplication, as well a syntactically-triggered process of optional prenasalization which conditionally affects the process. We will consider a systematic gap in this optional process, as well as a distinct process of across-the-board prenasalization.

2.1. Tone Classes

The tonal patterning of Nchufie adjectives falls into two classes. On the surface, adjectives possess either a High-Low tonal pattern (Class A), or a Low-High-Low tonal pattern (Class B). Examples follow.

(6)	Class A (HL)		Class B (LHL)	
	ʃyɛ^{HL}	(split)	ʃyɛ^{LHL}	(tall)
	wu:^{HL}	(short)	wu:^{LHL}	(amazing)
	pɯgɯ^{HL} ([pɯ^{H}gɯ^{L}])	(red)	pɔgo^{LHL} ([pɔ^{L}go^{HL}])	(good)

The minimal and near-minimal pairs in (6) confirm the existence of an underlying tonal contrast.

2.2. Adjectival Reduplication

Adjectival reduplication occurs in adjectives which modify predicate nominals:

(7)	a.	a^{L} k^{h}a:^{HL}	(it is small)
		a^{H} yɛ^{L} k^{h}a:^{HL} k^{h}a:^{HL}	(it is a small one)
	b.	a^{L} fu^{HL}	(it is white)
		a^{H} yɛ^{L} fu^{HL} fu^{HL}	(it is a white one)
	c.	a^{L} ɣə^{HL}	(it is cold)
		a^{H} yɛ^{L} ɣə^{HL} ɣə^{HL}	(it is a cold one)
		a^{L} zɔng^{HL}	(it is dry)
		a^{H} yɛ^{L} zɔng^{HL} zɔng^{HL}	(it is a clean one)
	d.	pii^{LH}ncu^{M} lyɛ^{HL}	(Pinchu is clean)
		pii^{LH}ncu^{M} mɛ^{HL} lyɛ^{HL} lyɛ^{HL}	(Pinchu is a clean child)
	e.	a^{L} wu:^{HL}	(it's short)
		a^{H} ŋɔ^{L} wu:^{HL} wu:^{HL}	(he's a short man)

I have arranged the data so that the initial segment of the adjective increases in sonority as the list progresses, thus providing tokens of each distinct manner type, if attested. In (a) we see voiceless stop-initial adjectives undergoing the process. In (b) we see voiceless fricatives. In (c) we see the voiced velar fricative, as well as the voiced coronal fricative. (d) shows a liquid-initial adjective, and (e) shows a glide-initial adjective. There thus far seems nothing peculiar about the process: any adjective of any segmental shape appears to be able to reduplicate freely, suggesting the input undergoes an ordinary process of full reduplication.

2.3. Optional Prenasalization

The reduplication picture becomes somewhat more complex when considering overtly tensed constructions. The Past and Future morphemes consist of nasality lexically associated with tonal material: High for Future ('^{H}'), SuperHigh for Past ('^{sH}'). These

morphemes prefix to verbal stems. We thus observe the patterns in (8).

(8) a. a^{L} tung^{HL} (he kicks)
a:^{LH}ntung^{M} (he will kick)
a:^{LsH}ntung^{L} (he kicked)

b. a^{L} k^{h}a:^{HL} (he runs)
a:^{LH}ŋk^{h}a:^{M} (he will run)
a:^{LsH}ŋk^{h}a:^{L} (he ran)

Now observe how tense marking affects of reduplication.

(9) a. a:^{L} - ^{sH} m - bə^{L} - yɛ^{L} - ŋgə$^{H\,L}$ - ŋgə^{HL} (it was a cold one)
it - tense - copula - one - N-cold - N-cold
a:^{LsH}mbə^{L} yɛ^{L} ɣə^{HL}ɣə^{HL} (it was a cold one)

b. a:^{LsH}mbə^{L} yɛ^{L} ŋk^{h}a:^{HL} ŋk^{h}a:^{HL} (it was a small one)
a:^{LsH}mbə^{L} yɛ^{L} k^{h}a:^{HL} k^{h}a:^{HL} (it was a small one)

c. a:^{LsH}mbə^{L} yɛ^{L} ndyɛ^{HL} ndyɛ^{HL} (it was a clean one)
a:^{LsH}mbə^{L} yɛ^{L} lyɛ^{HL} lyɛ^{HL} (it was a clean one)

d. a:^{LM}mbə^{M} yɛ^{L} mbɔ^{L}go^{L} mbɔ^{L}go^{HL} (it will be a good one)
a:^{LH}mbə^{M} yɛ^{L} pɔ^{L}go^{L} pɔ^{L}go^{HL} (it will be a good one)

e. a:^{LsH}mbə^{L} yɛ^{L} njong^{HL} njong^{HL} (it was a dry one)
a:^{LsH}mbə^{L} yɛ^{L} zong^{HL} zong^{HL} (it was a dry one)

Nasality optionally -- though preferably -- appears on both copies of the adjective.

2.4. The Exception

Despite nasality's optional though preferred appearance on predicate nominal-modifying adjectives in overtly tensed constructions, there is a systematic exception in the data, exemplified in (10).

(10) a. a:^{LsH}mbə^{L} yɛ^{L} ʃɯ^{L} ʃɯ^{HL} (it was a tall one)
*a:^{LsH}mbə^{L} yɛ^{L} nʃɯ^{L} nʃɯ^{HL}

b. a:^{LsH}mbə^{L} yɛ^{L} ʃyɛ^{HL} ʃyɛ^{HL} (it was a split one)
*a:^{LsH}mbə^{L} yɛ^{L} nʃyɛ^{HL} nʃyɛ^{HL}

c. a:^{LsH}mbə^{L} yɛ^{L} fuo^{HL} fuo^{H} (it was a bright one)
*a:^{LsH}mbə^{L} yɛ^{L} mfuo^{HL} mfuo^{HL}

d. a:^{LsH}mbə^{L} yɛ^{L} fu^{HL} fu^{HL} (it was a white one)
*a:^{LsH}mbə^{L} yɛ^{L} mfu^{HL} mfu^{HL}

Otherwise optional prenasalization is disallowed in all instances of voiceless fricative-initial adjectives.

2.5. Obligatory Prenasalization

Note that in the following forms voiceless fricative-initial adjectives and verbs regularly *do* take prenasalization when its presence is obligatory.

(11) a. a:^{LsH}n ʃyɛ^{L} (it was split) (*a^{LsH}ʃyɛ^{L})
| V |
it Past split

b. a:^{LsH}nʃyɛ^{L} (it was tall) (*a^{LsH}ʃyɛ^{L})
c. a:^{LsH}mfuo^{L} (it was bright) (*a^{LsH}fuo^{L})
d. a:^{LsH}mfu^{L} (it was white) (*a^{LsH}fu^{L})

These data indicate that the prenasalization of voiceless fricatives is *not* disallowed categorically. It seems that in morphological operations which are required either by the grammar, or by a recoverability requirement, as in tense marking in predicate adjective constructions, prenasalization may indeed result in a non-structure-preserving output.

3. Approaches to Structure Preservation

In this section I attempt to explain the asymmetry between optional prenasalization and obligatory prenasalization by invoking Structure Preservation in the context of Lexical Phonology (Kiparsky 1982, 1985).

Lexical rules are claimed to be structure preserving, in that their application may not produce new segments, or, under certain analyses, new sequences of segments (Borowski 1986). Thus throughout the lexical phonology, the output of rules may only result in segments and sequences present in the underlying inventory. Structure Preservation does not hold in the post-lexical phonology, however. Post-lexical rules may create novel segments, i.e., segments not found in the underlying inventory, and non-underlying sequences of segments.

There are, however, different possible ways to invoke Structure Preservation. The first approach to the process we will discuss might be termed Static Structure Preservation, as the principle holds blindly within the lexical phonology: any lexical process that produces a non-structure-preserving output is blocked from applying,

presumably through feature co-occurence constraints, or, as in the case at hand, phonotactic constraints. These are traditionally referred to as *constraints* or *filters* (Clements and Keyser 1983, Borowsky 1986, Myers 1991).

The second approach to Structure Preservation we might call Active Structure Preservation, as the principle may itself be the trigger of particular phonological rules. Specifically, Active Structure Preservation may not have the power of preventing rules from applying when their output is non-structure-preserving. However, the principle may re-impose Structure Preservation on such an output by triggering further phonological processes. Myers (1991) refers to such processes as *persistent rules*.

Having presented these two approaches to Structure Preservation, let us recall the prenasalization facts from Nchufie. First, recall the morpheme-internal segment sequencing constraints of Nchufie presented in Section 1. While nasals may precede any plosive, they may not precede fricatives. Now recall the prenasalization facts from adjectival reduplication: nasality optionally though preferably appears on both copies of object modifying adjectives in the Past and Future. Voiced fricative-initial adjectives harden upon prenasalization, while voiceless fricative-initial adjectives may not be prenasalized.

Let us now consider the two approaches to Structure Preservation, and see if either can account for the facts.

Static Structure Preservation forbids lexical rules from applying if their output violates Structure Preservation. This approach will obviously fail to account for the data, as the process of optional prenasalization -- more often than not -- obviously results in an intermediate violation of Structure Preservation. Consider the attested alternations alongside those predicted to obtain with Static Structure Preservation:

(12)

	Predicted		Attested
i.	N+p	*mp	mb
ii.	N+s	*ns	s (*ns)
ii.	N+z	*nz	nj
iii.	N+ɣ	*ŋɣ	ŋg
iv.	N+l	*nl	nd
iv.	N+w	*ŋw	ŋgw

Only in the case of voiceless fricative-initial forms does Static Structure Preservation make the right prediction. In all other cases, the process is able to apply, though in every successful application are there additional rules required in order that

Structure Preservation is re-achieved. These facts would strongly indicate that it is Active Structure Preservation that may successfully account for the data.

Unfortunately, Active Structure Preservation would additionally predict that voiceless fricative-initial forms should be able to undergo the process of prenasalization, resulting in an intermediate violation which is subsequently repaired by rules triggered by the principle:

(14)		Predicted	Attested
	i.	mf	f (*mf)
	ii.	ns	s (*ns)

Active Structure Preservation predicts that voiceless fricative-initial forms should just as readily optionally take prenasalization as other forms do.

It thus seems that neither Static nor Active Structure Preservation will fully account for the data. We might preliminarily investigate a third alternative, something falling in-between the two aforementioned approaches. It might be the case that Structure Preservation possesses reparative powers on an intermediate violation, but only to a limited extent. That is, if an intermediate lexical violation requires the application of X number of rules, or type Y rule, Structure Preservation may trigger their application. However, if an intermediate violation requires X+1 number of rules, or type Z rule, in order for Structure Preservation to be re-achieved, the entire process fails. While the data from Nchufie are seemingly insufficient to confidently zero in on the value of X, or rule type Z, a quick glance at the data would suggest that such a hypothesis is tenable. Specifically, attested prenasalized forms are far less distinct from their underlying forms than those otherwise predicted to surface in unattested forms.

4. Harmonic Phonology

In the theory of Harmonic Phonology (or Optimality Theory) (Goldsmith 1991, Prince and Smolensky 1992, McCarthy and Prince 1992), the phonological component consists of a ranked, violable set of constraints which determine well-formedness. While a given input may be subject to a potentially infinite number of grammatical analyses, the output form is that which best satisfies the well-formedness constraints. At different grammatical levels, constraints may be differently ranked.

For present purposes, the relevant constraints are PARSE (which incorporates each phonological/morphological element into hierarchical prosodic structure), and *NF (which disallows nasal - voiceless fricative sequences).

In the case of obligatory prenasalization, PARSE is ranked higher than *NF, (indicated in (14) by its columnar precedence).

(14) Obligatory Prenasalization

input: N+F

	Candidates	PARSE	*NF
☞	NF		*
	F	*!	

While a structure of the form [NF] violates *NF (indicated by '*'), [F] violates the higher ranked PARSE. This higher-ranked violation thus rules out [F] (indicated by '!'). [NF] is thus the best-formed candidate, i.e., the output form (indicated by '☞').

In the case of optional prenasalization, *NF is ranked higher than PARSE.

(15) Optional Prenasalization

input: N+F

	Candidates	*NF	PARSE
	NF	*!	
☞	F		*

In (15), while [F] violates PARSE, [NF] violates higher-ranked *NF.

5. Conclusion

Within the theory of Lexical Phonology, optional prenasalization in Nchufie suggests that two types of Structure Preservation may play a role within a single phonological system. Similarly, within the theory of Harmonic Phonology, the Nchufie data may be analyzed as being subject to two distinct constraint rankings, depending on the grammatical level at which prenasalization takes place.

Appendix: Elicited Adjectives

Class A		Class B	
wu:	(short)	wu:	(amazing)
la:	(sticky)	ʃyɛ	(long/tall)
lyɛ	(clean)	zɔ	(itchy)
lwi	(bitter)	pu:	(left over)
zɔng	(dry)	pɔgo	(good)
ɣə	(cold)	puɥpuɥ	(spoiled)
ɣoɣo	(foolish)		
fufu	(white)		
fuo	(bright)		
ʃi	(black)		
ʃyɛ	(split)		
k^ha:	(small)		
p^hu:	(ugly)		
puɥguɥ	(red)		

REFERENCES

Borowski, T. 1986. *Topics in the Lexical Phonology of English.* PhD. Dissertation, University of Massachusetts, Amherst.

Clements, G.N. and S.J. Keyser 1983. *CV Phonology.* MIT Press, Cambridge, MA.

Goldsmith, J. 1991. 'Phonology as an Intelligent System,' in D.J. Napoli and J. Kegl, eds., *Bridges Between Psychology and Linguistics.* Lawrence Erlbaum Associates, Hillsdale, NJ.

Herbert, R.K. 1986. *Language Universals, Markedness Theory and Natural Phonetic Processes.* Mouton de Gruyter, Berlin.

Jun, J.H. To Appear. 'An analysis of Bafanji Prenasalized Consonants'. *Linguistics in the Morning Calm III.*

McCarthy, J.J. and A.S. Prince 1992. *Prosodic Morphology I,* Ms., University of Massachusetts at Amherst and Rutgers University.

Myers, S. 1991. 'Persistent Rules'. *Linguistic Inquiry* 22:315-334.

Kiparsky, P. 1982. 'Lexical Morphology and Phonology'. *Linguistics in the Morning Calm I.*

_____. 1985. 'Some Consequences of Lexical Phonology'. *Phonology Yearbook 2.*

Prince, A. and P. Smolensky 1992. *Optimality: Constraint Interaction in Generative Grammar*, Ms., Rutgers University and University of Colorado at Boulder.

Trigo Ferre, R.L. (1988) *On the Phonological Derivation and Behavior of Nasal Glides*, PhD dissertation. MIT.

THE TONES OF NCHUFIE VERBAL INFLECTION*

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0. Introduction

This paper is concerned with the tonal patterns of inflected monosyllabic verbs in Nchufie. We assume that Nchufie verbs fall into two types: ∅-tone and L-tone verbs. Verbs of the same class behave identically in terms of the tones of their verbal inflection. The inflections of L-tone verbs differ from those of ∅-tone verbs in that they have an extra L (=low) tone. The relevant contrasts are summarized in tables (1) and (2) below, where *cigi* 'push' and *sugu* 'pull' are representatives of the ∅-tone and L-tone verb classes respectively. For example, (1a) contrasts the future forms of *cigi* and *sugu*: the ∅-tone verb *cigi* has only H (=high) tones, whereas the L-tone verb *sugu* has a L-tone followed by a H-tone. We are assuming that none of the tones in (1) and (2) are default tones. In other words, the tones of verbal inflection all originate as lexical tones of the relevant verbs, moods, and tenses. The abbreviations used below are:

I = imperative;
H = hortative;
P = present and past;
F = future;
PERF = present and past perfect;
PROG = present and past progressive.

(1)	Tense	'push'	'pull'
a.	F	cígí	sùgú
b.	H	cígí	súgù
c.	P,I,PERF	cígì	sùgû
d.	PROG	cígǐ:	sùgū:

* I would like to thank our Nchufie consultant Sophie Ajeakwa for her patiance, and Bruce Hayes for some crucially helpful comments. All errors are mine.

(2)	Tense	'push me'	'push them'	'pull me'	'pull them'
a.	F,I,PERF	cígí wə̂	cígí ɣó	sùgù wə̂	sùgù ɣó
b.	H	cígí wə̂	cígí ɣó	súgú wə̀	súgú ɣō
c.	P	cígí wə̀	cígí ɣō	sùgú wə̀	sùgú ɣō
d.	PROG	cígì wə̂	cígì ɣó	sūgù wə̂	sūgù ɣó

In particular, note the following contrasts:

A. The verb tones depend on verb class and tense/modality. The verbs in (3a) and (3b) are ∅-tone and L-tone verbs respectively, both in the hortative form. The ones in (3b) and (3c), on the other hand, are both L-tone verbs, but in the hortative and present forms respectively.

(3) a. pó cígí
'let them push'

b. pó súgù
'let them pull'

c. pó súgû
'they pull'

∅-tone verbs in the hortative surface with a H-tone, while with the L-tone verbs, the L anchors on the final syllable and the initial syllable surfaces with a H-tone. In the present on the other hand, the L-tone surfaces as the second member of a falling (HL) contour on the last syllable.

B. The tones of both L-tone and ∅-tone verbs may change when an object pronoun is added. The following is an example with a L-tone verb.

(4) a. pó súgù
'let them pull'

b. pó súgú wə̀
'let them pull me'

The L-tone on the verb appears on the object pronoun, while its original syllable now carries a H-tone.

C. The object pronoun tones depend on verb class (5a-5b), tense or modality (5b-5c), and the choice of pronoun (5c-5d):

(5) a. pó súgú wə̀
'let them pull me'

b. pó cígí wə̂
'let them push me'

c. pó cígí wə̀
'they push me'

d. pó cígí wūṵ̀
'they push us(dual)'

The same pronoun has a L-tone after the hortative form of a L-tone verb and a falling (HL) tone after the hortative form of a ∅-tone verb. And after the present form of the ∅-tone verb, the pronoun appears with a L-tone and not the falling tone HL we observed in the hortative.

In this paper I argue that this surface complexity is the result of the interaction of three simple factors:

(6) a. The lexical tones of verb stems, verb affixes, and object pronouns.
b. A simple left to right tonal mapping procedure whose domain is the verb stem with its affixes.
c. A tone shift rule that shifts the last tone of the verb to the object pronoun.

Section 1 introduces the relevant background assumptions about Nchufie phonology and syntax. Section 2 presents and analyzes the tonal contrasts between verbs without objects. Section 3 extends the analysis to account for the tones of verbs with prononimal objects. The appendix contains spectrograms supporting a crucial prediction of the tone shift rule argued for in section 3.

1. Background Assumptions

The surface tones in Nchufie are H (high), L (low), M (mid) and SH (superhigh). Vowels are the only tone bearing units. The M at the surface is derived from a LH sequence that is linked to a single vowel. SH is probably lexical, since it only appears as part of past tense morphology. Downsteps (every non-L tone in a given domain is lowered proportionally) are distinct from downdrifts (gradual pitch lowering during utterance) and are caused by floating L tones.

Tense, aspect, and perhaps mood morphemes are heads selecting for a verb form with a particular tonal pattern. For example, the perfective *kaa* in (7) is a free preverbal morpheme, comparable to perfective *have* in English. It selects for a verb stem with a HL suffix, comparable to *-en* in English.

(7) pó káà cígì
they PERF push+HL
'they have pushed'

The past and future tenses are tonal affixes on the subject, SH and H respectively. The aspectual progressive *cuɔ* and perfective *kaa* are free preverbal morphemes. Past, future, and progressive select a complement with a nasal prefix that carries a floating low tone. For example, contrast (5) above with (8) below, in which a past tense was added. (The raised ! stands for a downstep.)

(8) pɔ́ːˊ ˡŋkáà cígì
they+PAST n+PERF push
'they had pushed'

In the rest of this paper we abstract away from both the nasal prefixes and the downsteps they cause, and concentrate only on the tonal morphology of the inflectional forms we have mentioned above.

2. Verbs without Objects

The tonal patterns of stems of verbs without objects are as in (9) (=1):

(9)	Tense	'push'	'pull'
a.	F	cígí	sùgú
b.	H	cígí	súgù
c.	P,I,PERF	cígì	sùgû
d.	PROG	cígǐː	sùgûː

These patterns can be analyzed as follows:

a. The two verbs in (9) belong to two different verb classes, which are distinguished by their lexical tones. *cigi* is a ∅-tone verb, i.e., a verb with no lexical tone. *sugu* is a L-tone verb, i.e., a verb with a lexical L tone.

b. The different tenses, aspects and moods select for verb stems with different tonal affixes. These affixes are given in (10).

(10) Tonal affixes

F	-H
H	H-
P,I,PERF	-HL
PROG	-HLH

c. Tones are mapped to the verb stem by the simple tonal mapping procedure in (11).

(11) Tonal mapping procedure
domain: word
direction: left to right
procedure: 1 to 1
extra tones mapped to the last TBU
extra TBU mapped to the last tone

We assume that each application of the tone mapping rule is followed by the OCP, but in the cases discussed in this section, its application is always vacuous, as no adjacent syllables carry an identical tone.

The tonal patterns predicted by the analysis in (a)-(c) are summarized in (12). The match between (12) and (9) is complete.

(12)

a. F	H ∧ cigi	L H | | sugu
b. H	H ∧ cigi	H L | | sugu
c. P,I,PERF	HL | | cigi	L HL | V sugu
d. PROG	HLH | V cigi:	L HLH | |V sugu:

In (12a), the future suffixal tone attaches to the ∅-tone verb to give *cígí* and to the L-tone verb to give *sùgú*. In (12b), the hortative prefix H- again attaches to the ∅-tone verb *cigi* to give *cígí*, while its attachment to the L-tone *sugu* gives *súgù*. In (12c), the -HL suffix of the past/present, imperative and perfective yields *cígì* with the ∅-tone *cigi*, and *sùgû* with the L-tone *sugu*. In (12d), the -HLH suffix of the progressive gives *cígǐ:* and *sùgŭ:*. A LH sequence on a single syllable becomes a mid tone M.

3. Verbs with Pronominal Objects

The tonal patterns of stems of verbs with objects are summarized in (13) (=2).

(13)	Tense	'push me'	'push them'	'pull me'	'pull them'
a.	F,I,PERF	cígí wə̂	cígí ɣó	sùgù wə̂	sùgù ɣó
b.	H	cígí wə̂	cígí ɣó	súgú wə̀	súgú ɣō
c.	P	cígí wə̀	cígí ɣō	sùgú wə̀	sùgú ɣō
d.	PROG	cígì wə̂	cígì ɣó	sūgù wə̂	sūgù ɣó

These patterns can be analyzed as follows:

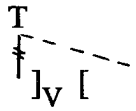
a. The lexical tones of the verbs are the same as above; i.e., *cigi* is a ∅-tone verb and *sugu* is a L-tone verb. The lexical tones of the object pronouns are L for the first singular *wə* and H for the third plural *ɣo*.

b. The tonal affixes selected by the tenses, aspects, and moods are the same as in (b) above. The only exception is that in the presence of an object pronoun, the imperative and perfective suffixes are shortened from -HL to -H so they pattern with the future instead of the past.

c. The tonal mapping procedure is the same as above. The OCP still follows each tonal mapping.

d. There is a tone shift rule that shifts the last tone of the verb to its object pronoun. The rule can be formulated as in (14).

(14) Tone shift rule



This rule applies maximally, relative to constraints on well-formedness. In particular, there is a constraint against toneless verbs. So the last tone of the verb, which is always linked to the pronoun, delinks only if this does not leave the verb toneless. The tonal mapping rule reapplies to the verb stem, in order to assure that each tone bearing unit of the verb is mapped to some tone.

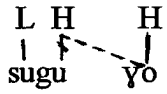
The interaction of these rules can be seen in (16) below, which is the derivation for (15).

(15) sùgù ɣó
pull+IMPER them
'pull them!'

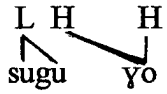
(16)

		L H	H
a.	Tonal Mapping	sugu	ɣo
b.	OCP	vacuous	

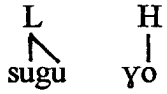
c. Tone Shift



d. Tonal Mapping



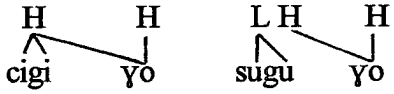
e. OCP



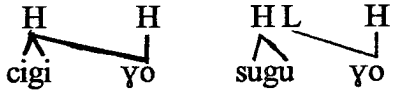
The representations in (17) and (18) obtain after the second tonal mapping and before the final OCP, that is, after the stage illustated in (16d). In (17), the pronoun is the H-tone *yo*; in (18), it is the L-tone *wə*.

(17)

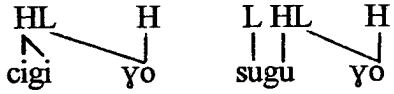
a. F,I,PERF



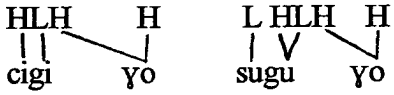
b. H



c. P

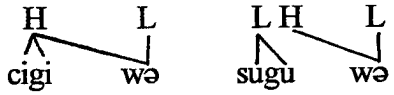


d. PROG

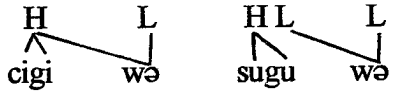


(18)

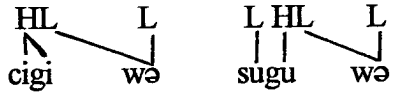
a. I,PERF,F



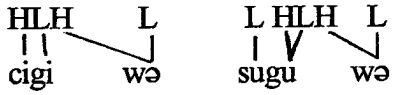
b. H



c. P



d. PROG



The only discrepancy between the predictions and the facts is observed with the L-tone verb *sugu* in the progressive form, with a *yo* object in (17d) and a *wə* object in (18d). We predict *sùgû yó* in (17d) and *sùgû wə̂* in (18d), but obtain *sūgù yó* and *sūgù wə̂* in (13d). The conversion of the LHL on the verb to ML is perhaps due to a preference

of avoiding contour tones on non-last syllables, but more work is needed before any conclusion can be reached.

4. Summary

In this paper I analyzed the tonal patterns of monosyllabic verbs in Nchufie. The complex tonal surface patterns were argued to be the result of the interaction of three simple factors: The lexical tones of the relevant verb stems, verb affixes, and object pronouns; a simple left to right tonal mapping procedure whose domain is the verb stem with its affixes; and a tone shift rule that shifts the last tone of the verb to the object pronoun.

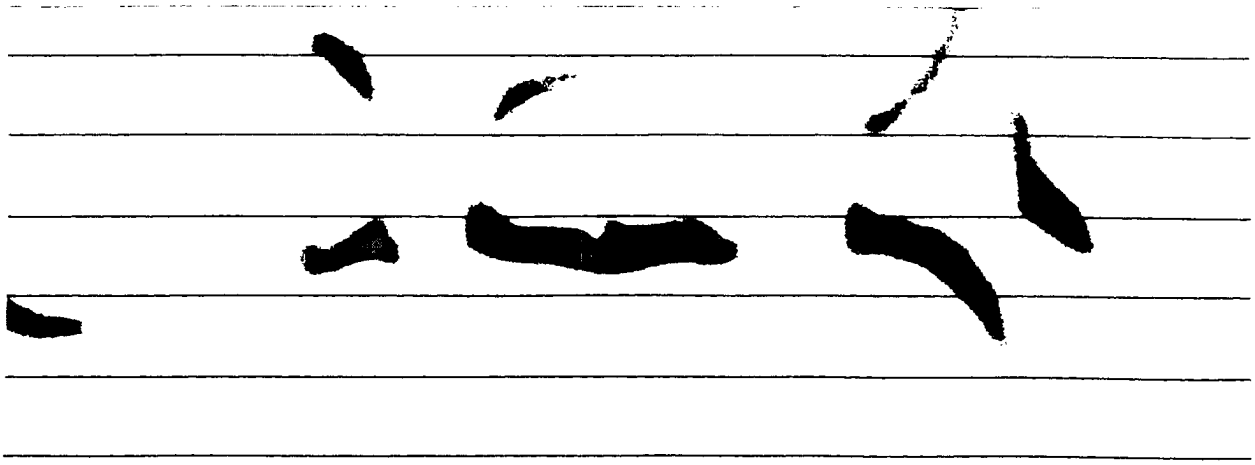
Appendix

A crucial prediction of this analysis concerns the forms in (i). We worked on the assumption that the tone on the pronoun *wə* is HL in *cígí wə̂* in (13a) and (13b), and L in *súgú wə̀* in (13c) and *cígí wə̀* in (13d). In actual speech, however, the tones on *wə* sound as ML in all four cases. To see if this is due to the interference of the initial sonorant [w], we asked the consultant to 'hum' the sentences using a fixed syllable with a voiceless onset. The narrow band spectrograms on the following page confirm our suspicion that the pronouns have the phonological tones we predict, and the apparent ML is a phonetic phenomenon that is conditioned by the initial sonorant [w].

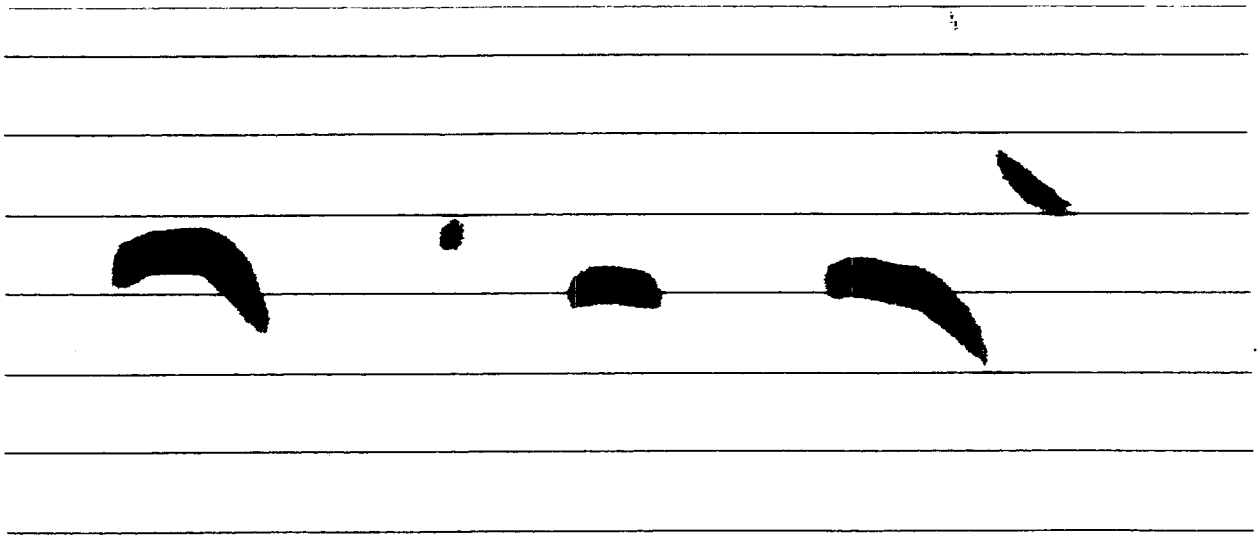
(i)	a.	F,I,PERF	cígí wə̂
	b.	H	cígí wə̂
	c.	H	súgú wə̀
	d.	P	cígí wə̀

In (i.a) and (i.b) the pronoun is HL, and in (i.c) and (i.d) it is L.

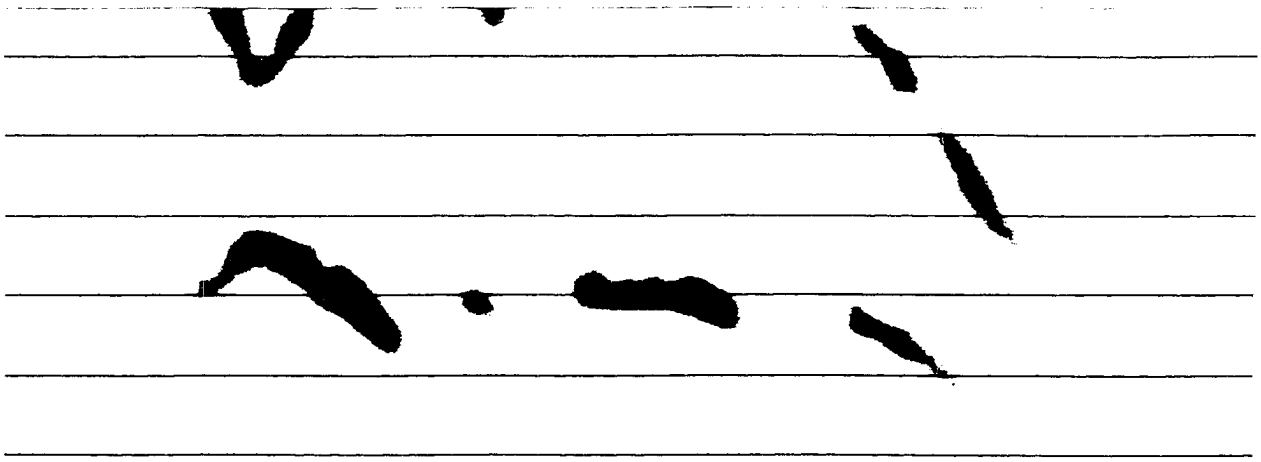
Spectogram 1: [cígí wə̂] 'push me' F,I,PERF



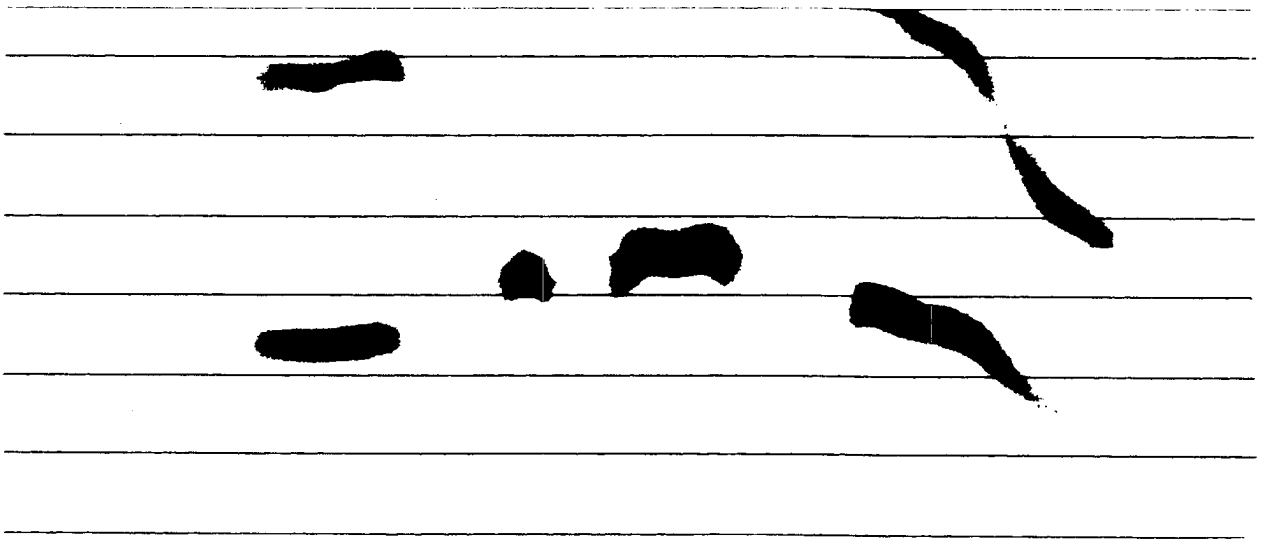
Spectogram 2: [cígí wə̂] 'push me' H



Spectogram 3: [súgú wə̀] 'pull me' H



Spectogram 4: [cígí wə̀] 'push me' P



ASPECTS OF THE MORPHO-SYNTAX OF NCHUFIE NOMINALS

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0. Introduction

The purpose of this paper is to provide a descriptive account of some morpho-syntactic facts about nominals in Nchufie -a Grassfield Bantu language spoken in North West Cameroon. Nchufie morphology is essentially tonal. We can therefore not talk of its morphology without talking about its tone system as well. After a brief exposition of some facts about its morphology, we will try to account for some of the agreement and tonal perturbations that characterize Nchufie nouns in isolation and in context. The result of our investigation will establish the validity of certain assumptions that we start with basically on comparative-historical grounds.

1. Nchufie Nominals

Nchufie is a noun class language. Therefore nouns in Nchufie pattern according to gender and number. With the exception of a few mass nouns, each gender is made up of two classes -a singular and a plural pair- as in (1).

(1) a. kɔ́ŋ / mʉ̀kɔ́ŋ 'bed/s'
b. múmbû / mbómbû 'dog/s'
c. fàà / mʉ̀fàa 'work' (sing./plural)

Observe from (1) that almost all singular nouns have a Ø-prefix whereas all plural nouns have some kind of prefix: either *mʉ̀-* or *mbɔ́-*. Nouns like *mútaŋ* 'sheep' appear to constitute an exception to the rule that singular nouns have a Ø-prefix but as we will show later this is not the case. Following recent theoretical developments (see for example Carstens (1991)) we are going to assume that the class (gender) to which a noun belongs is a lexical property of the noun, whereas the number features are a syntactic property which is spelled out on the noun prefix.

1.1. Nchufie Noun Classes

Following is a table of the Noun classes of Nchufie. The criteria used in setting up the noun classes is the possessive agreement modifier that a particular noun selects. Noun classes in Nchufie are determined by agreement rather than by noun prefix, because most noun prefixes in most of Grassfield Bantu languages have been lost. Moreover, Grassfield Bantu languages do not show any correlation between noun prefixes and the classes to which nouns belong. Thus taking the agreements selected by the nouns rather than the noun prefixes, we are able to establish four noun classes in Nchufie. This appears to be an unusually small number of noun classes for a Noun class language. In table 1 below, the different noun classes are listed with their identifying concord elements followed by a brief discussion of each class. As the classes are really reduced, we would not attempt to correlate say the noun class numbering with the traditional system used in the literature on Bantu. Instead, we refer to each noun class by the form of the first person genitive pronoun that the nouns of the particular class select. For example, ***yə̂*** -class, ***mǵŋə̀*** class... where *yə̂* and *mǵŋə̀* are the first person possessive pronouns- 'my'.

Table 1 Nchufie Noun Classes.

Class	Examples	Gloss	Possessive Pron. Agreement				
				Sing.	Dual		Plural
	ø-kwincɔ̀	lip					
yə̂	ø-pùŋ	belly	1	yə̂	yṵ̀ṵ̀	incl.	yíɛ̀
(sing.)	ø-kɔ́ŋ	bed				excl.	zɯgɯ́
	mú-tə̂ŋ	sheep (sg.)	2	ɔ̂			zaí
			3	ɛ́			zó
mǵŋə̀	mɯ̀-kwincɔ̀	lips	1	mǵŋə̀	mṵ̀ṵ̀	incl.	mǵiɛ̀
(pl.)	mɯ̀-pùŋ	bellies				excl.	mɯŋɯ́
	mɯ̀-kɔ́ŋ	beds	2	mɔ̂			maí
			3	mɛ́			mó

wə̀	ø-ŋgɔ̀	stranger	1	wə̂	wʉ̂ʉ̀	incl.	wʉ̂ɛ̀
(sing.)	ø-ncɔ̀	mouth				excl.	vɯgɯ́
	ø-sɔ́ŋ	friend	2	ɔ̂			waí
	ø-ǹjíŋ	brother	3	ɛ́			ɣwó
pəgə̀	mbó-tâŋ	sheep (pl.)	1	pə́gə̀	pʉ̂ʉ̀	incl.	pʉ̂ɛ̀
(pl.)	ø-sɔ́ŋ	friends				excl.	pɯɣɯ́
	ø-ziŋ	brothers	2	pɔ̂			paí
	ø-kʉ́nà	pigs	3	pɛ́			pó
	ø-mbû	dogs					
	ø-paí	children					

1.2. Discussion of the Noun Classes.

There are four noun classes in Nchufie. These four classes can be grouped by pairs of singular/plural to constitute two genders as follows:

	sing.	~ plural
gender A:	yə̂	mə́ŋə̀
gender B:	wə̂	pə́gə̀

As stated above we refer to the classes by the first person genitive pronoun. The following is a brief discussion of each of the classes.

The **yə̂** -class : This is a singular noun class. Nouns in this class typically have a Ø-prefix. The plural pairings of this noun class typically have a *mʉ̀-* prefix and are in the *mə́ŋə̀-* class as (2) shows. (see also Table 1).

(2) a. ø-kwincɔ yə̂
lip my 'my lip'

b. mʉ̀-kwincɔ mə́ŋə̀
lips my 'my lips'

There are a few exceptions to the above generalization. These include singular nouns in the ***yə̂-*** class that apparently have a prefix *mú-* . Such nouns can have their plural pairings in either the ***pə́gə̀***-class with a ***mbó-*** prefix or in the expected *míŋə̀-* class with a 'double' prefix (*mʉ̀-mbó-*) as we see in (3b).

(3) a. mútaŋ yə̂
sheep my 'my sheep' (sing.)

b. mʉ̀mbótâŋ míŋə̀
sheep (pl.) my 'my sheep' (pl.)

c. mbótâŋ pə́gə̀
sheep (pl.) my 'my sheep' (pl.)

The alternant plural forms shown in (3b) and (3c) are typical of the semantic class 'animals' that have a *mú-* prefix for the singular and a *mbó-* prefix for the plural forms. Later we will argue that the phenomenon represents linguistic change in progress and that a reasonable way to account for the data is to reanalyze the prefixes *mú-* and *mbó-* as part of the stem.

<u>The **míŋə̀** -class</u>: As we have seen above the nouns in this class are plural nouns. They generally bear the prefix ***mʉ̀-*** . Their singulars are in the ***yə̂-*** class. The ***míŋə̀*** - class forms a fairly unified noun class.

<u>The **wə̂** -class</u>: This is also a singular class. As we will see, the ***wə̂-*** class is a very irregular noun class. The nouns generally have a Ø-prefix; a few nouns like *məŋgyɛ́* 'woman/wife' have a ***mə-*** prefix. The plural of this noun class is the ***pə́gə̀-*** class.

<u>The **pə́gə̀** class</u>: Nouns in this class are plural nouns. The ***pə́gə̀-*** class does not form a unified class. Some of the plurals can optionally have a Ø- prefix as we see in (4). With certain nouns the singular / plural pair bears no morphological resemblance at all as in (5)

(4) a. ømba wə̀ ~ ømba pəgə
father my fathers my 'my father/s'

b. ømba wə̀ ~ mʉ̀mba míŋə̀
father my fathers my 'my father/s'

c. øsɔ́ŋ wə̀ ~ sɔ́ŋ pə́gə̀
friend my friends my 'my friend/s'

d. øsɔ́ŋ wə̀ ~ mʉ̀sɔ́ŋ míŋə̀
friend my friends my 'my friend/s'

(5) a. øŋɔ̀ wə̀ ~ økpʉ́íŋ pə́gə̀
person my persons my 'my person/s'

b. ømíŋ wə̀ ~ øpaí pə́gə̀
child my children my 'my child/ren'

What does such alternation in (4) suggests? It is probably just part of the historical change towards reduction in the number of noun classes that some of the nouns are still undergoing. It is not uncommon in Grassfield Bantu languages that one (plural) prefix becomes more generalized and gets extended to new noun classes that originally had no prefix or even replace the prefixes that such classes originally had. In Nweh for example the *bə-* plural prefix is being extended to new classes. Our guess is that a similar process is in operation in Nchufie with the *mɯ̀-* prefix.

1.3. Accounting for the Noun Class Irregularities

We have seen that nouns of the ***pə́gə̀-*** class have a Ø-prefix with their singular forms in the ***wə̀-*** class. We noted that there were some exceptions with nouns like ***mbótâŋpə́gə̀*** 'my sheep(pl.)' as well as with nouns like *mə́sɨgɯ́* ' bird', *mə́mbû* ' dog', *mə́ŋgû* ' chicken' and others that meet the semantic ([+animal]) and morphological (*mə́-* ~ *mbó-* 'prefix') requirement.

(6) a. mə́sɨgɯ̂ yə̂
bird my 'my bird'

b. mbósɨgɯ̂ pə́gə̀
birds my 'my birds'

c. mɯ̀mbósɨgɯ̂ ḿŋə̀
birds my 'my birds'

We have so far considered *mbó-* as a prefix because in certain cases it alternates with a Ø-prefix as in *mbómbû* ~*mbû* 'dogs'. However, it is possible that plural nouns with *mbó-* such as ***mbótâŋ*** 'sheep' have just one morpheme. As such nouns like *mbótâŋ* would have the Ø-prefix of the *pə́gə̀-* class and the *mɯ̀-* prefix of the *ḿŋə̀* - class. This would make the plural forms look perfectly regular. But the question remains as to whether nouns like *(mɯ̀)mbótâŋ* 'sheep' that exhibit the sort of dual behavior we have illustrated above, do belong to two different noun classes. Given what we know about noun classes the answer is clearly negative. To account for the behavior of such nouns we will resort to history. We will claim that the *mɯ̀-* prefix is being extended to nouns that originally had a prefix *mbó-*. Because of this the original prefix is being reanalyzed as part of the stem. The most likely origin of this is borrowings. Notice that most, if not all, borrowed words in Nchufie have a Ø-prefix in the singular and a *mɯ̀-* prefix in the plural.

(7) a. ø-tablə ~ mɯ̀-tablə 'table/s'
b. ø-ŋgletâ ~ mɯ̀-ŋgletə 'grater/s'
c. ø-čiča ~ mɯ̀-čiča 'teacher/s'
d. ø-kɔ́p ~ mɯ̀-kɔ́p 'cup/s'

We will argue that faced with the task of expressing the plural for borrowed vocabulary items such as these, Nchufie speakers have simply 'abduced' a grammar from the output of other grammars. Thus the *mɯ̀* - prefix gets extended to borrowed forms and consequently gets an edge over the other plural prefixes. This appears to be a case of 'abduction' (Andersen 1973, see also Anttila 1989). As a matter of course, as children acquire Nchufie, they will encounter *mɯ̀*- as the most widely distributed prefix as they in turn 'abduce' a grammar from which their own (verbal) output is inferred. The *mɯ̀*- prefix is eventually extended even to some plural nouns that had prefixes other than *mɯ̀*- especially if such prefixes have low frequency of occurence. When this happens the original prefix might then be reanalyzed as part of the stem. However, before such 'opinionated' grammar outputs can be incorporated into the language they must undergo inductive testing. With borrowed words inductive confirmation of the output is relatively easy; with 'indigenous' vocabulary the process might take a while, during which we get competing forms of the sort seen in Nchufie, cf. *mbótâŋ* ~ *mɯ̀mbótâŋ* 'sheep' (pl.) *mbómbû* ~ *mbû* 'dogs'.

2. Morphological Structure of the Noun

As we observe from table 1, only four prefixes occur regularly in Nchufie: *Ø*-, *mú*-, *mɯ̀*-, *mbó*-. The structure of the noun may be conveniently analyzed as consisting of a prefix and a stem. The morphological structure of the noun prefix may be:

CV-	e.g.,	*mɯ̀*- as in *mɯ̀kɔ́ŋ*	'beds'
N-	e.g.,	*m*- as in *m̀pɯ́ŋ*	'breasts'
Ø-	e.g.,	[ ] as in *kɔ́ŋ*	'bed'
CCV-	e.g.	*mbó*- as in *mbómbû*	'dogs'

As we have seen, some of these prefixes occur in nouns that have singular meaning, others occur in nouns with plural meaning, while there are some that occur in both singular and plural nouns.

The morphological structure of the stem can be any of the following:

CV	e.g., nɔ̂	'snake'
CVV	e.g., lɛ́ɛ̀	'village'

CVN	e.g., sɔ́ŋ	'friend'
NCV	e.g., mbɛ́	'hill'
NCGV	e.g., njwǐ	'cloth'

All nouns begin with a consonant. There are no nouns (or for that matter words of any major lexical category) that begin with a vowel. This is a little bit surprising given the fact that in most Bantu languages that have noun classes, (singular) nouns always have a vowel as one of the possible prefixes.

We will want to maintain that most of Nchufie nouns have simply lost their (vowel-initial) prefixes. Such a claim is supported by the syllable patterns that we observe for nouns.

Most Nchufie nouns are monosyllabic, consisting of a Ø-prefix and a stem. There exist a fairly large amount of bisyllabic nouns. The majority of bisyllabic nouns fall within the plural classes and typically are composed of a monosyllabic prefix and a monosyllabic stem. There are very few trisyllabic nouns. There appear to be no nouns with more than three syllables.

3. Pronouns

Nchufie has one pronoun each corresponding to the first, second and third person singular as well as for the second and third person plural. For the first person plural, there are three pronominal forms: a dual 'we-two', one exclusive 'we, but not including you', and one inclusive 'we, all'. The following are Nchufie subject pronouns:

	Singular	Plural	
1	mà / n	pùú	(dual)
		pʉ̀gʉ́	(excl.)
		pǐɛ́	(incl.)
	Singular	Plural	
2	ɔ̀	pàí	
3	á	pó	

Object pronouns and possessive pronouns pattern along the same lines, where there is one pronoun each for first, second and third person singular and for the second and third person plural, but three pronominal forms for the first person plural.

4. Noun Modifiers

In the NP, nouns take different sorts of modifiers as we see in (8) below:

(8)	a.	mín	wə̀	'my child'
		child	my	
		kɔ̂ŋ	yə̂	'my bed'
		bed	my	
	b.	tɯ́	yɨ̀í	'this tree'
		tree	this	
		mɛ́ɛ̀	wɨ̀í	'this child'
		child	this	
	c.	ǹyɛ́no	tɯ́	'which tree'
		which	tree	
		pɨ̀ɛ́nô	mɯ̀tɯ́	'which trees'
		which	trees	
	d.	tíɛ̀	lɛ́ɛ̀	'one village'
		one	village	
		pɨ̀á	mɯ̀lɛ́ɛ̀	'two villages'
		two	villages	
	e.	kɔ́ŋ	fùɔ	'the chief's bed'
		bed	chief	
		fùɔ	lɛ́ɛ̀	'the chief of the village'
		chief	village	

In (8a) a noun takes a possessive pronominal qualifier; in (8b) the noun is modified by a demonstrative; in (8d) by a numeral quantifier; in (8c) it is a Wh-question word, and in (8e) it is another noun. We observe that although in the majority of cases the modified or head noun precedes its modifier, it is not an everywhere phenomenon. In (8c) and (8d) we observe that the modifier precedes the head-noun. This would suggest some freedom with respect to the ordering between the head noun and some of the specifiers.

There is one generalization that comes across from the examples in (8): They all involve some kind of agreement relation holding between the head noun and its modifier. We can therefore say that Nchufie NPs display overt agreement. While the agreement relation is obvious for the examples in (8a) - (8d), it is less obvious in examples like (8e) where one noun is modified by another noun. In these cases we will show that an agreement relation still holds but that it is 'hidden' at the segmental level, and it is marked tonally. Below we will try to derive both the segmental and the tonal agreements. We

will provide a syntactic characterization for the genitive pronoun agreement thus reducing it to the familiar Spec-head agreement phenomenon. The 'tonal agreement' appears to be the tonal 'of'-type preposition. Therefore to study these tonal alternations that characterize Nchufie nominals we will investigate what is generally referred to as the 'noun of noun' associative construction.

4.1. Deriving the Noun Class (Genitive) Agreement

In Nchufie, like in other Bantu languages, the genitive pronouns agree with the nouns that they modify in class and number. Therefore nouns of a particular class select a specific set of genitive pronouns as in (9), where we illustrate with the first person singular. (see also Table 1 of noun classes p. 58-59)

(9) a. kɔ́ŋ yə̂
bed my 'my bed'

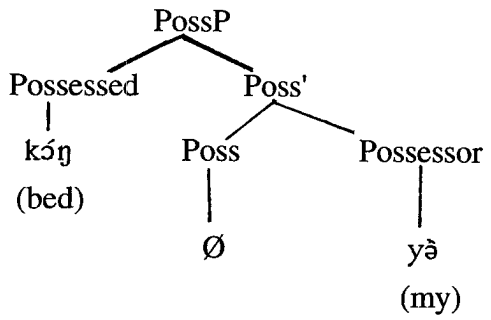
b. mʉ̀kɔ́ŋ mǐŋə̀
beds my 'my beds'

c. sɔ́ŋ wə̀
friend my 'my friend'

d. mʉ̀sɔ́ŋ pə́gə̀
friends my 'my friends'

Agreement patterns like those in (9), where the genitive pronoun agrees with the head noun in noun class and number, have often posed a serious challenge to attempts to account for the noun - genitive pronoun agreement within formal theoretical frameworks. This is because the agreement appears to be on the specifier instead of being on the head. Elsewhere (Nkemnji 1993), I have argued that such agreements can be reasonably accounted for within current syntactic theory by deriving the morphological operations within syntax. One way of doing this is by reanalyzing complex morphemes like the Bantu possessive pronouns into their component parts and then deriving these morphemes through syntactic (movement) operations. This approach has proven to be helpful in solving a number of problems. For instance, the problem of genitive agreement in the Grassfield Bantu languages, where the genitive agreement appears to be marked on the specifier of the noun, instead of the head. In the case of the genitive pronoun agreement illustrated in (9), the possessor seems to bear the agreement. One could try to argue that possession is expressed differently in these Bantu languages. In the case of Nchufie the possessed would be the subject and the possessor the object as in (10).

(10)

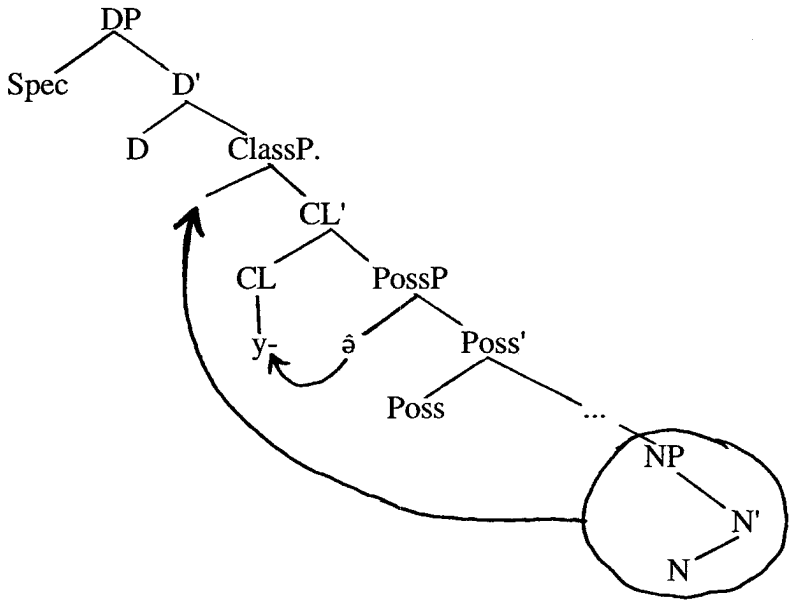


If the structure in (10) were to be correct, it would imply that every language projects the possessor and possessed roles in the same way. Otherwise, given what we know about the principles of UG, the Nchufie language learner will have no way of figuring out that Nchufie is different from all other languages in the way possession is expressed.

The solution that we will adopt here is that proposed for Nweh, and which ensures that heads indicate agreement with specifiers and not the reverse. The proposal not only ensures that possession is expressed uniformly across languages, but it also reduces the analysis of genitive pronouns in Bantu at large to independently motivated principles of current morphosyntactic theory. Moreover, the approach provides a formal syntactic account of the very important descriptive notion of Noun Classes.

Based on the 'regularity' of genitive pronouns in Nchufie (see table of Noun Classes pp. 58-59), we propose that such genitive pronouns be analyzed as bimorphemic, consisting of a class morpheme and a (clitic) pronoun. We will further propose that the class morpheme heads a functional projection. Therefore taking just class 1 first person singular genitive pronoun, ***yə́*** 'my' (9a), we will analyze it as consisting of **y + ə́** - a class morheme ***y*** - and a pronoun -***ə́***. We have claimed that ***y***- heads a functional projection; what kind of Functional head is ***y***-? Since ***y*** - represents class information, the logical name will be to call it 'Class' (analagous to neg, tense, Infl....) and by analogy this class morpheme will project a 'Class Phrase' (CLassP) or CLP. By representing the notion of class syntactically, we will show that the genitive agreement is just a case of the familiar Spec-head agreement. We will analyze ***ə́*** as a clitic pronoun. The morpheme *yə̀* 'my' is derived in the syntax through incorporation of -***ə́*** to the functional head *y*--. Noun raising to Spec of ClassP will then trigger agreement on the head as sketched in (11). (see Nkemnji (1993) for details on the derivation.)

(11)



In (11), details aside, the NP is going to raise NP to Spec ClassP. The raising will trigger agreement in noun class. Thus the class head will agree with the noun in its Spec in class and number. According to our structure in (11) *y* - takes a PossP as complement. The head of the PossP in Nchufie will basically be a tonal morpheme. Since possession expresses a relation between two NPs, we claim that -*ə̂* is a pronoun in subject position of the PossP and that it bears the possessor relation.

5. Tone on Nouns and NPs

Like most Grassfield Bantu languages, Nchufie offers an array of tonal patterns and tone perturbations. In the following section we will outline some of the general tonal properties of Nchufie. We will try to determine what sort of abstract underlying forms we have to set up in order to derive the various surface tonal alternations that we observe.

In this section we look at some of the phonetic tone patterns that occur in isolation on monosyllabic and bisyllabic nouns. We shall then propose that the phonetic tones must be different from the underlying tones. Evidence for setting up underlying tones that differ from the surface tones comes from the tone perturbation that we observe in the associative constructions.

A bulk of the nouns in Nchufie are monosyllabic, however monosyllabic nouns exhibit considerably less tonal variation than do bisyllabic nouns. The following are the commonly occuring tone patterns on monosyllabic nouns:

L	e.g.,	fùɔ	'chief';	pèe	'bag'
H	e.g.,	kɔ́ŋ	'bed';	sɔ́ŋ	'friend'
HL	e.g.,	nɔ̂	'snake'		
LH	e.g.,	ǹjiŋ	'brother'		

The following tone patterns can be found to occur on bisyllabic nouns:

LL	e.g.,	mʉ̀là	'gossip/rumor'
		fʉ̀fà	'wind'
HL	e.g.,	múnò	'sun'
		múnjùɔ	'peanuts'
HH	e.g.,	fígʉ́	'wound'
		kukwé	'bone'
LH	e.g.,	mʉ̀tʉ́	'trees'
		mʉ̀kɔ́ŋ	'beds'
HL HL	e.g.,	mûmbí	'goat'
H M	e.g.,	mútāŋ	'sheep'

Most bisyllabic nouns also lack a noun prefix. When there is such a prefix it generally bears low tone. An exception is the ***mʉ́ ~ mbó*** prefixes which bear high tone. We have suggested above that these prefixes are in the process of being reanalyzed as part of the stem. The suggestion would actually help to regularize the morphology, as the noun class to which nouns with the *mʉ́- ~ mbó-* prefixes belong typically have a Ø-prefix.

6. The Associative Construction

The associative construction is characterized by various sorts of tone perturbation as we will show, both in the noun-noun association and in the noun-possessive pronoun association.

The associative construction expresses primarily a relation of possession as the examples in (12) illustrate:

(12) a. kʉ̀ mɛ́ɛ̀
pot child 'the child's pot'

b. kɔ́ŋ fùɔ
bed child 'the chief's bed'

c. mǐŋ wə̀
child my 'my child'

Apart from the possession relation, Nchufie uses the associative construction to express other sorts of relations between the head noun and its modifier. Some of these are given in (13).

(13) a. (place of) origin: mɛ́ɛ̀ lɛ́ɛ̀
child village 'a child of the village' ('son of the soil')

b. material make-up: kʉ̌ nčàā
pot clay 'clay pot'

c. content/purpose: kʉ̌ ǹkí
pot water 'water pot' ('a pot of/for water')

Our focus will be on the associative construction that expresses a relation of possession.

6.1. Structure of the Associative Construction

We will assume the 'noun of noun' or [$_{NP}$ N_1 + NP_2] has a structure like the one in (14).

(14) [[N_1 + AM] + NP_2] (AM=associative marker).

N_1 is the possessed or head noun and NP_2 is the possessor or the specifier in (14). The possessor, NP_2, can either be a noun or a possessive pronoun. We assume that (14) derives from a structure like (15).

(15) [$_{PossP}$ [$_{Poss}$ N_i [$_{NP\,1}$ e_i [$_{NP2}$ ...]]]

The head of NP_1 has raised to a higher position, Poss., to support the tonal features of that head, assuming that the associative marker is a tonal affix. We will see that in most cases the tone pertubation will be on N_1. This favors an analysis that assumes that N_1 has raised to a higher position in order to support the tonal morpheme. What is the motivation for saying that there is an AM that is just a suprasegment or segmentless tone? We will show that such a claim receives support from comparative and language internal perspectives. For instance there are very closely related languages spoken around the same region as Nchufie, that still retain an overt segmental AM which bears a tone as well. See for example, Schaub (1985) for Babungo, Hyman (1979) for Aghem, Leroy (1977) for Mankon, Asongwed and Hyman (1976) for Ngamambo, Hombert (1976) for Ngie. Thus, for Nchufie we will assume that the segmental element of the AM has dropped out leaving its tone and that this floating tone functions as the AM. Apart from this historical support, the fact that nouns which in isolation have identical surface tones behave differently in certain contexts constitutes internal support for the claim that there is actually a tonal associative marker between N_1 and NP_2.

We have claimed that the associative marker is a floating tone. The next empirical question is how to determine the pitch of such a floating tone? In every single paper (that I am aware of) that discusses the associative construction in Grassfield Bantu (cf. references just cited above), there is the standard assumption that the pitch of the associative tone is determined by the noun class membership of the head noun (N_1). The standard tradition is that if N_1 belongs either to class 1 or class 9, the associative tone will have a Low tone, otherwise the associative tone will be High. Herein we will show that this 'traditional' approach does not hold for Nchufie, and we will assume that the traditional approach is invalid for other Grassfield Bantu languages, particularly those in which noun classes have undergone a significant reduction in number. For instance, as we have shown above, Nchufie has only four noun classes. Observe that in (16) the associative NP in (16a) and (16b) have the same tonal pattern. The head noun in (16a) has the same (lexical) tone as that in (16b). The surface tones are the same even though the head noun in (16a) belongs to a different noun class (the **yə̀** -class) while that in (16b) belongs to the **wə̀** -class. This would not be the case if the associative tone were different for the two noun classes.

(16) a. pùŋ + nǐŋ --> pùŋ́ nǐŋ 'the stomach of the animal'
stomach + animal

b. ncɔ̀ + nǐŋ --> ncɔ̌ ǹiŋ 'the mouth of the animal'
mouth + animal

This apart, there appears to be no systematic correlation in noun class as one moves from one language to another especially given the fact that the criteria for establishing noun classes varies from one language to another. For example in languages where noun prefixes have been preserved, noun classes can be determined from the prefixes; in other languages one must establish noun classes only on the basis of genitive agreement. In some languages a combination of these two strategies must be employed. We will therefore not follow the tradition that the pitch of the AM depends on noun class membership of N_1. Rather, we will say that in Nchufie the pitch of the AM is invariably a (floating) High tone; we will then posit tone rules and conventions along the autosegmental framework, that would derive the surface tones. Why do we consider the AM to be invariant for all noun classes? We focus on the associative construction that expresses the possession relation. We know possession expresses a relation between two NPs/DPs. The most logical approach should therefore be one that expresses this relation in the same way. Nchufie does not distinguish between alienable and inalienable possession:

(17) a. pùŋ́ mɛ́ɛ̀
stomach child 'the stomach of the child'

b. nǐŋ mɛ́ɛ̀
animal child 'the animal of the child'

6.2 . Underlying Tonal Patterns

Before discussing the tone pertubation in the associative NP, a brief outline of the underlying tone patterns of Nchufie nominals is necessary. Nchufie nominals fall basically into four tone patterns: L(L), LH, H(H), HL as shown below:

L(L)	nùŋ	'hair'	LH	muɔ	'fire'
	ŋgɔ̀	'stranger'		kʉ̌	'pot'
	fàà	'work'		ŋkǐ	'water'
	nà	'cow'		njiŋ	'brother'
	ncɔ̀	'mouth'			

H(H)	kɔ́ŋ	'bed'	HL	lîi	'name'
	tʉ́	'tree'		mâ	'mother'
	sɔ́ŋ	'friend'		lɛ́ɛ̀	'village'
	kúkwé	'bone'		nɔ̂	'snake'
	nj^{w}í	'cloth'		kúnà	'pig'
				múnjùɔ	'peanut'

Contour tones are found on monosyllabic nouns; however there appear to be no contour tones on disyllabic words.

6.3. Tone Perturbation in the Associative Construction

A number of tonal perturbations operate in the Nchufie associative construction, but certain tonal alternations are very general and pretty consistent. We look at these first.

The observed surface tonal pattern is as follows:

N_1		NP_2	surface
L	+	L	LH L
L	+	L	L HL
L	+	HL	L HL
L	+	LH	LH LM
L	+	H	LH M
L	+	H	L H

It is the case that whenever N_1 ends in a Low tone and the first tone of N_2 is Low, we get a H tone popping up between N_1 and NP_2. The relevant examples follow in (18).

(18) a. nǐŋ́ + fùɔ ---> nǐŋ́ fùɔ 'the animal of the chief'
animal chief

b. fùɔ + fùɔ ---> fùɔ́ fùɔ 'the chief of the chief'
chief chief

c. fùɔ + nǐŋ ---> fùɔ́ nǐŋ 'the chief of the animal'
chief animal

d. ncɔ̀ + nǐŋ ---> nɔ̀ɔ́ nǐŋ 'the mouth of the animal'
mouth animal

e. pùŋ + nǐŋ ---> pùŋ́ nǐŋ 'the stomach of the animal'
stomach animal

However if N_2 begins with any tone other than Low, say High, we do not get the 'upgliding' on N_1. This is shown in (19):

(19) a. fùɔ + lɛ́ɛ̀ ---> fùɔ lɛ́ɛ̀ 'the chief of the village'
chief village

b. fùɔ + mɛ́ɛ̀ ---> fùɔ mɛ́ɛ̀ 'the chief of the child'
chief child

c. pùŋ + nɔ̀ ---> pùŋ nɔ̀ 'the belly of the stranger'
belly stranger

d. nǐŋ + tɯ̂ ---> pùŋ tɯ̂ 'the animal of the tree'
animal tree

The question here is why do we have the upglide, and why is it not seen when the tone on NP_2 is High? Following the pattern observed in (18) we would expect (19a) to have a tonal pattern like that in (20a); however what we get is (20b).

(20) a. *fùɔ́ lɛ́ɛ̀ 'the chief of the village'
b. fùɔ lɛ́ɛ̀ 'the chief of the village'

One other problem that shows up is that the linking of the High tone does not appear to be fixed: Sometimes it attaches to N_1, at other times it is on NP_2.

To answer the first question, we will propose that there is a H tone associative marker. We will then propose tone rules along the lines of the autosegmental framework that will derive the surface forms as well as explain the pattern of mapping the (associative) tones onto segments. We start with evidence that shows that the correlation of the associative tone with noun class membership does not hold for Nchufie.

Even though the number of noun classes in Nchufie have been reduced to just four, we know that a loose semantic correlation can be found in noun classes in languages with noun classes. For example in most, if not all, Bantu languages noun class 1 is very often a [+human] class. We can therefore easily identify correlates of noun class 1 in Nchufie. Such nouns would include ***ŋgɔ̀*** 'stranger', ***ǹjíŋ*** 'brother', ***fùɔ*** 'chief'. In Nchufie, these are mostly low tone nouns. The tonal behavior of these nouns in the associative construction is given in (21).

(21) a. ŋgɔ̀ + fùɔ ---> ŋgɔ̌ fùɔ 'the visitor of the chief'
stranger chief

b. ǹjíŋ + ŋgɔ ---> ǹjíŋ ŋgɔ̀ 'the brother of the stranger'
brother stranger

If we assume as most of the literature would lead us to, that the associative tone for examples in (21) is a Low tone, it will be very difficult to come up with general tone rules that would derive the surface forms particularly for (21a). On the contrary, if we assume as we have done, that the associative tone is a High tone, then the explanation for such data is pretty straightforward (as a High AM derives the correct form for (21a)) as well as generalized. We will therefore maintain that Nchufie has a High tone associative marker that attaches to N_1.

6.4. Tone Rules (TR)

To derive the correct surface forms from the underlying forms we will propose a number of tone rules. Given the fact that some of the tone changes found in the Nchufie genitive (associative) construction are pretty opaque, some of our rules will be restrictive in their structural description. The approach used to describe the tone changes is the autosegmental approach. The first tone rule we will discuss is the mapping of tones onto segments. We will then discuss the rule that attaches the associative tone. This will make reference to the onset of the initial syllable of NP_2 as well as to whether the first syllable of NP_2 is light or heavy.

The first tone rule which applies to underlying lexical forms is a tone mapping rule. Lexical tones are mapped onto segments, Left to Right. Let's call this Tone Rule 1 (TR1). L---> R lexical tone mapping. This rule does not dock the associative tone (T).

(22) TR 1

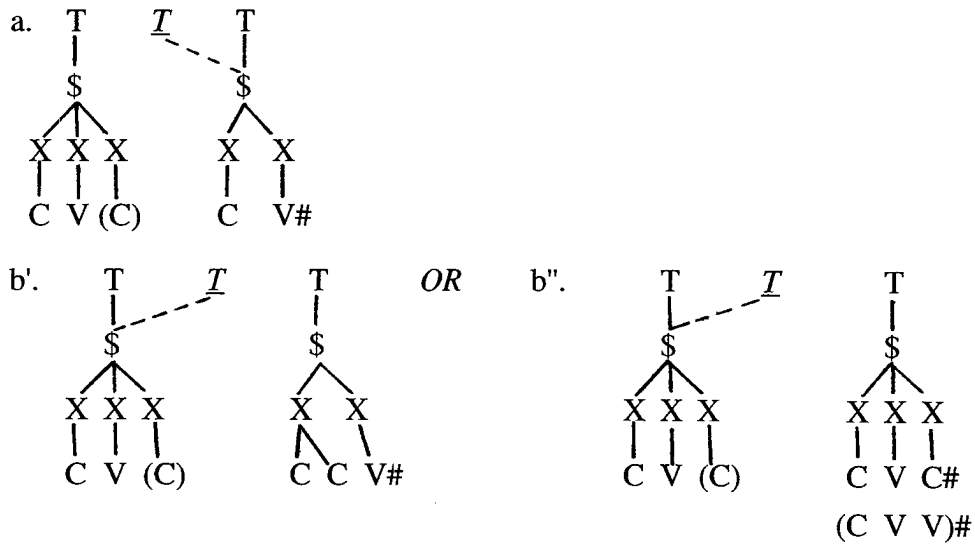
```
T   T   T   T   T
|   |       |   |
$   $       $   $
```

($ = syllable)

As we observed earlier, the associative marker sometimes links to the left, at other times it links to the right.

To state the conditions governing the attachment of the associative tone, we will show that the associative tone links to the right if the initial syllable of NP_2 is a light syllable with a non-branching onset; but if NP_2 is either heavy or has a branching onset, then the associative marker must only link to the left. This is TR 2. The two options are represented in (23).

(23) TR 2



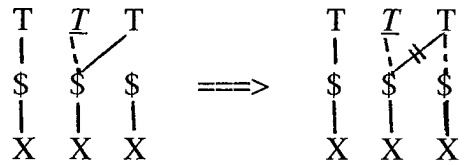
Tone rule 2 is going to account for the difference between forms like (24).

(24) a.	pùŋ + nǐŋ	--->	pùŋ́ nǐŋ	'the stomach of the animal'
b.	pùŋ + mɯnǐŋ	--->	pùŋ mɯ́nǐŋ	'the stomach of the animals'
c.	pùŋ + nà	--->	pùŋ náà	'the stomach of the cow'

Observe that the NPs in (24) have the same underlying tones. The difference in their surface tones depends on where the associative tone attaches. In (24a) it attaches to the left giving LH L, but in (24b) and (24c) it attaches (vacuously) to the right, giving L HL. (24c) also involves vowel lengthening. (24b) suggests that prefixes are toneless, and since they are mostly of the form CV-, they very often would bare the associative tone following the formulation of TR 2. However if at the end of the derivation a prefix does not get any tone assigned to it, it gets a low tone by a rule of default tone assignment .

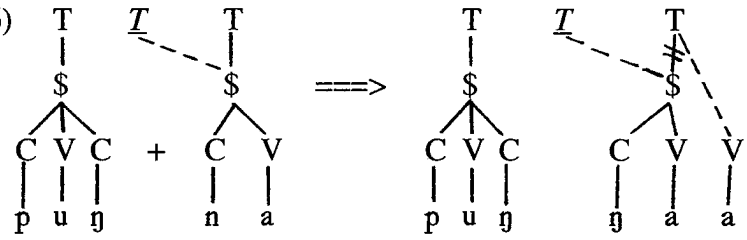
The third rule that we will propose is a Delinking rule. This rule delinks a lexical tone that is attached to same tone bearing unit (TBU) as the associative tone if there is an adjacent TBU to which the lexical tone can be attached.

(25) TR 3



This rule is especially applicable when there is vowel lengthening, cf. (24c) illustrated in (26).

(26)



In the example in (26) we observe that the final vowel of *nà* 'cow' is lengthen. We have represented this lengthened vowel as an 'extrasyllabic vowel' that links directly to the tonal tier. We assume that a late 'fix-up' rule comes in later to incorporate the lengthened vowel as part of the preceding syllable.

There are some tone changes that result from fairly standard procedures such as the Obligatory Contour Principle (OCP) that collapses identical adjacent tones when they are linked to the same TBU. Another standard rule is a downstep rule that downsteps a High tone across a morpheme boundary when it is preceded by another High tone. cf. (27). These we will simply refer to them by their names, viz. OCP and Downstep rule

(27) H ---> D / H+ -- (downstep sometimes is heard phonetically as mid.)

(28) nǐŋ + sɔ́ŋ ---> nǐŋ́ sɔ̄ŋ
L H LH D

A final assumption we make is that peripheral tones that are not associated to a TBU do not surface.

With these rules in mind we will now show systematically how the underlying forms get mapped onto the surface forms. We start with the Low tone nouns that we illustrated above.

Let's see how the tone rules are going to derive the surface forms:

(29) TR 1

```
p u ŋ     n i ŋ          p u ŋ     n a a
 \         |              \         \
  L  H     L               L   H     L
```

TR 2

```
p u ŋ     n i ŋ          p u ŋ     n a a
 | \       |              |        /|
 L H       L              L   H    L
```

TR 3

```
----------               p u ŋ     n a a
                          \        /|\ ≠
                           L   H    L
```

Output:

```
p u ŋ  n i ŋ --> pù ŋ́ nǐ ŋ        p u ŋ  n a a --> pù ŋ náà
 | |    |                          \     | |\
 L H    L                           L     H L
```

(30) TR 1

```
n i ŋ     tɯ          n c ɔ     ŋ g ɔ
 |         |            \         \
 L  H      H             L   H     L
```

TR 2

```
n i ŋ     tɯ          n c ɔ     ŋ g ɔ
 |        /|           |\ ..      |
 L  H     H            L  H       L
```

TR 3

```
n i ŋ     tɯ          ----------
 |        /|\
 L  H     H  H
          \ /
           H
```

Output:

```
n i ŋ   tɯ  ---> nǐ ŋ tɯ́        n c ɔ̌ ŋgɔ̀
 |       |
 L       H
```

(31) TR 1

```
ŋ u ŋ   s ɔ ŋ          s ɔ ŋ   n a a
 |       |              |       |
 L  H    H              H   H   L
```

TR 2

```
ŋ u ŋ   s ɔ ŋ          s ɔ ŋ   n a a
 |\..    |              |      /|
 L  H    H              H   H  L
```

TR 3

```
         ----------     s ɔ ŋ   n a a
                         |      /|\ ≠
                         H   H  L
```

Downstep

```
ŋ u ŋ   s ɔ ŋ          s ɔ ŋ   n a a
 |\      |              |       | |\
 L  H    D              H       D L
```

Output: ŋù ŋ́ s!ɔ́ ŋ s ɔ́ ŋ n!áà

7. Conclusion

In the above discussion, we have tried to outline the rules governing the associative construction in Nchufie. We have focussed on tone changes that are of a general nature. We have seen that the tones of the nouns, the syllable structure of NP_2 are crucial factors as to the sort of tone changes that take place.

We have also argued that the noun class membership of N_1 does not determine the associative tone in Nchufie, contrary to what has often been claimed for other closely related languages of the same family. We see the breakdown of the noun class system in Nchufie as the most likely reason why the nature of the associative marker is not determined by the noun class membership. Instead we have argued that the associative tone in Nchufie is invariably a High tone for all noun classes.

REFERENCES

Andersen, H. 1973. 'Abductive and deductive change.' *Language* 49: 765-793.

Anttila, R. 1989. *Historical and Comparative Linguistics*. CILT 6. Amsterdam: John Benjamins Publishing Co.

Asongwed, T. and L. Hyman. 1976. 'Morphotonology of the Ngamambo Noun.' *Southern California Occasional papers in Linguistics, (SCOPIL) 3.* Los Angeles: USC.

Carstens, V. 1991. *The Morphology and Syntax of Determiner Phrases in Kiswahili.* Doctoral Dissertation. UCLA.

Hombert, J-M. 1976. 'Noun Classes and Tone in Ngie' *Southern California Occasional Papers in Linguistics, (SCOPIL) 3.* Los Angeles: USC.

Hyman, L. 1979. *Aghem Grammatical Structure.* SCOPIL 7. Los Angeles: USC.

Leroy, J. 1977. *Morphologie et Nominales en Mankon.* Paris: SELAF.

Nkemnji, M. 1993. 'The Structure of Noun Phrases in Nweh' ms. UCLA.

Schaub, W. 1985. *Babungo.* London: Croom Helm.

NEGATION IN NCHUFIE

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0. Introduction

This paper describes different types of negation in Nchufie, investigating the interaction between negation and modality (sentence types and moods). Further, examining a variety of negative contexts, it proposes a functional characterization of the second negative marker *pə* in Nchufie whose occurrence is conditioned by the modality of the sentence.

1. Negation and Sentence Types

First we illustrate three different patterns of negation which occur in different sentence types: declaratives, interrogatives, and imperatives.

1.1. Declaratives - [ka verb... pə]

In declarative sentences, we have a 'basic' type of negation marked by two elements, the preverbal *ka* and the clause final *pə*. For ease of reference, I will use Neg-1 and Neg-2 for the preverbal marker and the clause final marker, respectively. Now consider the following:

(1) ɑ zɛ
he smart
'He is smart.'

(2) ɑ kɑ zɛ pə
he NEG smart NEG
'He is not smart.'

(3) pɩɩncu kwɛ kɛɛŋɔ
P. like K.
'Piinchu likes Keengo.'

(4) n n-ji njɩɛ̨ pɩɩncu kɑ kwɛ kɛɛŋɔ pə
I N-know that P. NEG like K. NEG
'I know that Piinchu does not like Keengo.'

The negated sentences in (2) and (4) contain both Neg-1 and Neg-2. If a clause has more than one verbal element, as in (5) below, Neg-1 shows up before the first verb. Thus in (6), Neg-1 comes before the auxiliary verb *lɛɩ*.

(5) n n-dɛɩ n-dɩɛ
I N-want N-sleep
'I want to sleep.'"

(6) ŋ kɑ lɛɩ n-dɩɛ pə
I NEG want N-sleep NEG
'I do not want to sleep.'

Let us consider sentences with a predicate nominal. As shown in the following, such sentences do not allow a copula verb in the present tense, whereas the copula verb *pə* has to occur in the past tense.

(7) ɑ (*mbə) sɔŋ wə
he Cop friend my
'He is my friend.'

(8) ɑɑ *(mbə) sɔŋ wə
he Past-Cop friend my
'He was my friend.'

The absence of *mbə* in the present tense seems to trigger the absence of Neg-1 in negative sentences. Thus, we do not have *kɑ* in (9) below.

(9) ɑ sɔŋ wə pə
he friend my not
'He is not my friend.'

(10) ɑɑ ŋkɑ pə sɔŋ wə pə
he Past-N-NEG COP friend my NEG
'He was not my friend.'

*1.2. Interrogatives - [kɑ verb... *pə]*

Interrogative sentences reveal another type of negation where Neg-2 is missing. For example,

(11) poo n-dɩɛ-ɛ
they N-sleep-Q
'Did they sleep?'

(12) poo ŋ-kɑ lɩɛ-ɛ *pə
they N-NEG sleep-Q NEG
'Didn't they sleep?'

(13) pɩɩncu kwɛ wə
P. like who
'who does Piinchu like?'

(14) pɩɩncu kɑ kwɛ wə *pə
P. NEG like who NEG
'who doesn't Piinchu like?'

(12) is a yes/no question, which is marked by lengthening of the last vowel of the sentence. (14) is a wh-question containing a wh-phrase *wə* 'who'. Neither (12) nor (14) allows

Neg-2 to occur. This is true of embedded wh-questions, as shown in the following.

(15) ɔ kwąą njɩɛ̰ ɑ kwɛ wə ŋ-kwɛ kɛɛŋɔ
you think that it like who N-like K.
'who do you think likes Keengo?'

(16) ɔ kwąą njɩɛ̰ ɑ ka kwɛ wə ŋ-kwɛ kɛɛŋɔ̃ *pə
you think that it NEG like who N-like K. NEG
'who do you think does not like Keengo?'

*1.3. Imperatives - [ki N-verb... *pə]*

Finally, let us consider imperative sentences including the hortative sentence type.

(17) ɣəɯ
'go!'

(18) (ɔ) ki ŋ-gəɯ ndɨgɛ *pə
you NEG N-go home NEG
'Don't go home.'

(19) pɩɛ ɣəɯ
we go
'let's go.'

(20) pɩɛ ki ɱ-fɩɛ̰ ŋ-gəɯ *pə
we NEG N-early N-go NEG
'Let's not leave early.'

As shown in (18) and (20), negative imperative sentences do not use *ka* but a different Neg-1 form, *ki*. Again, as in interrogatives, Neg-2 is not available in imperatives, either. Since there is no person/number agreement on the verbal inflection, the subject *pɩɛ* 'we' in (20) is obligatory, while the 2nd person sg. *ɔ* is optional in (18). Imperatives, marked by the subjunctive mood, will be discussed in the following section.

2. Negation and Moods -- Indicative vs. Subjunctive

Nchufie distinguishes two grammatical moods by assigning different tonal patterns on verbs. Notice the different tones on the embedded verbs in (21a) and (21b): *ɣəɯ* in (21a) but *ɣəɯ* in (21b).

(21) a. kɛɛŋɔ cu njɩɛ̰ pɩɩncu ɣəɯ ndɨgɛ
K. say that P. go home
'Keengo said that Piinchu goes home.'

b. nkɛɛŋɔ n-cu njɩɛ̰ pɩɩncu ɣəɯ ndɨgɛ
K. Past-N-say that P. go home
'Keengo said that Piinchu should go home.'

We are not quite clear on the tonal patterns of the two grammatical moods, but the tonal difference is consistently identified in embedded clauses. We show one pair of sentences

which reveals the tonal difference in matrix clause: *kwɛ* 'like' is assigned LH-tones (a rising tone of Low-High) in (22a) but H-tone (a High tone) in (22b).

(22) a. pɩɩncu kwɛ kɛɛŋɔ
P. like K.
'Piinchu likes Keengo.'

b. fəkə pɩɩncu kwɛ kɛɛŋɔ
hopefully P. like K.
'Hopefully, Piinchu likes Keengo.'

We take the tonal patterns on the verbs in (21a) and (22a) as markers of the indicative mood and those in (21b) and (22b) as markers of the subjunctive mood. In the following sections, 2.1 and 2.2, we illustrate various contexts where we get different negation types in the indicative and subjunctive moods.

2.1. Indicative - [ka verb... pə]

The negation type we get in indicative sentences is the basic type containing both *ka* and *pə*. Neither Neg-1 nor Neg-2 may delete in the indicative mood. The following illustrate this point for complement clauses of 'think', 'know', and 'hear'.

(23) ŋ kwɑ̰ɑ̰ njɩɛ̰ pɩɩncu ka kwɛ-ɛ pə
I think that P. NEG like-her NEG
'I **think** that Piinchu does not like her.'

(24) n ji njɩɛ̰ pɩɩncu ka kwɛ kɛɛŋɔ pə
I know that P. NEG like K. NEG
'I **know** that Piinchu does not like Keengo.'

(25) ɑɑ n-jo̰o̰ njɩɛ̰ mɑɑ ŋ-gəɯ ndɨgɛ
he Past-N-hear that I N-go home
'He **heard** that I went home.'

(26) mɑɑ n-jo̰o̰ mɯlɑɑ njɩɛ̰ pɩɩncu ŋ-kɑ zɑɑ ŋwɛ̰ɛ̰ pə
I Past-N-hear rumor that P. N-NEG steal book NEG
'I **heard** the rumor that Piinchu did not steal the book.'"

2.2. Subjunctive

There are three types of negation in subjunctive clauses, which make use of different Neg-1 markers, i.e., *ki, mi,* and *na.* Each of them is chosen by the specific modality of the negated proposition. Here we name those modalities 'deontic', 'epistemic', and 'conditional', though we have not yet identified what grammatical devices realize the modalities distinctively.

2.2.1. Deontic - [*ki* N-verb... **pə*]

This type of negation is recognized in complement clauses of 'say', 'think', 'want', and 'make', which take the subjunctive mood. These embedded propositions convey deontic modality that marks the commitment of the speaker to the necessity or obligation of the propositions. *ki* shows up as a Neg-1 marker in these contexts, and Neg-2 is missing as in the imperative sentences.

The verb *cu* 'say' and *kwa̰* 'think' can take complement clauses either in the indicative mood, (27a), or in the subjunctive mood, (27b). We can see the tonal difference between the indicative and the subjunctive clauses: e.g., *ɣəɯ* 'to go' takes a LH-tone in (27a), but a H-tone in (27b).

(27) a. kɛɛŋɔ cu njɩɛ̰ pɩɩncu ɣəɯ ndɨgɛ
K. say that P. go home
'Keengo said that Piinchu goes home.'

b. pɩɩncu n-cu njɩɛ̰ po ɣəɯ ndɨgɛ
P. Past-N-say that they go home
'Piinchu said that they should go home.'

c. pɩɩncu n-cu mbwɔ kɛɛŋɔ njɩɛ̰ ndɛ/po ki ŋ-gəɯ ndɨgɛ *pə
P. Past-N-say to K. that Nde/they NEG N-go home NEG
'Piinchu said to Keengo that Nde/they should not go home.'

(28) a. pɩɩncu kwa̰ njɩɛ̰ kɛɛŋɔ ɣəɯ ndɨgɛ
P. think that K. go home
'Piinchu thinks that Keengo should go home.'

b. pɩɩncu kwa̰ njɩɛ̰ kɛɛŋɔ ki/*mi ŋ-gəɯ ndɨgɛ *pə
P. think that K. NEG/NEG N-go home NEG
'Piinchu thinks that Keengo should not go home.'

The verbs *lɛɩ* 'want' and *cuɛ* 'make' in Nchufie take only subjunctive clauses, realized by particular tonal patterns on the verbs in the following.

(29) a. pɩɩncu lɛɩ (njɩɛ̰) kɛɛŋɔ lɩɛ
P. want (that) K. sleep
'Piinchu wants that Keengo should sleep.'

b. pɩɩncu lɛɩ (njɩɛ̰) kɛɛŋɔ ɣəɯ ndɨgɛ
P. want (that) K. go home
'Piinchu wants Keengo to go home.'

c. pɩɩncu lɛɩ njɩɛ̰ po ki n-dɩɛ *pə
P want Comp. they NEG N-sleep NEG
'Piinchu wants that they should not sleep'

d. n dɛɩ njɩɛ̰ pɩɩncu ki ŋ-kwɛ-ɛ *pə
I want that P. NEG N-like-her NEG
'I want that Piinchu should not like her.'

(30) a. maa n-cuɛ a: ɣəɯ
I Past-N-make he go
'I made him go.'

b. maa n-cuɛ nji̯ɛ̰ a ki ŋ-gəɯ ndɨgɛ *pə
I Past-N-make that he NEG N-go home NEG
'I made that he should not go home.'

2.2.2. Epistemic - [*mi* N-verb... (*pə*)]

This section notes another type of negation with *mi* (Neg-1). This type goes with sentence-initial adverbials which convey epistemic or expressive modality. The term 'epistemic' is meant to include both the speaker's epistemic evaluation and his feelings towards the proposition. Thus, the modalities traditionally called 'volitive', 'boulomatic', and 'optative' are covered under the term.

First we consider examples with sentence-initial adverbials *mbə* 'possibly' in (31), *səɯ ndə* 'maybe'(literally 'some time') in (32), and *fəkə* 'hopefully' in (33). These adverbials can lead only subjunctive clauses. Thus we have:

(31) a. pɩɩncu kwɛ kɛɛŋɔ
P. like K.
'Piinchu likes Keengo.'

b. mbə pɩɩncu kwɛ kɛɛŋɔ
possibly P. like K.
'Possibly, Piinchu might like Keengo.'

c. mbə pɩɩncu mi/*ki ŋ-kwɛ kɛɛŋɔ (pə)[1]
possible P. NEG/NEG N-like K. NEG
'Possibly, Piinchu might not like Keengo.'

(32) a. səɯ ndə pɩɩncu kwɛ kɛɛŋɔ
maybe P. like K.
'Maybe, Piinchu likes Keengo.'

b. səɯ ndə pɩɩncu mi/*ki ŋ-kwɛ kɛɛŋɔ (pə)
some time P. NEG/NEG N-like K. NEG
'Maybe, Piinchu does not like Keengo.'

(33) a. fəkə pɩɩncu kwɛ kɛɛŋɔ
hopefully P. like K.
'I wish Piinchu likes Keengo.'

b. fəkə a ɣəɯ
hopefully he go
'I wish he should go.'

[1] The deletion of *pə* (Neg-2) does not seem to be free because the consultant says sentences sound incomplete without it, but very often her first response to such sentences lacked *pə*.

c. fəkə ɑ mi/*ki ŋ-gəɯ (pə)
hopefully he NEG N-go NEG
'I wish he should not go.'

Notice that *ki* is not allowed in these contexts as shown in (31c), (32b), and (33c), and that the tones on the verbs are the tones associated with the subjunctive mood. Now let us consider the embedded contexts where a negated clause shows up and *mi* occurs in the Neg-1 position. These embedded clauses are lead by matrix verbs like *kwe* 'help' (as in (34)) or *cuo mbua* 'be afraid' (as in (35)).

(34) a. mbɔ̰mbi kwe pɩɩncu kwɛ kɛɛŋɔ
God help P. like K.
'Fortunately, Piinchu likes Keengo.'

b. mbɔ̰mbi kwɛ ɑ tuɔ
God help he come
'Fortunately, he comes.'

c. mbɔ̰mbi kwɛ mbgə mi/*ki n-duɔ (pə)
God help rain NEG N-fall NEG
'Fortunately, rain has not fallen.'

(35) a. n cuo-mbuɑ ŋjɩɛ̰ səɯ-ndə pɩncu kwɛ kɛɛŋɔ
I be.afraid that **maybe** P. like K.
'I am afraid that Piinchu may like Keengo.'

b. n cuo-mbuɑ ŋjɩɛ̰ səɯ-ndə pɩncu mi/*ki ŋ-kwɛ kɛɛŋɔ pə
I be.afraid that **maybe** P. NEG/NEG N-like K. NEG
'I am afraid that Piinchu may not like Keengo.'

2.2.3. Conditional - [*na* N-verb... **pə*]

Conditional sentences take another negation type which uses *na* in the Neg-1 position and an empty Neg-2. In conditional sentences, both the subordinate (*if*-) clause and the main clause are non-factual. Neither indicates that an event has occurred (or is occurring or will occur), but the sentence merely indicates the dependence of the truth of one proposition upon the truth of the other.

Nchufie assigns another tonal pattern for the conditional clauses. Consider the paradigm given in (36a-d).

(36) a. ɑɑ n-jɛ, mbə mɑɑ ŋ-kwɛ-ɛ[2]
he N-smart then I Fut-N-like-him
'If he is smart, I would like him.'

2 The high tone on the pronoun *aa* 'he' seems higher than the normal high-tone in (36b), but it is not quite certain that it is super-high.

b. aa n-jɛ
he N-smart
'he will be smart.'

c. aa n-jɛ
he N-smart
'he was smart.'

d. a zɛ
he smart
'he is smart.'

The conditional clause in (36a) carries a different tonal pattern from the other tensed clauses. Notice that the verb in (36a) carries a high-tone and is prefixed with a nasal which goes with past or future tense. This N-prefix suggests that the conditional (mood) is marked by a complex pattern which involves both a tense (past or future) marker and a subjunctive mood marker. Now let us consider negation in conditionals.

(37) a na/*ka/*ki n-jɛ *pə, mbə ma ka ŋ-kwɛ-ɛ pə
he NEG N-smart NEG then I NEG N-like-him NEG
'If he is not smart, I would not like him.'

(38) a. pɩncu ŋ-kwɛ kɛɛŋɔ, mbə maa ŋ-kwɛ-ɛ mbi
P. N-like K. then I N-like-him also
'If Piinchu likes Keengo, I would like her(K.) too.'

(39) b. pɩncu na/*ka/*ki ŋ-kwɛ kɛɛŋɔ, mbə ma ka ŋ-kwɛ-ɛ mbi pə
P. NEG N-like K. then I NEG N-like-him also NEG
'If Piinchu does not like Keengo, I would not like her(K.) either.'

(40) a. pɩncu ŋ-gəɯ ndɨgɛ, mbə kɛɛŋɔ ŋ-kwɛ-ɛ
P. N-go home then K. N-like-him
'If Piinchu goes home, Keengo would like him(P.).'

b. pɩncu na/*ka/*ki ŋ-gəɯ ndɨgɛ, mbə kɛɛŋɔ ŋ-kwɛ-ɛ
P. NEG N-go home then K. N-like-him
'If Piinchu does not go home, Keengo would like him(P.).'

Conditionals simply do not allow other Neg-1 markers (e.g., *ka*, *ki*, or *mi*), and Neg-2 does not show up. The consequent clauses seem to take future tense only with an N-prefixed verb.

3. Negation and Irrealis

Now we characterize the environments where Neg-2 shows up. The Neg-2 marker (*pə*) can only show up overtly in sentences negated with Neg-1. This is why the second negation markers in many Bantu languages are dealt with as pure negation markers. The data we considered so far reveal, however, that this is not true for Nchufie, since *pə* never occurs in other sentence types than declaratives and indicatives.

Further, the location of Neg-2 is severely restricted to the clause-final position. Thus the following are ungrammatical.

(41) a. *pɩɩncu ŋ-kɑ n-cu mbwɔ kɛɛŋɔ pə njɩɛ̰ ɑ ɣəɯ ndgɛ
P. Past-N-NEG N-say to K. NEG that he go home
'Piinchu did not say to Keengo that he should go home.'"

b. *pɩɩncu ŋ-kɑ n-cu pə mbwɔ kɛɛŋɔ njɩɛ̰ ɑ ɣəɯ ndgɛ
P. Past-N-NEG N-say NEG to K. that he go home
'Piinchu did not say to Keengo that he should go home.'"

When both the matrix and the embedded clauses are negated, Neg-2 does not occur twice at the end of the sentence.

(42) pɩɩncu ŋ-kɑ cu njɩɛ̰ ɑɑ ŋ-kɑ ɣəɯ ndɨgɛ pə (*pə)
P. Past-N-NEG say that he N-NEG go home NEG NEG
'Piinchu did not say that he didn't go home.'

Neither does it show up before a sentential adverb like *zuŋ* 'yesterday' as shown in the following.

(43) a. mɑɑ ŋ-kɑ ɣəɯ ndɨgɛ zuŋ pə
I Past-N-NEG go home yesterday NEG
'I did not go home yesterday.'

b. *mɑɑ ŋ-kɑ ɣəɯ ndɨgɛ pə zuŋ
I Past-N-NEG go home NEG yesterday
'I did not go home yesterday.'

This clearly tells us that the position of *pə* is at a position high enough to take scope over the proposition it goes with.These facts suggest that Neg-2 is linked to the speaker's evaluation of a proposition. Then how does it contribute to the meaning of speaker's modality? We saw in the preceding sections that *pə* does not occur in imperatives, interrogatives, or in subjunctive contexts including conditionals. None of these contexts involve speaker's commitment to the truth of the proposition. Thus we can dub the environment where *pə* does not occur as the *irrealis* context. Now it is clear how to characterize the function of *pə*: it is the *realis* marker in negative sentences. In other words, *pə* indicates that the speaker commits himself to the truth of the proposition, even though the sentence is negated.

Finally, let me give one piece of data which supports this characterization of Neg-2 in Nchufie. Nchufie has an auxiliary to express the habitual aspect: see *taa* in the following.

(44) ɑɑ n-taa n-nɔ ndipɩɛ pə
he N-Habitual N-smoke cigarette NEG
'He never smokes.'

Notice that this sentence does not have Neg-1 but necessarily *pə* (Neg-2). Clearly

enough, habitual aspect involves *realis* modality, which implies that *pə* in (44) may not be omitted. The occurrence of *pə* in such a *realis* context can be identified in the following where *kaa* (Perfective auxiliary) appears before the verb. Again, Neg-2 is essential in the negated sentence (45b).

(45) a. ɑ **kaa** tuŋ wuu̯
he Perf. kick us
'He has kicked us.'

b. fɪɑ zɛ ɑ **kaa** n-nɔ ndipɪɛ pə
since him he Perf. N-smoke cigarette NEG
'He has never smoked.'

4. Concluding Remarks and Remaining Problems

This paper has described different types of negation in Nchufie with respect to sentence types and grammatical moods. These two kinds of factors can be laid out in unified terms: that is, we speculate that *ka* only occurs in indicative mood, and the other types (*ki, mi,* and *na*) in subjunctive mood. The project we are dealing with in this paper, however, requires many issues to be settled.

First of all, we ignored the Nasal-prefixation on the verbs which follow Neg-1: *ka* takes bare verb forms, whereas the other types(*ki, mi,* and *na*) take the N-prefixed verb forms. This suggests that the Neg-1 markers in the subjunctive mood(*ki, mi,* and *na*) are more like a lexical auxiliary verb than *ka* is in the indicative mood. Secondly, we have not identified any formal marking which distinguishes deontic modality from the epistemic one. Thirdly, we did not give an account of the optional occurrence of *pə* discussed in section 2.2.2.

Finally, we have not quite paid attention to the negation in relative clauses. The data we have got so far do not allow any types of negation other than *ka*, and Neg-2 hardly appears in relative clauses. Thus:

(46) a. pɪɪncu n-jəɯ mɛ-mbɛɛ̰ ɑ ya kɛɛŋɔ ŋ-kwɛ *(lɑ)
P. Past-N-see child-man Comp K. N-like Def.
'Piinchu saw the child who Keengo liked.'

b. pɪɪncu n-jəɯ mɛ-mbɛɛ̰ ɑ ya kɛɛŋɔ ŋ-kɑ kwɛ *(lɑ)
P. Past-N-see child-man Comp K. N-NEG like Def.
'Piinchu saw the child who Keengo did not like.'

(47) sɔŋ ya aa n-ta ɱ-faa̰ (**pə**) la, bii[3] ŋ-gəɯ
friend Comp he N-Habt. N-work NEG def. R.Past N-go
'The friend who does not work went.'

Why does *pə* not occur in relative clauses? Why are the other Neg-1 markers not available? We do not have clear answers to these questions at the moment.

[3] Nchufie has two different past tenses: one is remote past and the other is recent past. The former is marked by tones, whereas the latter is marked by a preverbal auxiliary *bii* which is glossed with 'R.Past' in the paper. This recent past tense is used when the event the sentence is describing has happened in the same day of the speech time.

THE FACTS OF NCHUFIE DP'S: A REPORT

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0. Introduction

This report focuses on some properties of DPs in Nchufie. I have investigated the structure of Nchufie DPs in order to test the hypotheses made in Kural and Moritz (this volume) with respect to the locality constraints on WH movement in Nchufie. There it had been found that, quite surprisingly given the literature on WH in situ languages, Nchufie WH in situ is very rarely allowed in contexts where its extraction at LF would lead to a typical Subjacency violation. Kural and Moritz hypothesized that LF movement obeys the same constraints as S-Structure movement. They adopted a theory of movement inspired by Sportiche (1990) in which movement is a local process which is sensitive to the availability of Specifiers as escape hatches. It is the unavailability of free Specifiers between the extraction site and the Specifier of CP, they claimed, which causes the ungrammaticality of questions when the WH word is embedded inside a domain known to constitute an Island for movement. If Kural and Moritz are correct, one would expect similar restrictions to occur when one tries to extract out of simple nominal expression. This is the background underlying the study that I have undertaken over the last weeks.

Most of the time with our consultant, Sophie Ajeakwa, has been spent trying to obtain data which pertains to the structure of Nchufie DPs. I have only been able to start looking at extraction very recently. The results are not telling at this point as much more work needs to be done. Therefore, this report will be organized as follows: in section 1, we will look at the distribution of element inside nominal expressions and give a couple of generalizations regarding the word order inside DPs in Nchufie. In section 2, we will first look at facts of agreement inside DPs (section 2.1), and then propose a tentative structure for Nchufie DPs together with a specific mechanic deriving the observable word order (section 2.2). Finally, in section 3, we will look at the preliminary results of WH questions where the WH word is embedded inside a DP. This will lead us to list the types of data that still need to be examined.

1. Word Order and Distribution of Lexical Elements inside DPs

Class and individual elicitations in the Fall and Winter 1991-92 had given us some data on Nchufie DPs. However, many holes remained to be filled. Therefore, I went back to the basics.

1.1. Head Nouns

Head nouns precede most of the lexical elements in the DP. They precede the categories listed in sections 1.1.1 through 1.1.9, and follow those listed in sections 1.1.10 through 1.1.13:

1.1.1. Specific Determiners

Head nouns precede specific determiners, irrespective of the number of the head noun, see (1), (2), (5), (6) as opposed to (3), (4), (7), (8), the type of determiner in question, see (1), (3), (5), (7) as opposed to (2), (4), (6), (8), and the class of the head noun, see (1) through (4) as opposed to (5) through (8): [1]

(1) mɛ́ ɑ̂
child the
'The child (specific)'

(2) mɛ́ səɯ̀
child the
'The child (specific)'

(3) pɑ̃ı́ pà
child the
'The children (specific)'

(4) pɑ̃ı́ pɔ̀
children the
'The children (specific)'

(5) tɯ́ ɑ̀
tree the
'The tree (specific)'

(6) mɯ̀tɯ́ səɯ̀
tree the
'The tree (specific)'

(7) mɯ̀tɯ́ mà
trees the
'The trees (specific)'

[1]Actually, class and number do not make any difference with respect to word order except in one particular case with adjectives.

(8) mɯ̀tɯ́ mɔ̀
trees the
'The trees (specific)'

1.1.2. Demonstrative Pronouns

Head nouns precede demonstrative pronouns.

(9) mɛ́ lɔ̀/ɔ̀ lɔ̀/ɔ́ wì/í
child happy this
'This happy child'

(10) mɯ̀tɯ́ lɛ̃́/ɛ̃̀ lɛ̃́/ɛ̃̀ mì/í
trees large these
'These large trees' [2]

1.1.3. Possessive DPs and Pronouns

Head nouns precede possessive DPs (11) and (12) as well as pronouns (13) and (14).

(11) miŋ̂ pìíncū
child P.
'Child of Pinchu'

(12) mɯ̀tɯ́ pìíncū
trees P.
'Trees of Pinchu'

(13) tɯ́ è wâ
tree his the
'The his tree' [3]

(14) mɯ̀tɯ́ mé mɔ̀
trees his the
'The his trees'

1.1.4. Adjectives

Head nouns precede adjectives.[4]

(15) mɛ́ lɔ̀/ɔ̀ lɔ̀/ɔ́
child happy
'Happy child'

---

[2]We have had a number of examples in the Fall and Winter in which the demonstrative followed the head noun without any other word present in the DP. I am not giving such examples simply for my convenience, as I do not wish, when possible, to rewrite examples. In the simple cases, the order is N-Demonstrative.

[3]In the simple cases, the order is N-Poss pronoun.

[4]The question of the reduplication of the adjectival root, a process which seems obligatory for animate head nouns and optional for inanimate head nouns, is studied by Silverman (this volume).

(16) mɯ̀tɯ́ lɛ̃́/ɛ̃̀ (lɛ̃́/ɛ̃̀)
trees large
'Large trees'

1.1.5. DP Complements

Head nouns precede DP complements.

(17) ɔ̀ɔ́ njəɯ̄ fótò kɛɛ́ŋɔ̀ yì/í
you+SH saw picture K. this
'You saw this picture of Kengo (theme or theta-possessor)' [5]

1.1.6. Non-Theta Possessors

Head nouns precede non-theta possessors.[6]

(18) fótò kɛɛ́ŋɔ̀ mbùɔ́ pìí́ncū
picture K. to P.
'Pinchu's (non theta poss) picture of Kengo (theme/theta-poss)'

1.1.7. PP Adjuncts

Head nouns precede PP adjuncts.

(19) tɯ́ yì/í kɛ̀ mùfùɔ́
tree this without leaves
'This tree without leaves'

(20) mɛ́ sə̀ɯ́ kɛ̀ má
child the without mother
'The (spec) child without a mother'

1.1.8. Relative Clauses

Head nouns precede relative clauses.

(21) mɛ́ ɑ̂ pìí́ncū njə̀ɯ̄
child Op P. saw
'The child who Pinchu saw'

(22) mɯ̀tɯ́ mɑ pìí́ncū ŋkɔ̀ɔ̰
trees Op P cut
'The trees that Pinchu cut'

---

[5]I use the concept 'theta-possessor' to refer to the possessor in the linguistic sense, as opposed to possessor in a non-technical way. For example, if am the unlawful possessor of a picture belonging to Pinchu, then Pinchu is the 'theta-posessor' and I am the 'non-theta-possessor'. This distinction will become relevant in Section 3.

[6]These non-theta possessor DPs are a problem; they are probably adjuncts however.

1.1.9. Adjectival Quantifiers

Head nouns precede adjectival quantifiers.[7]

(23) pɑ̃ˆ zɛ̃ˆzɛ̃ˆ
children many
'Many children'

(24) pɑ̃ˆ pɔ̌ zɛ̃ˆ
children the many
'The children are many'

(25) mɯ̀tɯ́ zɛ̃ˆzɛ̃ˆ
trees many
'Many trees'

(26) mɯ̀tɯ́ zɛ̃ˆzɛ̃ˆ
trees many
'The trees are many'

1.1.10. Quantifiers

Head nouns follow quantifiers.

(27) zɛ̃ˆ pɑ̃ˆ
many children
'Many children'

(28) zɛ̃ˆ mɯ̀tɯ́
many trees
'Many trees'

(29) ŋkǎ pɑ̃ˆ
all children
'All the children'

(30) ŋkǎ mɯ̀tɯ́ mì/í
all trees these
'All of these trees'

1.1.11. Indefinite Quantifiers

Head nouns follow indefinite quantifiers.

(31) səɯ̀ mɛ́ kɛ́ mà
some child without mother
'Some child without a mother'

(32) pùsəɯ́ pɑ̃ˆ´ kɛ́ mà
some children without mother
'Some children without a mother'

---

[7]Examples (24) and (26) illustrate the fact that this quantifier can also work like a predicative adjective.

(33) pùsəɯ́ mɯ́tɯ̀ kɛ̀ mùfùɔ́
some trees without leaves
'Some trees without leaves'

1.1.12. Numerals

Head nouns follow numerals.

(34) tìí pɑ̂ì pìí ncū
three children P.
'Three children of Pinchu'

(35) tìí mɯ̀tɯ́ pìí ncū
three trees P.
'Three trees of Pinchu'

1.1.13. Some Adjectives

Head nouns follow some adjectives.

(36) mbùgɔ̀ ŋgɔ̃̀
pretty man
'Beautiful noble man'

Given what we have seen of the distribution of head nouns in Nchufie DPs, we can state the following **generalization**:

(37) Head nouns precede most of the DP material expect for quantifier-type elements and a restricted class of adjectives.

1.2. Specific Determiners and Demonstratives

Specific determiners and demonstratives have a complementary distribution in DPs: they cannot cooccur. They appear after the head noun (see sections 1.1.1 and 1.1.2 above). They also follow the items in sections 1.2.1 through 1.2.3, and precede those in 1.2.4 through 1.2.6:

1.2.1. Theta-Possessive DPs and Pronouns

Specific determiners and demonstratives follow theta-possessive DPs, (38) through (41), and pronouns, (42) and (13).

(38) mí ŋ pìí ncū wì/í
child P. this
'This child of Pinchu'

(39) tɯ́ pìí ncū yì/í
tree P. this
'This tree of Pinchu'

(40) mí ŋ pìí ncū â / səɯ̀
child P. the the
'The (specific) child of Pinchu'

(41) tɯ́ pìí ncū â / səɯ̀
tree P. the the
'The (specific) tree of Pinchu'

(42) pɑ̂í´ pé pɔ̀
children his the
'The his children'

(13) tɯ́ è wâ
tree his the
'The his tree'

1.2.2. Adjectives

Specific determiners and demonstratives follow adjectives, either postnominal, (9), (10), (43), (44), or prenominal (45):

(9) mɛ́ lɔ̀/ɔ̀ lɔ̀/ɔ́ wì/í
child happy this
'This happy child'

(10) mɯ̀tɯ́ lɛ̃´/ɛ̃` lɛ̃´/ɛ̃` mì/í
trees large these
'These large trees'

(43) mɛ́ lɔ̀/ɔ̀ lɔ̀/ɔ́ â
child happy the
'The (spec) happy child'

(44) mɯ̀tɯ́ lɛ̃´/ɛ̃` (lɛ̃´/ɛ̃`) mɔ
trees large the
'The (spec) large trees'

(45) mbùgɔ̀ ŋgɔ̃` â / səɯ̆
pretty man the / the

1.2.3. DP Complements

Specific determiners and demonstratives follow DP complements.[8]

(17) ɔ̀ɔ́ njəɯ̀ fótò kɛɛ́ŋɔ̀ yì/í
you+SH[9] saw picture K. this
'You saw this picture of Kengo'

(46) *ɔ̀ɔ́ njəɯ̀ fótò wə̃́ yì/í / â / səɯ̀
you+SH saw picture who this / the / the
'You saw this / the (specific) picture of who'

---

[8]For (45) and (46), the word order reflects the word order in the corresponding grammatical statements.

[9]SH is the symbol for the Super High tone found with the Past tense. For an explanation of the workings of tense in Nchufie, see Ben-Shalom (this volume).

(47) *ɔ̀ɔ́ njəɯ̂ tɯ́ wə́ yì/í / â / səɯ̀
you+SH saw tree who this / the / the
'You saw this / the (specific) tree of who'

One expects specific determiners and demonstratives to follow whatever precedes the head noun, given that they follow the head noun themselves. Here my data has a number of holes; however, the prediction is verified with the quantifier *ŋkǎ*, 'all' in (47) and (30), and with prenominal adjectives, as in (53):

(48) ŋkǎ pɑ́ɪ̂ pɔ̌ / pâ
all children the / the
'All of the children'

(30) ŋkǎ mɯ̀tɯ́ mì/í
all trees these
'All of these trees'

(49) mbùgɔ̀ pɯ̀ŋ pì/í
pretty men these
'These noble men'

1.2.5. Non-Theta Possessors

Specific determiners and demonstratives precede non-theta possessors.

(50) fótò yì/í mbuɔ̌ pìí́ncū
picture this with P.
'This picture in possession of Pinchu'

(51) fótò səɯ̌ / â mbuɔ̌ pìí́ncū
picture the / the with P.
'The (spec) picture in possession of Pinchu'

This distribution of the non-theta possessor with respect to specific determiners and demonstratives suggests strongly, given the facts directly underneath, that the non-theta possessor sits in an adjunct position in the DP. We will return to this possessor in section 3 below.

1.2.5. PP Adjuncts

Specific determiners and demonstratives precede PP adjuncts.

(52) pɑ́ɪ́ pì/í kɛ̀ má
children these without mother
'These children without a mother'

(19) tɯ́ yì/í kɛ̀ mùfùɔ́
tree this without leaves
'This tree without leaves'

1.2.6. Relative Clauses

Specific determiners and demonstratives precede relative clauses.[10]

(53) mɛ́ wì / ɑ̂ pìíncū ŋjə̀ɯ̄
child this Op P. saw
'This child which Pinchu saw'

(54) mɯ̀tɯ́ mì/i mɑ́ pìíncū ŋkɔɔ
trees these Op P saw
'These trees which Pinchu cut'

We have now established that specific determiners and demonstratives precede all adjuncts. Thus, the following **generalization** obtains with respect to their distribution:

(55) Specific determiners and demonstratives have a complementary distribution in DPs and they occur in the final position of the DP, followed only by adjunct type material.

1.3. Possessive Pronouns and Theta-Possessive DPs

Possessive pronouns and theta-possessive DPs are in complementary distribution. As we have already seen, they follow the head noun and precede the specific determiners and demonstratives. Let us note here too that possessives are in complementary distribution with theme arguments in the restricted set of head nouns that allow for a complement other than a mere possessive. The situation is summarized in (56):[11]

(56) a. fótò kɛɛ́ŋɔ̀ mbuǒ pìíncū
photo K. of P.
owner non-theta possessor
'Pinchu's picture that belongs to Kengo'

b. fótò kɛɛ́ŋɔ̀ ɑ́ yɑ̀ sòfí ŋɔ̀ lɑ́
Op that S. on it
owner theme
'Kengo's picture of Sophie'

c. * fótò kɛɛ́ŋɔ̀ pìíncū
* owner theme
* theme owner

From a distributional point of view, therefore, what we say of the theta possessors is valid for the theme arguments as well.

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[10]Because of the particular properties of the relative clause construction in Nchufie, one cannot test if it follows a specific determiner. This is so because, what I believe to be the overt relative clause operator looks very similar to the specific determiner.

[11]The grammatical function of each predicate is underlined directly underneath it. 'Owner' means the person who has legal title to the picture. 'Non-theta possessor' means the person who happens to be holding the picture.

The next distributional property of possessives is that they follow adjectives and quantifiers, but precede adjunct PPs and relative clauses:

1.3.1. Adjectives

Possessives follow adjectives, either prenominal, (57) and (58), or postnominal, (59) through (62).

(57) mbùgɔ̀ mîŋ pìíncū
pretty child P.
'Noble child of Pinchu'

(58) mbùgɔ̀ ndɔ́ŋ ê
pretty husband her
'Her noble husband'

(59) mɛ́ lɔ̀/ɔ̀ lɔ̀/ɔ́ pìíncū
child happy P.
'Happy child of Pinchu'

(60) tɯ́ lɛ̃́/ɛ̃̀ lɛ̃́/ɛ̃̀ pìíncū
tree large P.
'Large tree of Pinchu'

(61) ŋwɑɛ̃̀ pùgə̀ pùgə̀ ê
book red his
'His red book'

(62) mə̃́ lɔ̀/ɔ̀ lɔ̀/ɔ́ ê
child happy his
'His happy child'

1.3.2. Quantifiers

Possessives follow quantifiers of all types.[12]

(34) tìí pɑî pìíncū
three children P.
'Three children of Pinchu'

(35) tìí mɯ̀tɯ́ pìíncū
three trees P.
'Three trees of Pinchu'

1.3.3. Adjunct PPs

Possessives precede Adjunct PPs.[13]

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[12]Again, although I do not have data for possessive pronouns, I expect that they will behave strictly like the possessive DPs. Note too that I am expecting other quantifying expressions (all, many, some, etc.) to appear in the same relative position as the numerals exemplified in (34) and (35).

[13]My data does not contain examples with a possessive pronoun followed by a PP adjunct. However, I see

(63) mí ŋ pìí ncū kɛ̀ má
child P. without mother
'Child of Pinchu without a mother'

(64) mùtɯ́ pìí ncū kɛ̀ mùfùɔ́
trees P. without leaves
'Trees of Pinchu without leaves'

1.3.4. Relative Clauses

Possessives precede relative clauses. Here there is a hole in the data. However, given that they follow adjunct PPs and that adjunct PPs follow possessives, one is led to expect the relative clauses to follow the possessives.

One generalization which flows from this quick look at possessives is the following:

(65) Possessives immediately precede determiners.

1.4. Adjectives

Adjectives come in 2 types: prenominal and postnominal. The normal case is for an adjective to be postnominal:

(15) mɛ́ lɔ̀/ɔ̀ lɔ̀/ɔ́
child happy
'Happy child'

(16) mɯ̀tɯ́ lɛ̃́/ɛ̃̀ (lɛ̃́/ɛ̃̀)
trees large
'Large trees'

However, an adjective like *mbùgɔ̀* 'pretty' can appear prenominally, in which case it takes on an intensified meaning. Contrast the following:

(66) ŋgɔ̃̀ mbùgɔ̀ mbùgɔ́
man pretty
'Pretty man'

(36) mbùgɔ̀ ŋgɔ̃̀
pretty man
'Beautiful, noble man'

The phenomenon is similar to what happens in a language like French where *un grand homme* 'a great man' has a more intense meaning than *un homme grand* 'a tall man' where the adjective is merely denotative.[14]

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no reason to expect surprises and predict a behavior completely parallel to that of possessive DPs.

[14]I do not wish here to provide any explanation of the phenomenon in question. Of course, this

What is interesting to observe, however, is that adjectives in Nchufie always seem to be adjacent to the head noun they modify. This strongly suggests that they are adjoined the noun at some level of representation. Given this property, we need not explore further the distribution of adjectives. They will follow whatever their head noun follows, and precede whatever their head noun precedes.

Notice however that there is a curious cooccurrence restriction between adjectives and the argument (theta-possessive or theme) of a picture-type head noun: both cannot be present at the same time, while with other head nouns, adjectives can cooccur with possessive DPs or pronouns:

(59) mɛ́ lɔ̀/ɔ̀ lɔ̀/ɔ́ pìí ncū
child happy P.
'Happy child of Pinchu'

(61) ŋwaɛ̃ ̀ pùgə̀ pùgə̀ ê
book red his
'His red book'

Finally let us not forget that Nchufie can make use of an adjectival quantifier morphologically based on the quantifier *zɛ̃́ zɛ̃́*, meaning 'many' and with a meaning close to that of 'many', only slightly intensified; something like 'very many':

(23) paî zɛ̃́ zɛ̃́
children many
'Many children'

(25) mʉ̀tʉ́ zɛ̃́ zɛ̃́
trees many
'Many trees'

These quantified adjectives do not seem to behave any differently from any other adjective in Nchufie. This allows us to draw the following distributional generalization for adjectives:

(67) Adjectives are adjoined to their head noun.

1.5. Adjunct PPs

Let us distinguish two types of adjunct PPs, regular and non-theta possessive.

1.5.1. Regular Adjunct PPs

Regular adjunct PPs precede relative clauses, as in (68) and (69), but follow everything else in the DP, as shown in (70) and (71), where they follow the demonstratives.

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phenomenon has been discussed in the literature.

(68) mɛ́ kɛ̀ má á yà pìíncū kwɛ la
child without mother Op that P. likes det
'Child without a mother who Pinchu likes'

(69) tɯ́ kɛ́ mùfùɔ́ á yà pìíncū ŋkɔɔ la
tree without leaves Op that P. cut det
'Tree without leaves which Pinchu cut'

(70) mə́ wì/ī kɛ̀ má
child this without mother
'This child without a mother'

(71) mɯ̀tɯ́ pì/í kɛ̀ mùfùɔ́
trees these without leaves
'These trees without leaves'

1.5.2. Non-Theta Possessives

Non-theta possessives seem to have a similar distribution, as they follow the demonstratives and specific determiners:

(50) fótò yì/í mbuɔ̌ pìíncū
picture this with P.
'This picture in possession of Pinchu'

(51) fótò səɯ̌ / â mbuɔ̌ pìíncū
picture the / the with P.
'The (spec) picture in possession of Pinchu'

What is missing here is the relevant data that compares precisely the relative positions of both types of adjuncts. However, we will see in section 3 that we have reasons to postulate a different position for the `regular' PP adjuncts and the non-thematic possessors due to their contrastive behavior with respect to extraction.

We are now ready to draw our last distributional generalization:

(72) Adjuncts are DP final; relative clauses are the rightmost adjuncts.

1.6. Summary

Nchufie DPs have the following relative word order, modulo certain cooccurrence restrictions and certain gaps in the data collected until now:

(73)

Quantifier	N+Adj	Them Poss	Dem	PP	Rel Cl
	Adj+N	Theme	Spec Det	Non-Them Poss	

2. Agreement and Structure of Nchufie DPs

2.1 Agreement

As we have seen in section 1, quantifiers, which precede the head noun, agree only in number with it. This fact is shown by the absence of any difference between the forms for the indefinite quantifier for the various noun classes, although this quantifier does vary depending on the number of the head noun. Let us illustrate this with the following paradigm:

(31) səɯ̀ mɛ́ kɛ́ mà
some child without mother
'Some child without a mother'

(32) pùsəɯ́ pɑ̃ɪ́ kɛ́ mà
some children without mother
'Some children without a mother'

(74) səɯ̀ tɯ́ kɛ́ mùfùó
some tree without leaves
'Some tree without leaves'

(33) pùsəɯ́ mɯ́tɯ̀ kɛ̀ mùfùɔ́
some trees without leaves
'Some trees without leaves'

(31) and (73) use the form *səɯ* which is undifferentiated for the two head nouns, although we know from the classes of Fall 91 that the head noun of (31) belongs to the class [human], while the head noun of (73) belongs to the class [inanimate].[15] (32) and (33) use the form *pusəɯ* which is a morphological plural: again the form is similar across noun classes. From this, we conclude the following:

(75) Elements which precede the head noun only agree with it in number.

This conclusion is strengthened by the behavior of demonstrative pronouns, i.e., of demonstratives used in surface subject position in construction of the form 'this is, these are, etc.'. Although the facts are not entirely clear at the present time, it appears that at most, class agreement is optional since the form for the demonstrative in (75) is not that of the class [human]: [16]

(76) yì/í mɛ́ lɔ̀/ɔ̀ lɔ̀/ɔ́
this child happy
'This is a happy child'

Specific determiners and demonstratives agree both in number and in noun class with the head noun they are associated with. Witness the contrast in number agreement between

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[15]Nchufie also has a third noun class, specifically for non human animates.

[16]Here I need to get some systematic contrast, as the data at hand so far is murky. The form for the demonstrative class [human] and singular would be *wì/í*.

(1), (2), (5), and (6) on the one hand and (3), (4), (7), and (8) respectively on the other hand, and the contrast in class agreement between (3) and (4) as opposed to (7) and (8) respectively.[17]

(1) mɛ́ â
child the
'the child (specific)'

(2) mɛ́ səɯ̀
child the
'the child (specific)'

(3) pɑ̃ı́ pà
child the
'the children (specific)'

(4) pɑ̃ı́ pɔ̀
children the
'the children (specific)'

(5) tɯ́ à
tree the
'the tree (specific)'

(6) mɯ̀tɯ́ səɯ̀
tree the
'the tree (specific)'

(7) mɯ̀tɯ́ mà
trees the
'the trees (specific)'

(8) mɯ̀tɯ́ mɔ̀
trees the
'the trees (specific)'

The same agreement pattern is found between the head noun and demonstratives. Thus in the singular, (77) and (79) contrast in number with (78) and (54) respectively, while (77) and (78) contrast in noun class with (79) and (54):

(77) mɛ́ wì/í wâ pìı́ncū ŋjəɯ̀
child this which P. saw
'This is the child that Pinchu saw'

(78) pɑ̃ı́ pì/í pâ pìı́ncū njəɯ́
children these Op P. saw
'These children which Pinchu saw'

(79) tɯ́ yì/í â pìı́ncū ŋkɔɔ
tree this Op P. cut
'This tree which Pinchu cut'

---

[17]Note that the difference between the two types of specific determiners is one that has to do with prior discourse reference: *â / mâ / pâ* serves to introduce a referent not already present in the discourse context, while *səɯ̀ / mɔ̀ / pɔ̀* serves to refer back to a referent mentioned earlier in the discourse context.

(54) mɯ̀tɯ́ mì/i má pìíncū ŋkɔɔ
trees these Op P. saw
'These trees which Pinchu cut'

This pattern is once again found with possessive pronouns, although the class contrast appears to be neutralized in the singular.[18] Thus (80) and (81) appear to have the same form for the possessive pronoun, but crucially, these two forms differ in number with (42) and (14), two forms which independently have a different class agreement on their possessive pronouns: [19]

(80) miŋ̀ è səɯ̀
child his the
'The his child'

(42) pɑ̄í́ pé pɔ̀
children his the
'The his children'

(81) tɯ́ è səɯ̀
tree his the
'The his tree'

(14) mɯ̀tɯ́ mé mɔ̀
trees his the
'The his trees'

This systematic pattern of agreement when an agreeing element follows the head noun can be formulated as follows:

(82) Elements which follow the head noun agree with it in number and in class.

2.2. Structure

So far we have made the following observations:

(37) Head nouns precede most of the DP material expect for quantifier-type elements and a restricted class of adjectives.

(55) Specific determiners and demonstratives have a complementary distribution in DPs and they occur in the final position of the DP, followed only by adjunct type material.

(65) Possessives immediately precede determiners.

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[18]The neutralization in class contrast which I have found while eliciting this data contradicts data collected in class in Fall 91. That earlier data is probably of better quality since I have been concentrating mostly on the word order and not on the sounds themselves.

[19]Note that I have not yet asked our consultant if the pronouns which I have called possessive throughout this paper can also function as theme arguments with picture-type head nouns. One would expect this to be true, however, given the other parallelisms noted between theta-possessive and theme arguments.

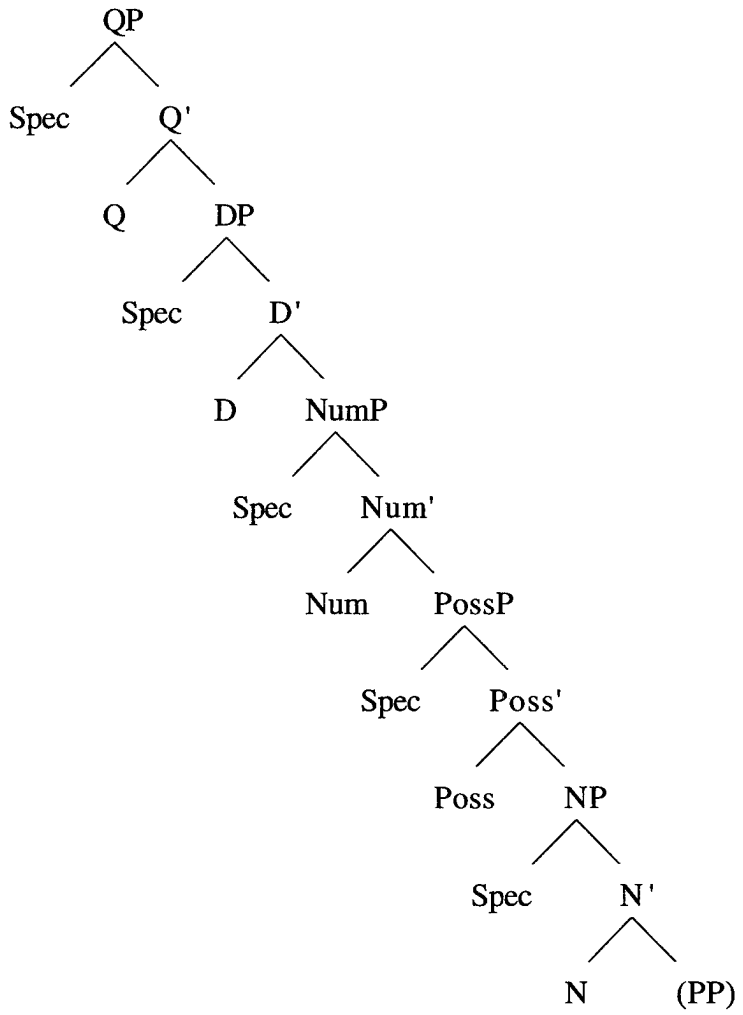
(67) Adjectives are adjoined to their head noun.

(72) Adjuncts are DP final; relative clauses are the rightmost adjuncts.

(82) Elements which follow the head noun agree with it in number and in class.

The facts of agreement sketched above, and the various distributional properties lead me to propose the following structure for Nchufie DPs: [20]

(83)



I would now like to make the following hypotheses, none of which I assume is unheard of:

I. Arguments are always projected in specifiers. This is why I do not show any 'internal' argument in the geometrical sense of the word in (83);

II. Nchufie head nouns generally fail to assign any thematic role and therefore they are

[20]In this structure I do not deal with adjectives, as I do not have much to say about them; I also do not talk about non-theta possessors, adjunct PPs, or relative clauses. I will come back to this in a little bit.

intransitive, in which case only possessors are allowed.

III. Nchufie nouns of the picture-class are unaccusative, i.e., they fail to assign an external theta-role and to assign structural Case to their theme argument in their D-structure position. This accounts for why agent arguments are not found in Nchufie. This also forces the movement of the theme argument.

IV. Nchufie nouns assign structural Case. Witness the fact that their possessor/theme arguments are not preceded by any preposition.[21] However they do not obtain this Case assigning ability before moving up to the NumP projection, the projection in which their agreement features are syntactically activated.

V. Case is assigned under government to the specifier of PossP.

VI. Both possessors and theme arguments compete for the only Case available. This explains why they cannot cooccur. I assume that the possessor is projected in the [Spec, PossP], while the theme argument is projected in [Spec, NP] and must raise to its Case position, i.e., [Spec, PossP] by assumption.

The noun movement from N to Num gives the proper word order between the head noun and its possessor/theme argument. However it does not allow us to account for the fact that head nouns and possessor/themes precede the specific determiners and demonstratives. One would like to say that these later lexical items belong to the D category, probably a universal property of such elements. I am going to say exactly this, and derive the fact that they occur apparently very low in the DP by assuming the following.

VII. When an overt D is present in the structure, it must be licensed at S-structure by Spec-Head Agreement with the extended N projection it immediately governs.[22]

This hypothesis forces the whole NumP projection to move to [Spec, DP] and derives the correct word order for DP internal material. We will see that this hypothesis provides us with a straightforward structural way to derive the Specificity Island effects with respect to the extraction of material from inside the DP. Assumption VII leaves open the specifics of what happens if there is no overt D in the structure. Two options are open: either nothing moves to D, or the head noun fills D on its own. At this point either option will work; therefore I do not wish to choose between them.

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[21]This hypothesis might be wrong given a proper analysis of the associative construction.

[22]Note this is a candidate for a universal property at LF.

We finally need to explain our agreement generalization: observe that all the elements that follow the head noun are now in a Spec-Head relation with it at S-structure, either directly (for the possessive pronouns) or via feature percolation to NumP (for the Determiners). I thus propose the following.

VIII. Class agreement requires Spec-Head Agreement at S-structure.[23]

3. WH Movement in DPs: Preliminary Results

One thing that I haven't talked about in section 2.2 is the structural representation of adjuncts inside DPs. The first question to be answered is whether they are left- or right-adjoined. Given the fact that they appear in the final position of DPs, and given that I have assumed that everything else moves up at least to NumP, the adjuncts could very well be left-adjoined to lower DP projections. I do not think that this is on the right track however, given (a) an assumption that adjunction is to the same side for all adjuncts, and (b) that relative clauses, which one would assume to be adjoined very high in the DP, occur in DP final position after all other adjuncts. This last fact argues for a representation of DP adjuncts in which they are right-adjoined. More specifically, without any supporting evidence, I would like to propose the following.

IX. 'Regular' adjuncts are right-adjoined to NP; relative clauses are right adjoined to DP.

Note that IX says nothing about non-theta possessors. I will return to these in a little while.

We are now ready to look at the facts of WH questions that I have been able to isolate so far. Notice that I have focussed on extraction from the direct object position. This is so because, in Kural and Moritz, as well as in Sano (this volume), it has been shown that WH-questioning is easier to obtain in this position than in subject or adjunct position. This strategy has the following consequence: the elements that will be shown to be unable to move from inside a DP in object position are predicted to behave in the same fashion if the DP were in subject or adjunct position. However, the elements that can extract from inside an object DP might very well not be able to extract from a subject or adjunct DP. Only further research will allow us to establish this.

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[23] I do not provide a characterization of the conditions under which number agreement obtains, as I feel that more data pertaining to this issue is needed. At this point, one might want to argue that pure number agreement may obtain by adjoining to the quantifiers or to the subject demonstratives at LF, in a manner analogous to what has been labelled 'expletive replacement' in the literature.

A. 'Regular' adjuncts can never extract from object DPs:[24]

(84) *ɔ̀ɔ́ ŋkɔ̀ŋ mɛ́ kɛ́ wə̄́ / nyɛnɔ̃ ŋɔ̃
you+SH touched child without who / which person
'You touched a child without who'

(85) *ɔ̀ɔ́ ŋkɔ̀ŋ tɯ́ kɛ́ kɔ̃⁻́
you+SH touched tree without what
'You touched a tree without leaves'

(86) WH in adjunct in like those in sentences like (31) are ungrammatical

This non-extractability of adjuncts is expected since we know independently that adjuncts in general cannot extract from DPs, be it at S-structure or at LF.

B. Possessors/themes can extract from determinerless DPs, even when they are governed by a quantifier: [25]

(87) ɔ̀ɔ́ njəɯ̀ fótò wə̀ / nyɛ́nɔ̀ ŋɔ̃̂
you+SH saw picture who / which person
'Whose picture (possessive or theme) did you see?'

(88) ɔ̀ɔ́ njəɯ̀ tìí mɯ̀fótò wə̄́
you+SH saw three pictures who
'You saw three pictures of who'

(89) mɑ̀ɑ́ njəɯ̀ zɛ̃̂ mɯ̀fótò wə̄́ / nyɛnɔ ŋɔ̃
I+SH saw many pictures who / which person
'I saw many pictures of who'

(90) mɑ̀ɑ́ njəɯ̀ ŋkɑ̂ mɯ̀fótò wə̄́ / nyɛnɔ ŋɔ̃
I+SH saw all pictures who / which person
'I saw all pictures of who'

This extractability argues for a view of the quantifiers under which they would be heads of QP. That way the specifier of QP would be free for WH quantifiers to move through it to [Spec, CP].

C. Possessor/themes cannot move out of a specific DP:

(46) *ɔ̀ɔ́ njəɯ̀ fótò wə̄́ yì/í / ɑ̂ / səɯ̀
you+SH saw picture who this / the / the
'You saw this / the (specific) picture of who'

(47) *ɔ̀ɔ́ njəɯ̀ tɯ́ wə̄́ yì/í / ɑ̂ / səɯ̀
you+SH saw tree who this / the / the

---

[24]Note that the sentences are not necessarily ungrammatical, but their grammatical reading involve main clause adjunct interpretation.

[25]Note however that I am missing the relevant data with quantifiers which agree overtly in number with the head noun, i.e., with *səɯ̀* 'some'. If this Q were to block movement one could argue that number agreement is checked under Spec-Head agreement at LF, in which case the DP must move to the specifier of Q: this movement would then condemn any WH movement from inside the DP itself.

'You saw this / the (specific) tree of who'

This ungrammaticality follows straightforwardly from hypothesis VII of section 2.2. Indeed, if PossP must move to [Spec, DP] to license the determiner, then extraction out of DP will be made impossible since, crucially, such extraction must make use of Spec DP. Notice that if this way of looking at specificity is correct, one might want to extend to all cases of specific islands:

(91) *who did you see this picture of ?

In (91), then, one would rule out the extraction because at LF the XP 'picture of t' must move to [Spec, DP]; but this position is already occupied by a trace of a WH word. Alternatively, if one believes that intermediary traces of arguments must delete at LF (see e.g., Lasnik and Saito 1984 among others), one could argue that the licensing of the specific determiner would be made impossible by the fact that the XP in [Spec, DP] contains an open variable making it non-specific and preventing it from being a specificity licensor.

D. Themes/possessor can move in the presence of a non-theta possessor, (92), and vice versa, (93):

(92) ɔ̀ɔ́ njəɯ̄ fótò wə̄́ mbùɔ́ pìí ncū
you+SH saw picture who to P.
'You saw the Pinchu's (poss) picture of who (theme)'

(93) ɔ̀ɔ́ njəɯ̄ fótò kɛɛ́ŋɔ̀ mbùɔ́ wə̄́
you+SH saw picture who to who
'You saw whose (poss) picture of Kengo (theme)'

It is easy to account for (92): since we have independent reason to believe that non-theta possessors are adjuncts of some sort, namely the fact that determiners linearly precede them, we do not expect that adjunct to have an effect on the extractability of arguments from DP. However, (93) is a nightmare, and furthermore, the strength of the judgment is such that one cannot weed it out on the pretence that it is simply 'bad data'. The problem is the following: if non-theta possessors are adjuncts, they should behave like 'regular' adjuncts and be never allowed to extract, irrespectively of whether there is anything but the head noun in the DP. The fact that they can extract suggests therefore that they are structurally different from 'regular' adjuncts. The proposed structure for Nchufie DPs in (83) opens the door for another structural position for the non-theta possessors: namely they could be sitting in the PP complement of DP. This would be a position which, although not thematic in the way referential argument positions are, would however belong to the set of positions selected by the head noun. This idea parallels Kratzer's (1988)

proposal for spatio-temporal XPs in clauses. However, even in this case, we run into a major problem since we know independently that extraction from inside DP is constrained by a hierarchy which causes higher arguments to block the extraction of lower arguments. This constraint seems to hold quite generally and forces us to expect an asymmetry of some sort, i.e., we expect either (92) or (93) to be ungrammatical. One way out maybe, is to assume that the PP complement of N is an A'-position, and to assume further assume that, inside an extended projection in the sense of Grimshaw (1991), only like specifiers block the movement of like specifiers. If that is true, then nothing prevents the non-theta possessor to raise directly from the bottom A'-position to [Spec, DP], the next A'-specifier up the extended nominal projection. However, this would be quite a stipulative account.

This quick look at extraction from DP in Nchufie reveals how much more work needs to be done in order to address the question that motivates this research, namely that of whether LF movement is local in the same way as S-structure or morphological movement. Here is a list of some of the things that need to be looked at:

1. fill the holes in the data mentioned throughout this report;
2. examine agreement patterns more carefully, in particular when the agreeing element precedes the head noun;
3. try extracting from DP out of non-object position, in particular from subject and indirect object positions;
4. come up with more data on non-theta possessors to ascertain their status in the DP;
5. look at binding theoretic data to establish more precisely the level of adjunction for `regular' PP adjuncts and relative clauses.

Clearly, this is an embryo of a research on Nchufie DPs. It does not mean to be more.

REFERENCES

Ben-Shalom, D. This volume. `The Tones of Nchufie Verbal Inflection'

Grimshaw, J. 1991. 'Extended Projection', Ms., Brandeis U.

Kratzer, A. 1988. *Stage-Level and Individual-Level Predicates*. Ms. University of Massachusetts, Amherst.

Kural, M. and L. Moritz. This volume. 'Nchufie Wh In Situ and Locality.'

Lasnik, H. and M. Saito. 1984. 'On the Nature of Proper Government', *Linguistic Inquiry*, 15.2, 235-289.

Sano, T. This volume. `Resumptive Pronouns in Nchufie, the ECP, and the Least-Effort Condition'.

Silverman, D. This volume. `On Optional and Obligatory Prenasalization in Nchufie Reduplication'.

Sportiche, D. 1990. *Movement, Agreement, and Case*, Ms., UCLA.

RESUMPTIVE PRONOUNS IN NCHUFIE, THE ECP, AND THE LEAST-EFFORT CONDITION*

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0. Introduction

In this paper, I present my observations on resumptive pronouns in Nchufie, focusing on those in relative clauses. My goal is to account for the distribution and nature of resumptive pronouns in Nchufie in terms of UG principles, and thus to attain explanatory adequacy. Nchufie resumptive pronouns never appear in the direct object position and obligatorily appear in other argument positions: subject, indirect object, and possessor position in NP. I will argue that the distribution follows from the formal licensing condition of the ECP (which is formulated conjunctively, cf. Stowell 1981, Jaeggli 1982, Rizzi 1990, among others), with a stipulation that the indirect object position is not properly head-governed in this language. Nchufie resumptive pronouns are 'syntactic resumptive pronouns' in the sense of Zaenen, et al. (1981), Sportiche (1983), and Koopman (1984); in other words, they behave like *wh*-traces. I will suggest that their nature as *wh*-trace follows from the condition of 'least-effort' (cf. Chomsky 1991).

1. Distribution

In this section, we observe the distribution of resumptive pronouns in relative clauses in Nchufie, with some introduction to the structure of Nchufie relative clauses.

I posit the structure of CP in Nchufie relative clauses as in (1). (Basic examples of relative clauses are found in (3)-(9)).

(1) $[_{CP}\ \underset{Op}{a}\ [_{C'}\ [_{C}\ \underset{COMP}{ya}]\ [_{IP} \ldots]]]$

The complementizer does not show overt agreement in relative clauses. However, the

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* I thank Hilda Koopman and Murat Kural for helpful comments and suggestions. Thanks also go to Sophie, our informant, and Michael Nkemji, who worked together with me in eliciting the data.

operator agrees with the head noun with respect to number (cf. (5) vs.(6), also *ma* in (4)) and some noun classes (I will not discuss them in this paper). The overt operator becomes silent in rapid speech, but it seems that it is always there as it shows up in slow speech. When the operator agrees with a plural head noun, the complementizer becomes silent in rapid speech, but again it may show up in slow speech. Hence, as a linguistic representation, it is reasonable to posit the structure (1), abstracting away from the silent character in rapid speech. (It may be of interest that at least either the operator or the complementizer should be phonetically overt, but I do not know what this suggests.)

There is an operator movement from the trace position to SpecCP, since there is a Subjacency effect on the chain between the operator-trace relation (cf. (2)).

(2) *[ŋɛ̀ɛ́$_i$ [O_i yâ ǹ jí [sɔ́ŋ$_j$ [O_j yâ [ǎ$_j$ njàā t_i]]]]]
book COMP I know friend COMP he N-steal
'The book which I know the friend who stole (it)'

(The N-prefix on the verb implies past tense with this particular tonal pattern).

In Nchufie relative clauses, the (overt) resumptive pronouns and the *wh*-traces are in complementary distribution: they are impossible in the direct object position and they are obligatory in other argument positions.

Direct Object: Impossible

(3) sɔ́ŋ (a)yâ ǹ jí (*ɛ̀) (lā)
friend COMP I know him SPEC
'The friend whom I know'

('*la*', glossed as SPEC, is a marker for specific nouns).

(4) mʉ̀t^{h}ʉ̂má (yà) pìincu kwɛ̂ (*o) (lā)
trees COMP like them SPEC
'The trees which Piinchu likes'

Subject: Obligatory

(5) sɔ́ŋ (a)yâ *(ā) tân fàa (lā)
friend COMP he HAB work SPEC
'The friend who works'

(6) mʉ̀sɔ́ŋ pá(yà) *(po) tân fàa (lā)
friends COMP they HAB work SPEC
'The friends who work'

Indirect Object: Obligatory

(7) mɛ̀ɛ̀ (á)yâ mǎ mfə̄ *(ɛ̀) mùmbú (lā)
child COMP I N-give him dog SPEC
'The child whom I gave a dog'

Possessive: Obligatory

(8) mɛ̀ɛ̀ (á)yà kɔ̂ŋ *(ɛ́) tʰúà (lā)
child COMP bed his dirty SPEC
'The child whose bed is dirty'

(9) sɔ́ŋ (á)yà ǹ jí mîŋ *(í) (lā)
friend COMP I know child his SPEC
'The friend whose child I know'

Note: A possessive pronoun agrees with the head noun with respect to noun classes.

There is a similar distribution in Vata: 'if the target of extraction is in the subject position, a resumptive pronoun must appear; if it is in the direct object (or the indirect object or a subcategorized PP), a trace occurs the extraction site (cited from Koopman and Sportiche 1986, 360-1)'. The two languages differ as to the status of indirect object. I will come back to the similarities and differences later.

2. Nature

In this section, we observe the nature of resumptive pronouns in Nchufie. Sportiche (1983), following Zaenen, et. al. (1981), shows that there are two types of resumptive pronouns: 'syntactic resumptive pronouns', which behave like *wh*-traces or variables, and 'true resumptive pronouns', which behave like pronominals. I will present data which indicate that the ones in Nchufie relative clauses are 'syntactic resumptive pronouns'.

2.1. Subjacency

In Nchufie, an A'-chain obeys Subjacency even with a resumptive pronoun. We have already seen that extraction out of a relative clause is illicit, a standard Subjacency effect.

(2) *[ŋwɛ̀ɛ́$_i$ [O_i yâ ǹ jí [sɔ́ŋ$_j$ [O_j yâ [ǎ$_j$ njàā t_i]]]]]
book COMP I know friend COMP he N-steal
'The book which I know the friend who stole (it)'

Moreover, even when a resumptive pronoun occurs in the position of the tail of a chain, the Subjacency effect is observed (cf. the ungrammaticality of (10)).

(10) *[sɔ́ŋ$_i$ [O_i yâ ǹ jí [nwɛ̀ɛ́$_j$ [O_j yâ ǎ$_i$ njàá t_j]]]]
friend COMP I know book COMP he N-steal
'The friend who I know the book which (he) stole'

Thus, the resumptive pronoun acts like a *wh*-trace with respect to Subjacency.

In contrast, a chain with a true resumptive pronoun disobeys Subjacency. (11) is such an example in English.

(11) [The man$_i$ [who$_i$ they think that if Mary marries him$_i$, then everyone will be happy]]
(from Chomsky 1982, 11)

2.2. Weak Crossover

Nchufie resumptive pronouns trigger the WCO (Weak Crossover) effect. (12) is an instance of the standard WCO. In the case of English, the WCO effect is easily attested in *wh*-questions, but not in relative clauses. However, in Nchufie, it is found even in relative clauses, as in (12). (13) is crucial for the point. Although the A'-chain has a resumptive pronoun *a* in the tail position, it triggers the WCO effect, just like (12) which has a gap in the tail position.

(12) [mɛ̂ɛ$_i$ [O_i yâ sɔ̄n ɛ́*$_{i/j}$ kwɛ́ t_i]]
child COMP friend his like
'The child whom his friend likes'

(13) [mɛ̂ɛ$_i$ [O_i yâ sɔ̄n ɛ́*$_{i/j}$ kwàá njíɛ̀ à$_i$ púɣɔ̀]]
child COMP friend his think that he good
'The child whom his friend thinks (that he) is good'

Therefore, with respect to WCO, Nchufie resumptive pronouns are no different from *wh*-traces.

In contrast, there are examples in other languages in which an A'-chain with a resumptive pronoun is immune to the WCO effect, for example, Modern Hebrew, Egyptian Arabic, etc.

(14) Hebrew (from Sells 1984, 77):

[ha'iš$_i$ [še$_i$ im-o$_i$ ohevet oto$_i$]]
the man who mother-his loves him
'The man who his mother loves'

(15) Egyptian Arabic (from Sportiche 1983, 120):

miin$_i$ illi marat-uh$_i$ bitbuus-uh$_i$
who that his-wife is kissing him

2.3. Parasitic Gap

Nchufie resumptive pronouns license parasitic gaps. (16) is a Nchufie example of a standard parasitic gap construction. (17) is significant as the tail of the A'-chain in the subject position of the embedded clause licenses a parasitic gap even though the tail is a resumptive pronoun.

(16) zòô a_i yá ŋ̀ kwɛ̄ t_i kɛ̄ kā njǔ e_i
yam COMP I like without eating
'The yam which I like without eating'

(17) zò̰ô̰ a_i yá ŋ̀ kwà̰á̰ kɛ̄ kā njǔ e_i njíɛ̀ à$_i$ púɣɔ̀
yam COMP I think without eating that it good
'The yam which I think without eating (that it) is good'

In this respect again, Nchufie resumptive pronouns pattern with *wh*-traces.

A different situation holds in languages like Modern Hebrew, Egyptian Arabic, English, etc., where a resumptive pronoun in an A'-chain does not license parasitic gaps.

(18) *John$_i$, I talked to him$_i$ without having ever seen e_i (from Sportiche 1983, 118)

To sum up this section, we have seen that in Nchufie an A'-chain with a resumptive pronoun obeys Subjacency, triggers the WCO effect and licenses parasitic gaps. Thus, a Nchufie resumptive pronoun acts like a syntactic resumptive pronoun, according to the standards established in Sportiche (1983). Below I list known examples of the two types of resumptive pronouns.

(19) a. syntactic resumptive pronouns:

Nchufie, Vata (cf. Koopman 1984, Koopman and Sportiche 1986), Swedish (cf. Sells 1984, Engdahl 1985)

b. true resumptive pronouns:

Hebrew non-free relative (cf. Sportiche 1983, Sells 1984), Arabic (cf. Sportiche 1983), and in many languages for escaping a Subjacency violation (cf. (11)).

Shlonsky (1992) argues for a different treatment of Hebrew resumptive pronouns. We will come back to his treatment in section 4.

3. Explanation

In this section, I will attempt to explain the distribution and the nature of Nchufie resumptive pronouns. For the explanation, the conjunctively formulated ECP (Stowell

Vata, which could be extended to Nchufie. That is, insertion of phonetic content is more costly than doing nothing, and this is why a resumptive pronoun cannot occur in the direct object position).

The proposed account derives the distribution and the nature of resumptive pronouns from UG principles. This means that children acquiring a language with resumptive pronouns do not have to learn the type of resumptive pronouns in the target language (i.e., whether they are 'syntactic' or 'true'). The syntactic resumptive pronouns need not be learned at all, since their emergence is forced by UG principles: children insert overt pronominals to avoid the ECP violations or they just do not produce such constructions that violate the ECP. The true resumptive pronouns are (optionally) inserted for unknown reasons (i.e., the economy consideration should not allow the insertion of optional elements, but it may be due to extra-grammatical factors such as processing). The crucial point for learnability is if children face a problem in deciding a resumptive pronoun to be 'syntactic' or 'true'. I argue that such a problem does not arise, because the distinction between 'syntactic' and 'true' is not real in this account. When a pronoun is inserted into a position which would cause the ECP violation if nothing is inserted, it is called 'syntactic', and other inserted pronouns are called 'true'. There is no possibility of putting a 'true resumptive pronoun', which is optional, into a position of the ECP violation, for example, since the insertion is obligatory into such a position and the inserted pronoun is called 'syntactic' just as a result. Thus, the account in this paper has an advantage as to the learnability issue over the one which assumes the 'syntactic'/'true' distinction to be real.

4. Consequences and Remaining Issues

As a consequence of the proposed account, it is predicted that even in one language two different types of resumptive pronouns can appear, and this is borne out in Swedish. On the one hand, Swedish has a resumptive pronoun in question, relativization, and topicalization constructions that obligatorily appears in the subject position of an embedded clause with complementizers other than the proper governor *som*, (cf. Sells 1984, Engdahl 1985). This resumptive pronoun is a syntactic resumptive pronoun; the chain containing it is immune to Subjacency and triggers WCO effects, and licenses a parasitic gap. On the other hand, the resumptive pronoun that appears in Swedish left-dislocation is a true resumptive pronoun; it does not license a parasitic gap, etc. (cf. Engdahl 1985, 11). Significantly, the distribution of the former is restricted exactly to the position which is not properly head-governed, i.e., the subject position with non-proper

1981, Jaeggli 1982) and the principles of 'least-effort' are necessary. In other words, with the data of Nchufie resumptive pronouns, I will give supportive arguments for the two particular principles of UG.

First, I argue that Nchufie resumptive pronouns appear in order to avoid an ECP violation, adopting Rizzi's (1990) definition (20) (cf. also Koopman and Sportiche 1986).

(20) ECP: A nonpronominal empty category must be

(i) properly head-governed (Formal licensing)
and (ii) antecedent-governed (Identification) (Rizzi 1990)

Assuming that in Nchufie, only the direct object position is properly head-governed among argument positions, the distribution in (3)-(9) follows. This is not an extraordinary assumption, since, for instance, *wh*-movement from the indirect object position is impossible in English, as in (21).

(21) *Who(m)$_i$ did you give t_i a book?

This may follow from the definition of 'proper head-government' as government by a lexical head within X' (cf. Rizzi 1990) and the assumption that the indirect object is outside the V' (But in Vata, traces are obligatory in the indirect object position, as well as in the direct object position. I presume the difference comes from an exceptional status of indirect object position in Vata -- it is inside V' in Vata --, but I have no argument for that.)

The proposed account presupposes the conjunctive formulation of the ECP. If the ECP were disjunctively formulated, it would not explain the distribution of Nchufie resumptive pronouns, as they appear even in local movement, such as (5)-(9), where antecedent government is certainly satisfied. In other words, the Nchufie data of resumptive pronouns gives support to the conjunctive formulation of the ECP.

Secondly, I want to argue that the nature of a Nchufie resumptive pronoun as a *wh*-trace follows from the proposed ECP account and the condition of 'least-effort'. According to my account, Nchufie resumptive pronouns appear in order to avoid an ECP violation. All is needed for this is to insert some phonetic content into the position of an 'offending trace' and changing any syntactic feature of the trace, in particular, changing to a pronominal, is unnecessary. From the condition of 'least-effort', which prohibits unnecessary operations, it follows that a Nchufie resumptive pronoun inherits all syntactic nature of the original trace, and behaves as *wh*-traces. A syntactic resumptive pronoun is the spell-out of a *wh*-trace (Koopman (1984) has another Economy-type of account for

head-governor complementizers in the C position above, whereas the distribution of the latter is not restricted. This difference supports the idea that the former appears for ECP reason, while the latter has no particular reason to appear.

There are questions that remain. Among others, the status of positions other than subjects and direct objects are not clear. First, although the indirect position is not properly head-governed, adjunct positions seem to be.

Adjuncts

(22) lɛ̀ɛ̀ fâ/yâ ǹ tân cūo (lā)
village where I HAB live SPEC
'The village where I live'

(23) kɛ̂ ǹ tân fáà (lā)
how I HAB work SPEC
'The way I work'

Probably, by having recourse to proper head-government by T or Agr (cf. Rizzi 1990), we can eliminate this problem. Since this is necessary for English and many other languages, the problem may not be so serious. (Also, the structure of C-projections in (22) and (23) are not clear.)

Second, more seriously, there seems to be parametric variation as to the status of indirect object position: it is not properly head-governed in Nchufie, English, etc., but is in Vata, at least. It seems that we need to study double object constructions in Nchufie and Vata in detail if we attempt to have satisfactory account of the variation.

Finally, Shlonsky (1992) argues that the distribution of Hebrew resumptive pronouns follow from the principle of last-resort (i.e., least-effort), despite the superficial optional appearance in some positions. The A- or A'- status of SpecCP plays a crucial role in his account. The case of Nchufie does not fit in the account of Hebrew by Shlonsky in some crucial respects. First, in Nchufie, even matrix subjects require obligatory resumptive pronouns (cf. (5) and (6)). Second, SpecCP does not agree with C in Nchufie, hence it is an A'-position in Shlonsky's terms, but resumptive pronouns are obligatory in positions other than the direct object and adjunct. I leave these differences open for further research. What might be relevant is the fact that the overt operator agrees with the head noun in Nchufie as to number and/or noun classes (i.e., *a/ma/pa/wa*, cf. (3)-(6)).

REFERENCES

Chomsky, N. 1982. *Some Concepts and Consequences of the Theory of Government and Binding*, MIT Press, Cambridge, Mass.

Chomsky, N. 1991. Some Notes on the Economy of Derivations and Representations, in R. Freidin ed. *Principles and Parameters in Comparative Grammar*, MIT Press, Cambrige, MA.

Engdahl, E. 1985. Parasitic Gaps, Resumptive Pronouns, and Subject Extractions, *Linguistics* 23, 3-44.

Jaeggli, O. 1982. *Topics in Romance Syntax*, Foris, Dordrecht.

Koopman, H. 1984. *The Syntax of Verbs*, Foris, Dordrecht.

Koopman, H. and D. Sportiche. 1986. A Note on Long Extraction in Vata and the ECP, *Natural Language and Linguistic Theory* 4, 367-374.

Rizzi, L. 1990. *Relativized Minimality*, MIT Press, Cambrige, MA.

Sells, P. 1984. *Syntax and Semantics of Resumptive Pronouns*, PhD dissertation, University of Massachusetts, Amherst.

Shlonsky, U. 1992. Resumptive Pronouns as a Last Resort, *Linguistic Inquiry* 23, 443-468.

Sportiche, D. 1983. *Structural Invariance and Symmetry in Syntax*, PhD dissertation, MIT.

Stowell, T. 1981. *Origins of Phrase Structure*, PhD dissertation, MIT.

Zaenen, A., E. Engdhal and J. Maling. 1981. Resumptive Pronouns Can Be Syntactically Bound, *Linguistic Inquiry* 12, 679-682.

ON WH-QUESTIONS IN NCHUFIE*

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0. Introduction

This paper deals with wh-constructions in Nchufie. One of the typological characteristics of Nchufie is that it belongs to the group of languages, including Chinese, Japanese, and Korean, that lack overt wh-movement.[1] This means that wh-phrases in Nchufie are not in the Spec of CP at SPELL-OUT. Thus, they are, in fact, all cases of wh-in-situ. There are three kinds of wh-questions in Nchufie: (i) garden-variety wh-in-situ, (ii) the cleft construction in which the wh-phrase is clefted, and (iii) the post-verbal wh-subject construction.

First, the following are some examples of wh-questions in which wh-words remain in situ.

(1) pǐíncū ʒʉ̂ kɔ̌ɔ̃
Piinchu eat what
'What is Piinchu eating?'

(2) ɔ̀ zí njíɛ̰̀ pǐíncū wə̀
you know comp Piinchu who
'Who do you know that Piinchu likes?'[2]

The second type of wh-question involves the cleft construction in which wh-phrases are clefted. In the cleft construction in Nchufie, the third person singular pronoun *a*, used as an expletive subject, occupies the usual subject position, which I take to be the Spec of AGRsP. In the present tense, the copula is phonetically null, as in (3). When the

* I would like to thank our linguistic consultant Sophie Ajeakwa. Thanks are also due to Hilda Koopman, Murat Kural, Anoop Mahajan, and Tim Stowell for comments and suggestions. I am also grateful to the participants in the Field Methods course held in the 1991 Fall and 1992 Winter Quarters at UCLA. The usual disclaimer applies.

[1]For recent claims that such non-wh-movement languages do have syntactic wh-movement, see Watanabe (1991, 1992).

[2]Interestingly, the wh-in-situ always takes scope over the matrix clause in Nchufie. Therefore, (2) does not mean 'Do you know who Piinchu likes?' This point will be taken up later in section 1.

subject wh-phrase is clefted, the third person singular pronoun *a*, is used as a resumptive pronoun, as shown in (3).

(3) á wə̀ yā à cuó ŋ̩kǎà
3s who comp 3s prog N-run
'Who is it that is running?'

(4) á m͡bə̂ kə̀ yā n͡dɛ̌ nj̩ɔ̌ zūŋ
3s N-cop what comp Nde N-eat yesterday
'What was it that Nde ate yesterday?'

The third type of wh-question is used only when the wh-phrase is the subject of a clause. In this construction, the resumptive pronoun occupies the Spec of AGRsP, and the wh-subject follows the tensed verb. When the verb in question is a transitive verb, the tensed verb preceding the wh-subject leaves a copy of its own in what I call 'N-form.'

(5) à ɣwɛ̀ wə̀
3s laugh who
'Who is laughing?'

(6) à ʒɯ̄ wə̀ ɲjɯ̄ mákàpù
3s eat who N-eat cocoyam
'Who is eating a cocoyam?'

(7) àá njwà wə̀ njwá pʰìɛ́ mɯ̀ŋ̩kǐ m͡bwɔ̌ kɛ́ɛ́ŋɔ̄
3s N-sing who N-sing two pl-song for Keengo
'Who sang two songs for Keengo?'

In fact, this construction is not restricted to wh-questions. The necessary condition for this construction seems to be that the subject DP receives focus.

(8) àá nīŋ mà níŋ ŋ̩kî
3s N-cook I N-cook water
'It is I who cooked water.'

(9) àá ntùŋ mà ntùŋ pîincù
3s N-kick I N-kick Piinchu
'It is I who kicked Piinchu.'

(10) ndɛ̌ ŋ͡kwàá njíɛ̂ àá ŋ͡kɯ̄ kɛ́ɛ́ŋɔ̄ pò pîincū ŋ͡kɯ̄ mákāpù
Nde N-think comp expl N-chew Keengo and Piinchu N-chew cocoyam
'It is Keengo and Piinchu that Nde thought ate cocoyam.'

The phenomenon seen in (6)-(10) is an example of what I call verb doubling in this paper. I will look mainly at the cleft construction and the post-verbal wh-subject construction, and only lightly touch on the wh-in-situ construction, which is dealt with by Kural and Moritz (this volume). I will also point out that verb doubling provides evidence *for* the Copy Theory of Movement and *against* the Theory of Feature Checking proposed in Chomsky (1992).

1. Wh-in-situ

It has been shown by Kural and Moritz (this volume) that LF movement of wh-in-situ obeys subjacency, except for argument extraction from a Noun Complement type.[3]

There is a crucial language-specific property of Nchufie, namely, wh-phrases cannot be in the subject position of a clause. Such sentences receive only an echo question interpretation and are ill-formed as normal questions (see (11)-(12)).[4] I assume that the reason for this restriction is that the Spec of AGRsP is strongly nonfocal[5] in this language. Wh-phrases must receive focus, and therefore cannot be in the Spec of AGRsP in Nchufie.

(11) *wə̌ cuó ndíɛ̀ɛ̀
who prog N-sleep
'Who is sleeping?'

(12) *wə̌ cuó nìŋ nyoʒɯ
who prog (N-)cook thing-eat
'Who is cooking food?'

It seems that the Spec of AGRsP in embedded clauses is still nonfocal, but to a lesser degree, and that wh-phrases seem to be able to occur there.

(13) ndɛ̌ kwa̰a̰ njíɛ̰ pʼíncū kwa̰a̰ njíɛ̰ wə̌ kwɛ̌ kɛ́ɛ́ŋɔ̄
Nde think comp Piinchu think comp who like Keengo
'Who does Nde think that Piinchu thinks likes Keengo?'

(14) ndɛ̌ ŋkwa̰a̰ njíɛ̰ à á ŋkū kɛ́ɛ́ŋɔ̄ pò pʼíncū ŋkū mákāpù
Nde N-think comp 3s N-chew Keengo and Piinchu N-chew cocoyam
'It is Keengo and Piinchu that Nde thought chewed cocoyam.'

(14) shows that a focused NP subject occurs post-verbally (in this case interverbally) rather than in the Spec of AGRsP position.

Another characteristic with the wh-in-situ construction is that the wh-phrase always has a scope over the matrix clause. Thus, if a wh-phrase appears in an embedded clause, it always has to move to the Spec of the highest CP at LF. The relevant examples are as follows:

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[3]For concrete examples, see Kural and Moritz (this volume).

[4]Kural and Moritz (this volume) tie this fact to the ECP.

[5]Notice that there seems to be a language-independent restriction that wh-phrases cannot be topicalized. For example, wh-words in Japanese cannot take the topic marker *-wa*. Wh-phrases with *-wa* receive only a contrastive interpretation. For this reason, it may be that the clausal subject in Nchufie is obligatorily topicalized, and that this causes the anomaly. It should be noted that I am not assuming the existence of independent Focus Phrase in Nchufie. Rather, focus position is negatively defined in the sense that focused elements cannot occupy the Spec of AGRsP. As for the similarity between focus and topic, Zubizarreta (1993) posits a functional projection in Spanish which could be realized either as Topic Phrase or as Focus Phrase.

(15) ɔ̀ zí njíɛ̰̀ pǐíncū wə̀
you know comp Piinchu who
'Who do you know that Piinchu likes?'

(16) ɔ̀ zí ŋɔ̀ á yā pǐíncū kwɛ̂
you know person det/op comp Piinchu like
'Do you know (the person) who Piinchu likes?'

(17) ɔ̀ ɣɛ̌ kə́ yā̂ pǐíncū nʃíɛ̃
you wonder what comp Piinchu N-break
'What do you wonder whether Piinchu broke?'[6]

(18) ǹ ɣɛ̌ nyò á yā̂ pǐíncū nʃíɛ̃
I wonder thing det/op comp Piinchu N-break
'I wonder what Piinchu broke.'

(19) ǹ ɣɛ̌ ŋɔ̄ á yā ǎ njū̂ zóo̰ sə́ū̀
I wonder person Op/det comp 3s N-eat yam det
'I wonder who ate the yam.'

(20) pǐíncū m͡bɛ́ɛ̀ wə̄ ŋɔ̄ á yā ǎ ŋ͡kū̂ zóo̰ sə́ū̀
Piinchu N-ask me person Op/det comp 3s N-chew yam det
'Piinchu asked me who chewed the yam.'

(21) pǐíncū m͡bɛ́ɛ̀ wə̄ nyǒ á yā kɛ́ɛ́ŋɔ̄ njū̂
Piinchu N-ask me thing Op/det comp Keengo N-eat
'Piinchu asked me what Keengo ate.'

(22) pǐíncū m͡bɛ́ɛ̀ wə̄ njíɛ̰̀ kɛ́ɛ́ŋɔ̄ ŋ͡kū̂ kə̂ zûŋ
Piinchu N-ask me comp Keengo N-chew what yesterday
'What did Piinchu ask you that Keengo chewed yesterday?'

Thus, whereas English verbs like *wonder* and *ask* subcategorize +wh CPs with either a wh-phrase in the Spec position or a +wh complementizer *whether* or *if* in the head position, corresponding verbs in Nchufie do not allow CP complements with overt wh-phrases in the Spec position.[7] Instead they take a complex NP, as shown in (16), (18), (19), (20), and (21). Now take (17). *kə* 'what' immediately following the verb ɣɛ̌ 'wonder' may appear to be in the Spec of CP subcategorized by the verb. In fact, as (18) shows, ɣɛ̌ takes an NP object, unlike its English counterpart, and *kə* simply occupies the

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[6]A more literal translation would be: 'What did you wonder about that Piinchu broke.' Compare (17) with the following ungrammatical sentence.

(i) *ɔ̀ ɣɛ̂ kɛ̄ pǐíncū nʃíɛ̃ kə́
you wonder whether Piinchu N-break what
'What do you wonder whether Piinchu broke?'

[7]This is admittedly only a descriptive generalization. It remains to be seen what type of principle(s) and/or parameter it can be derived from. As pointed out by Koopman (personal communication), some of the Nchufie verbs do take concealed questions as their complements, so there has to be a syntactic (rather than semantic) reason for the distribution of wh-phrases at S-structure in Nchufie (cf. Grimshaw 1979).
It seems that Nchufie has a +WH complementizer *kɛ̀*.

(i) ŋ̀ ká zǐ kɛ̀ pǐíncū ŋ͡ɡə́ū̀ n͡dɡɛ̂ pə̀
I neg know whether N-go home neg
'I don't know whether Piinchu went home.'

direct object position. Thus, the claim that wh-phrases are not in the Spec of CP at the time when SPELL-OUT applies holds in the case of (17) as well. Now look at the following sentence.

(23) ŋ̀ ká zǐ kɛ̂ pǐíncū ŋ͡gə́ʉ̀ n͡dgɛ̂ pə̀
I neg know how Piinchu N-go home neg
'I don't know how Piinchu went home.'

If wh-phrases do not occupy the Spec of CP position at SPELL-OUT, as I have argued, then *kɛ̂*, which I glossed as 'how,' cannot be a wh-word. I suggest that it is indeed a noun which means something like 'manner.' The problem with this suggestion is the fact that it is not followed by a complementizer *yɑ* or an overt operator in (23). However, since we do not know enough about complementation and relativization in Nchufie in general, the suggestion that *kɛ̂* is nominal rather than adverbial should remain as a viable possibility.

In sum, two rather unique syntactic properties of the garden-variety wh-in-situ construction in Nchufie have been pointed out: (i) The subject position of a clause cannot be occupied by a wh-phrase, and (ii) the wh-in-situ in an embedded clause necessarily takes the scope over the matrix clause. In the next section, I will discuss the clefting strategy.

2. Cleft Construction

A second way of asking wh-questions in Nchufie is to make use of the cleft construction. In the Nchufie cleft sentence, the copula is phonetically null in the present tense, but surfaces as *m͡bə* in the past tense.

(24) ɑ́ wə̀ yā ɑ̀ cuó ŋ͡kǎɑ̀
3s who comp 3s prog N-run
'Who is it that is running?'

(25) ɑ́ m͡bɑ̂ kə̀ yā n͡dɛ̌ njɔ̌ zūŋ
3s N-cop what comp Nde N-eat yesterday
'What was it that Nde ate yesterday?'

Informally, the structure of the cleft sentence is like the following:

(26) $[_{AGRsP}$ ɑ copula XP_i $[_{CP}$ Op_i $[_{C'}$ yɑ$]$ $[_{AGRsP}$ ....t_i ....$]]]$ (XP = DP, PP)

It should be emphasized here that wh-phrases occupy a base-generated position in the cleft construction. Therefore, this type of construction is also a case of wh-in-situ. The relation between the wh-phrase and the gap in the lower clause is mediated by an operator in the Spec of the CP immediately dominated by the clause containing the wh-phrase. In other words, a wh-phrase in the cleft construction does not move from the CP that follows the wh-phrase. Examples follow:

(27) á wə̀ yā à cuó nʉ̌ŋʉ́ pígì
3s who comp 3s prog (N-)dance(v) dance(n)
'Who is it that is dancing?'

(28) á pyɛ̌nɔ̀ pá̰ī mbɛ́ɛ̰̀ pá pó cūō ŋkǎà
3s AGR-which children man op they prog N-run
'Which boys are such that they are running?'

(29) á nyɛ̌nɔ̀ zóō̰ á yā pǐíncū njɔ̌ zūŋ
11s AGR-which yam Op/det comp Piinchu N-eat yesterday
'Which yam did Piinchu eat yesterday?'

(30) á wə̀ yā à njwà pʰìɛ́ mʉ̀ŋkì mbwéè
3s who comp 3s N-sing two pl-song for-3s
'Who is it that he sang two songs for?'

(31) àá mbùō wə̀ yâ á mfə̂ kɔ̄ŋ
3s to who comp 3s N-give bed
To whom is it that he gave a bed?

The above examples show that arguments of a verb and of a preposition can be clefted. When an object of a preposition is clefted, as in (30), a resumptive pronoun appears in place of a trace.[8] On the other hand, certain adverbial wh-phrases resist clefting.

(32) *á fə̀ yā pǐíncū ɣə̀ʉ̂
3s where comp Piinchu go
'Where does Piinchu go?'

(33) á nyɛ̌nɔ̀ yùṵ̄ fá yā pǐíncū ɣə̀ʉ̂
3s AGR-which place Op/det? comp Piinchu go
'Which place does Piinchu go?'

(34) *à lʉ́gʉ̀ yā pǐíncū ŋ͡gə̀ʉ́
3s how comp Piinchu N-go
'How did Piinchu go?'

(35) *à njǐɛ̰̀ yā pǐíncū ŋ͡gə̀ʉ́
3s why comp Piinchu N-go
'Why did Piinchu go?'

(36) á ndə̀ kə̄ yā àá ŋ͡gə̀ʉ̀
3s time what comp 3s N-go
'What time did s/he go?'

Judging from the data above, one could argue that referentiality may play a role in the grammaticality of clefting the adverbial wh-phrase, since only those that contain nominal elements such as *yùṵ̄* 'place', as in (33) and *ndə̀* 'time', as in (36) are

[8]The resumptive pronoun strategy raises an interesting question with respect to the Copy Theory of Movement in Chomsky (1992). Typically, the operator and the resumptive pronoun are not subjacent, and therefore, it is standardly assumed that movement is not involved for the resumptive pronoun strategy. This will (partially) explain why resumptive pronouns surface instead of the whole DP in a copy theory of movement.

grammatical.[9] I tentatively suggest that pure adverbials like *fə* 'where', *lɯ́gɯ̀* 'how' and *njìɛ̀* 'why' fail to receive a referential index in Nchufie, and thus cannot be linked to an operator via coindexation.

As for long-distance cleft wh-questions, it turns out that exactly the same subjacency effects as in 'wh-in-situ' questions are seen. This shows that LF-movement of wh-phrases and syntactic movement of operators are subject to the same bounding constraints. This is as is expected, since it is generally believed in the principles-and-parameters theory that relative clause operator movement is the same as wh-movement.[10] The examples in (37)-(40) show that successive cyclic syntactic operator movement is available in Nchufie, just like English and other languages.

(37) á wə̀ yā ɔ̀ kwə̰ə̰ njíɛ̀ pìíncū kwɛ̌
3s who comp you think comp Piinchu like
'Who is it that you think that Piinchu likes?'

(38) á wə̀ yā ɔ̀ kwə̰ə̰ njíɛ̀ à kwɛ̌ kɛ́ɛ́ŋɔ̄
3s who comp you think comp 3s like Keengo
'Who is it that you think likes Keengo?'

(39) á wə̀ yā n͡dɛ̌ njíɛ̀ ŋ͡gwɛ́tɑ́ī kwə̰ə̰ njíɛ̀ pìíncū kwɛ̌
3s who comp Nde N-say Ngwetai think comp Piinchu like
'Who did Nde say that Ngwetai thinks that Piinchu likes?'

(40) á wə̀ yā n͡dɛ̌ njíɛ̀ ŋ͡gwɛ́tɑ́ ŋ̀kwə̰ə̰ njíɛ̀ àá ŋ̀kwɛ̌ kɛ́ɛ́ŋɔ̄
3s who comp Nde N-say Ngwetai N-think comp 3s N-like Keengo
'Who did Nde say that Ngwetai thought liked Keengo?'

As is the case with 'wh-in-situ' questions, extraction out of islands generally yield ungrammatical results, except for argument extraction out of N Complement type. That N-Complement case of the complex NP condition (CNPC) does not show an island effect can be accounted for by the *Barriers* framework if we assume that the noun L-marks CP.[11] The fact that adjunction extraction is impossible—as shown in (44) and (45)—does not count against the claim that such nouns L-mark CP, since cleft sentences with nonreferential adverbial wh-phrases are ungrammatical even when they occur in simplex constructions, as was shown earlier by (32), (34), and (35)[12].

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[9]See Cinque (1990) and Rizzi (1990) for this point.

[10]See Chomsky (1977).

[11]See Chomsky (1986) 34-37.

[12]This, however, does not preclude one from (vacuously) adopting whatever account that explains the ungrammaticality of adjunct wh in situ in the N complement type complex NP.

Complex NP

N Complement Type

(41) á kə̀ yā ɔ̀ɔ́ njóò̰ mʉ̀làà njíɛ̰̀ pǐíncū njʉ̂
3s what comp you N-hear rumor comp Piinchu N-eat
'What is it that you heard the rumor that Piinchu ate?'

(42) á m͡būō wə̀ yā ɔ̀ɔ́ njóò̰ mʉ̀làà njíɛ̰̀ pǐíncū ŋfə̄ mútāŋ
3s to who comp you N-hear rumor comp Piinchu N-give sheep
'To whom is it that you heard the rumor that Piinchu gave a sheep?'

(43) á wə̀ yā ɔ̀ɔ́ njóò̰ mʉ̀làà njíɛ̰̀ àá njâ mû͡ŋ̍gû
3s who comp you N-hear rumor comp 3s N-steal chicken
'Who is it that you heard the rumor that s/he stole a chicken?'

(44) *á lʉ́gʉ̀ yā ɔ̀ɔ́ njōò̰ mʉ̀làà njíɛ̰̀ pǐíncū njàā ŋwaɛ̃
3s how comp you N-hear rumor comp Piinchu N-steal book
'How$_i$ is it that you heard the rumor that [Piinchu stole a book *t* $_i$]'

(45) *á njǐɛ̰̀ yā ɔ̀ɔ́ njōò̰ mʉ̀làà njíɛ̰̀ pǐíncū njàā ŋwaɛ̃
3s why comp you N-hear rumor comp Piinchu N-steal book
'Why$_i$ is it that you heard the rumor that [Piinchu stole a book *t* $_i$]'

Extraction out of a relative clause yields mixed results. There is at least one acceptable example, namely (46), that disobeys the CNPC. However, all the other examples are ungrammatical. There is a categorial difference between (46) and the others: the former has prepositional wh-phrase focused, while the latter have NP wh-phrases focused. I do not have a ready explanation for the apparent grammaticality of (46), but simply note that PP extraction out of relative clause type complex NP does not always lead to ungrammaticality.

Relative Clause

(46) àá́ m͡būō wə̀ yâ ɔ̀ɔ́ njəʉ̀ mútāŋ yâ màá ŋfə̄ là
3s to who comp you N-see sheep comp I N-give det
'To whom is it that you saw the sheep that I gave?'

(47) *á nyɛ̌nɔ̌ ŋɔ̃ á yā ɔ̀ɔ́ njəʉ̂ mɛ̀ á yā à ntûŋ
3s AGR-which person det/op comp you N-see child det comp 3s N-kick
'Which person did you see the child who kicked?'

(48) *á nyɛ̌nɔ̌ zóô á yā ɔ̀ɔ́ njəʉ̂ mɛ̀ á yā à n͡kʉ̂
3s AGR-which yam det/op comp you N-see child det comp 3s N-chew
'Which yam did you see the child who ate?'

Now look at the following sentence.

(49) àá́ m͡būō wə̀ yâ ɔ̀ɔ́ njəʉ̀ kɛ̄ màá m͡ŋfə̄ mútāŋ (là)
3s to who comp you N-see how I N-give sheep det
'To whom is it that you saw how I gave the sheep?'

If the above translation correctly reflects the Nchufie sentence, this sentence would show that extraction out of wh-islands does not (necessarily) result in weaker acceptability,

which would be a somewhat surprising result, since Nchufie seems to generally obey subjacency. However, I suggested in the first section the possibility that 'kɛ̂' is actually a noun meaning 'manner.' It is not at all obvious how this account might help explain the grammaticality of (49), since it is unlikely that 'kɛ̂' L-marks the following clause. I leave the problem open here.

Extraction out of adjunct clause yields ungrammatical sentences, as is expected. This is a typical Condition on Extraction Domains (CED) effect, proposed by Huang (1982).

Adjunct Clause

(50) *á wə̄ yā kɛɛ́ŋɔ̄ ncūō ŋɣə̌ɯ̀ ǹdgɛ̂ ndə̀ ā yā á njə̀ɯ ɛ̀
3s who comp Keengo N-prog N-go home time det comp 3s N-see her
'Who$_i$ is it that Keengo was going home when s/he$_i$ saw her?'

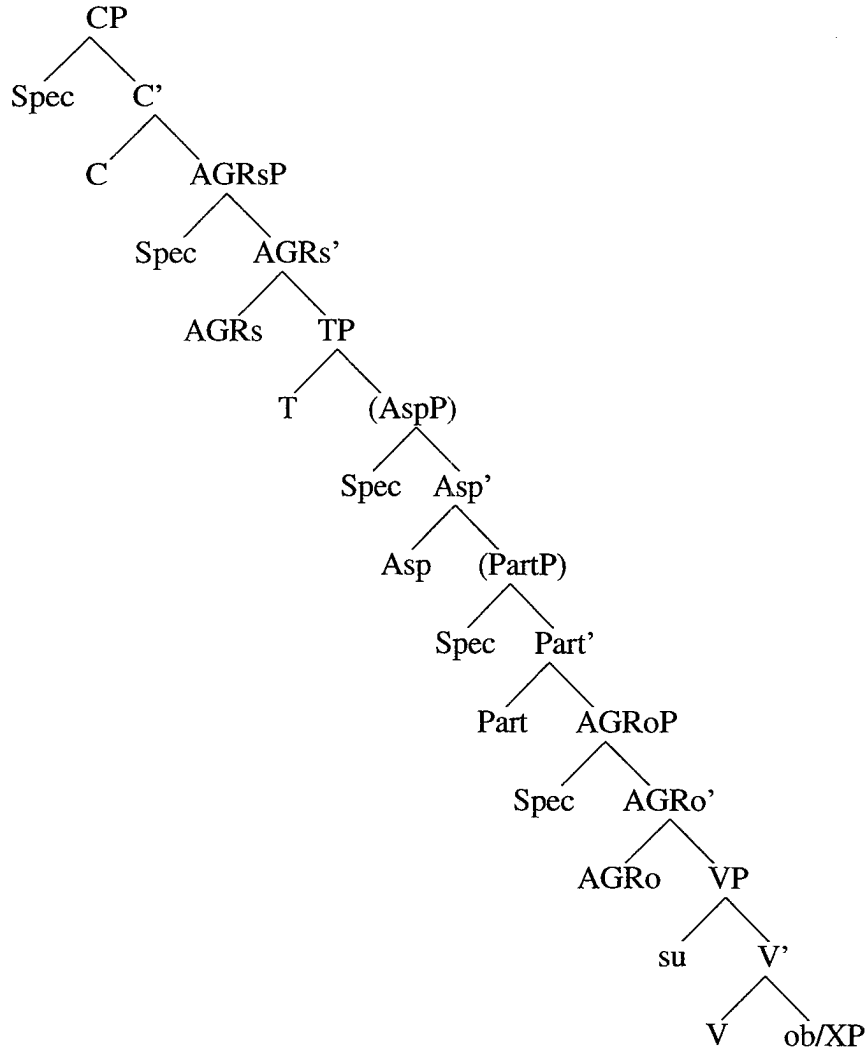
We have seen in this section that the clefting strategy of wh-question in Nchufie obeys Subjacency and that only referential expressions can license operator-variable relations via coindexation.

3. Post-Verbal Wh-Subject

3.1. Analysis

I will now present an analysis of Nchufie verb doubling in this section. I will assume that the clause structure of Nchufie is as in (52), which I will justify later:

(51)



Maximal projections in parentheses, namely, Asp(ect) P(hrase) and Part(iciple) P(hrase), can be absent, depending upon the structure of the sentence. Because it is nonfocal in Nchufie, the subject position cannot be occupied by wh-elements (or a focused element) at the time SPELL-OUT applies. The Extended Projection Principle forces the Spec of AGRsP to be filled by an expletive *a*.. The wh-phrase remains in its VP-internal base-generated position, namely the Spec of the VP.[14] The expletive and the wh-phrase form a chain, or CHAIN in the sense used in Chomsky (1986), where the expletive, which is the head of the CHAIN, is in a position where Case can be checked and the wh-phrase, which is the tail, is θ-marked. The wh-phrase replaces the resumptive pronoun[15] and then undergoes Quantifier Raising at LF. I assume that, in Nchufie, verbs do not stay in their

[14]Notice that this is a very strong piece of empirical evidence for the VP-Internal Subject Hypothesis.

[15]Alternatively, one can adopt Chomsky's (1991) position according to which the expletive is an LF-affix, to which its associate wh-subject adjoins at LF. I believe that our account of verb doubling does not hinge on the choice between the two hypotheses.

base-generated position but move up to a higher functional head. In the Minimalist Theory, the obligatory nature of the verb movement is forced by the strong V-features in AGRs and/or T.[16] This explains the fact that the wh-subject follows the verb in this construction. When there is an auxiliary verb, both the auxiliary verb and the main verb precede the wh-subject. This indicates that, even when there is an auxiliary verb, a main verb moves out of the VP and goes adjoins at least to AGRo.

(52) à cúo ndìè wə̌
3g prog N-sleep who
'Who is sleeping?'

In simple cases such as (5) (=repeated here as (53)) that involve intransitive verbs (including both unergative and unaccusative verbs), verb doubling does not takes place. Verb doubling is obligatory when the verb is a transitive verb taking a DP object.

(53) à ɣwɛ̀ wə̀
3s laugh who
'Who is laughing?'

(54) àá njəɯ nyɛ̌nɔ̀ ŋɔ̀ njəɯ ɛ̀ ndə̀ à yá àá ncúò ŋɣə̌ɯ̀ ǹdgɛ̂ là
3s N-see AGR-which person N-see her time det/op cmp 3s N-prog N-see home det
'Which person saw her when she was going home?'

(55) à ʒɯ̂ wə̀ ǹjɯ̂ mákàpù
3s eat who N-eat cocoyam
'Who is eating a cocoyam?'

(56) àá njwà wə̀ njwá pʰìé mɯ̀ŋk̀ì mbwɔ̀ kɛ́ɛ́ŋɔ̄
3s N-sing who N-sing two pl-song for Keengo
'Who sang two songs for Keengo?'

The fact that verb doubling is obligatory with transitive verbs with DP objects strongly suggests that a Case-theoretic account should be given to verb doubling. I assume that Accusative Case is checked by the combination of both AGRo and transitive verb when the object DP occupies the Spec of AGRoP. When Case checking takes place, the transitive verb must have adjoined to the AGRo, thus activating the Case checking potential that AGRo possesses. In addition, I crucially assume the following condition.

(57) Locality Condition on the Accusative DPs

Unless the Accusatively Case-marked DP is in the Spec of AGRoP at SPELL-OUT, a transitive verb in its base-generated position and the Accusatively Case-

[16]If the V-features of AGRs are weak, the verb moves up to the T position in syntax, on the assumption that the V-features of T are strong. What is crucial to the analysis in this paper is that tensed verbs move higher than AGRo in syntax.

marked DP must be in a strictly local relation[17,18]—either the Spec-head relation or head-complement relation—at SPELL-OUT.

Simply put, being in the Spec of AGRoP is a sufficient condition for the Accusative DP to be licensed Case-theoretically in overt syntax, and if the DP is not already there at SPELL-OUT, it must be sufficiently close to the transitive verb at SPELL-OUT so that it can reach the Spec of AGRoP.[19] I argue that verb doubling is caused by the inability of the verbal trace to enter into the relevant local relation in Nchufie.[20]

When a verb takes a CP complement, verb doubling may or may not take place.

(58) à zí wə̄ njíɛ̰̀ kɛ́ɛŋɔ̄ njɔ̌ m̄àŋ mʉ́tāī
3s know who comp Keengo N-buy sheep market
'Who knows that Keengo bought a sheep from the market?'

(59) à zí wə̄ njí njíɛ̰̀ kɛ́ɛŋɔ̄ njɔ̌ m̄àŋ mʉ́tāī
3s know who N-know comp Keengo N-buy sheep market
'Who knows that Keengo bought a sheep from the market?'

I propose that the apparent optionality of verb doubling with transitive verbs taking a CP complement is due to the fact that a CP complement can optionally be linked to a phonetically null expletive pronoun.[21, 22] In (58), in which verb doubling does not take place, the CP complement is in its base-generated position. Since CPs in general do not require Case, the verb 'know' in (58) can move up to functional heads without violating the locality requirement on the Accusative DPs (15). As for (59), a phonetically null expletive

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[17]In essence, this is identical in spirit to the Case Adjacency Condition in Stowell (1981).

[18]This condition is trivially satisfied in simple cases in which transitive verbs take DP direct objects. In (i), on the other hand, DP *John* is neither in a position where Case-checking takes place nor in its base-generated position. If the DP *John* stayed in its base-generated position, as in (ii), it would not be able to undergo a further movement to the Spec of AGRo at LF, because it violates the locality requirement.

(i) Mary believes John$_i$ to be [$_{AP}$ t$_i$ stupid].

(ii) *Mary believes to be John stupid.

[19]As it is, this requirement is no more than a descriptive statement. It should follow from some independently motivated principles of UG. I leave this problem open.

[20]This is essentially the same type of argument given in Koopman (1992), where Bambara is argued to be a - Case Chain language. According to Koopman (ibid.), in Bambara, a verb that does not assign Case raises to I, but a verb that assigns Case remains in its base-generated position, with a dummy element inserted to bear the inflectional affix. Koopman (ibid.) accounts for the contrast by assuming that Bambara does not have Case chains ([-CC]). To put it simply, the verbal trace in [-CC] languages fails to assign Case to its object DP. Therefore, even if intransitive verbs can raise to a higher functional head, transitive verbs taking DP objects cannot raise. It is clear that, although I have adopted a slightly different assumption about Case-assignment/checking, her account could in principle be directly carried over to verb doubling in Nchufie.

[21]For a similar silent expletive *pro* in Hindi, see Srivastav (1991).

[22]Nchufie does not seem to be a pro-drop language. Therefore, the null expletive must be different from *pro* found in pro-drop languages.

is base-generated in the complement position of the matrix verb and the expletive is linked to the CP adjunct via coindexation. Since the expletive is nominal, it has to satisfy (57), thus inducing verb doubling.

In (60), the element that appears after the copy of the verb is arguably not an argument of the verb 'walk,' but verb doubling is possible, while (61), which looks similar in relevant respects, does not induce verb doubling.

(60) à nǐŋ wə̀ nǐŋ tʰúṵ̀
3s walk who (N-)walk night
'Who is walking in the night?'

(61) à nǐŋ wə̀ ǹdgɛ́
3s walk who house
'Who is walking in the house?'

I speculate that *tʰúṵ̀* 'night' in (60) is a DP object that is subject to the locality requirement (57), whereas *ǹdgɛ́* 'house' is a PP headed by a P made up of tones only. Compare the following two English sentences.

(62) They are walking along the beach.

(63) They are walking the beach.

The same verb *walk* can take both PP and DP. That *the beach* in (63) is not a PP headed by an empty P can be shown by (64), where a DP and a PP occur simultaneously.

(64) They are walking the streets on Santa Monica.

Therefore, I tentatively assume that optional verb doubling in (60)-(61) can be given a Case-theoretic account as well. The fact that verb doubling is impossible when there is only a PP whose head has segmental content seems to suggest that our account is on the right track.

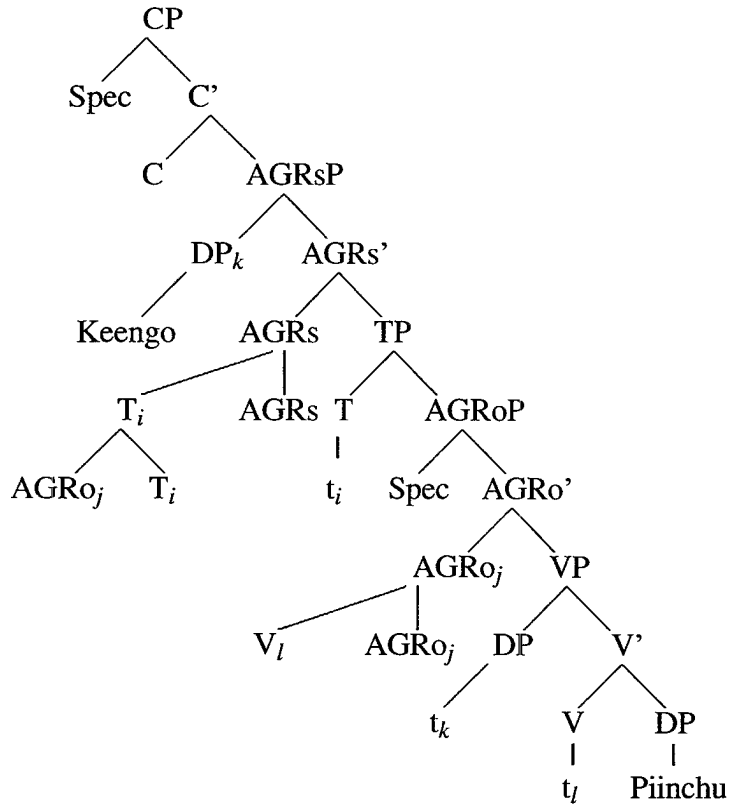
3.2. The Position of the Tensed Verb in Nchufie.

I have assumed that finite verbs must raise overtly in syntax in Nchufie. That explains the existence of the finite verb preceding the wh-subject. I have also argued that verb doubling takes place because the verbal trace in Nchufie fails to enter into the locality condition (57) with a DP object. Then a question immediately arises as to where the finite verb and the object are in simple transitive sentences such as the following:

(65) kɛ́ɛŋɔ̀ ntūŋ piincù
Keengo N-kick Piinchu
'Keengo kicked Piinchu.'

If the finite verbs have adjoined to AGRs[23] and the object DPs remain in situ in (65), then the object DP is governed only by a verbal trace, as in (66), thus violating (15).

(66)



Therefore, we must assume that the DP object is in the Spec of AGRoP at SPELL-OUT in (65).[24] Otherwise, we would expect verb doubling in simple transitive cases, since the verbal trace in Nchufie cannot license the DP object. The prediction that verb doubling takes place in simple transitive cases, however, is not borne out.

(67) *kɛ́ɛŋɔ̀ ntūŋ ntūŋ piincù
Keengo N-kick N-kick Piinchu
'Keengo kicked Piinchu.'

In (67), the first *ntūŋ* 'kicked' is adjoined to the AGRs position, while the second *ntūŋ* 'N-kick' is in its base-generated position.

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[23]Needless to say, V does not simply adjoin to AGRs. First, it adjoins to AGRo, and then the complex AGRo made up of V and AGRo adjoins to T, and then the complex T made up of T and the complex AGRo adjoins to AGRs.

[24]Notice that being in the Spec of AGRoP is a sufficient condition for the DP object to be licensed. Therefore, whether Nchufie is [- Case Chain] language or not is irrelevant so long as the object occupies the Spec of AGRoP.

Now we will see examples with aspectual auxiliary verbs.

(68) à cúò njū́ mákàpù
3s prog N-eat cocoyam
'S/he is eating a cocoyam.'

(69) pó káà nīŋ ɲɔ̂ʒū
they perf cook food
'They have cooked food.'

In (68)-(69), it is the aspectual auxiliary verbs that bear tense specifications. This means that they are the ones that occupy the Spec of AGRsP. Then where are the main verbs in (68)-(69) at SPELL-OUT? The progressive auxiliary *cuo* subcategorizes for an N-form verb, and the perfective auxiliary *kaa* subcategorizes for what looks like a verbal stem. In both cases, the following verbs are associated with specific tonal patterns. Therefore, even in the perfective sentences, the aspectual verb *ka* does not simply select a verb stem, but instead subcategorizes for a verb in a certain 'morphological' form. It seems that much inflectional morphology has been given a syntactically derivational account in the principles-and-parameters theory. If this approach is on the right track, it is natural to assume that head movement is involved in *all* verbal inflection. Therefore, I propose that the progressive auxiliary *cuo* and the perfective auxiliary *ka* select for a Participle Phrase[25], which in turn selects for AGRoP, and that the main verbs adjoin to the head of PartP at SPELL-OUT. This accounts for the fact that main verbs precede the object DPs in the Spec of AGRoP. If the auxiliary verbs simply select for AGRoP, we would expect the DP object to precede the main verb, because the DP is in the Spec of AGRoP at SPELL-OUT.

The above account straightforwardly explains why verb doubling is absent in simple transitive sentences. It might appear as if we could also explain why (70) is ungrammatical.

(70) *à cúo mákàpù ǹjū́ wə̄ (ǹjū́)
3s prog cocoyam N-eat who N-eat
'Who is eating a cocoyam?'

That is, one might say that (70) is bad because *mákàpù* 'cocoyam,' which should be in the Spec of AGRoP *precedes* the pre-wh-subject *ǹjū́* 'eating,' which is adjoined to the head of PartP. However, we still have the question to answer as to why (71) is ungrammatical. After all, if the object DP is in the Spec of AGRoP and the main verb is adjoined to the head of PartP, we should expect sentences like (71) to be grammatical. The structure of (71) would be as in (72).

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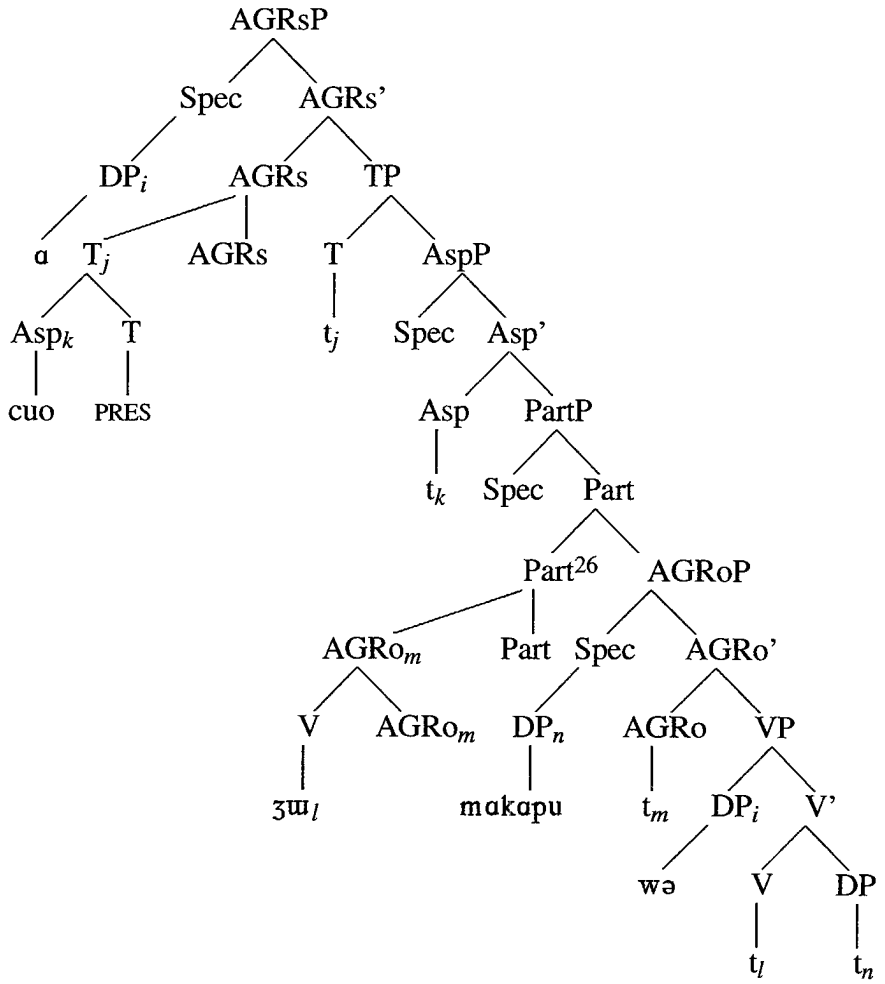
[25]I do not place too much emphasis on the particular choice of the terminology. I have chosen the term 'Participle Phrase' simply because corresponding English auxiliaries select for participial forms.

(71) *à cúo ǹjɯ̂ mákàpù wə̀ (ǹjɯ̂)
3s prog N-eat cocoyam who N-eat
'Who is eating a cocoyam?'

(72)



It seems as if the existence of the VP-internal subject in the Spec of VP somehow blocks the (A-bar) movement of the object DP: The DP object cannot move out of VP until the DP subject has moved out of the VP.[27,28]

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[26]It appears as if the 'N-prefix' is (at least part of) the head of PartP, but I assume that [V-AGRo]-Part merger in this case is spelled out as the N-form of the verb. Therefore, I adjoined the verb to the left of the head of PartP.

[27]I leave the question of how to formalize this open for further research. The restriction in Nchufie that an object cannot move out of the VP via A-movement might be related to the fact that Nchufie is a non-scrambling language.

[28]This condition seems to be absent for the indirect passive of the English double object construction if Larson's (1988) analysis is correct. For him, the dative alternation is similar to Passivization applied within the VP, and the direct object (which bears the θ-role of Theme) behaves like a 'subject.' According to Larson (1988, pp. 362-364), the indirect DP bearing the θ-role of recipient moves to the subject position of a clause over the direct DP.

3.3. Verb Doubling and the Copy Theory of Movement.

One of the fundamental questions about verb doubling is the nature of the copying process. A straightforward answer can be given to this question if one adopts the Copy Theory of Movement proposed in the Minimalist Theory. There, Move α is conceived as a process of copy (followed by deletion). This reanalysis of movement was necessitated in part to account for reconstruction effects in a theory that eliminates the independent syntactic levels of D-structure and S-structure. In other words, the Copy Theory of Movement is motivated by a theory-internal reason, namely, to explain certain A'-movement phenomena within the Minimalist Theory. One might wonder whether A-movement and head movement should be treated the same way. The null hypothesis is that movement as copy and deletion applies to A-movement and head movement as well. Verb doubling in Nchufie provides direct evidence for the Copy Theory of Movement. Normally, copies of movement have been deleted at PF. However, it is not necessary for deletion of copies to take place in order for the PF to converge. In this regard, Chomsky (1992, p.37) writes:

> Consider a representation π at PF. PF is a representation in universal phonetics, with no indication of syntactic elements or relations among them . . . . To be interpreted by the performance system A-I, π must be constituted entirely of legitimate PF objects, that is, elements that have a uniform, language-independent interpretation at the interface.

It is clear that copies of the moved elements are legitimate PF objects. Therefore, deletion of copies is a process independent of PF convergence and potentially, a representation π with undeleted copies *can* converge at PF. Thus, verb doubling in Nchufie provides strong empirical evidence for the Copy Theory of Movement.[29]

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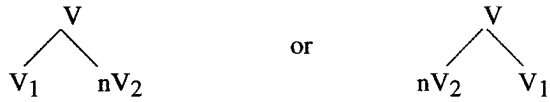
[29]Hilda Koopman (personal communication) notes that V reduplication is a widely attested morphological process best described derivationally in some African languages and suggests the possibility that the source of verb doubling is a reduplicated V, with V_1 excorporating to pick up V-features.

(i)



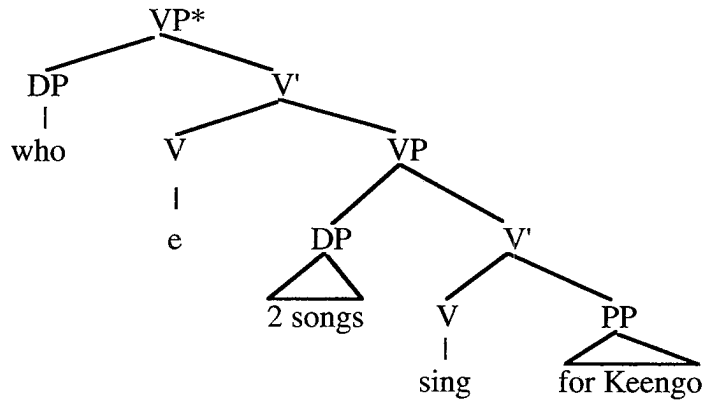
I believe that there are several problems with this analysis. First, 'N-form' is a form independently attested outside of verb doubling, and if all inflectional morphological distinctions must be licensed by some functional head, there must be a functional projection--call it N-Phrase--that dominates a VP. Reduplication as a derivational process does not involve maximal categories. Secondly, there is a fairly productive verb reduplication in Nchufie, but such reduplicated forms are results of total reduplication and do not contain the N-form.

Now notice the following sentence (73). Verb doubling does not take place when a verb is followed by a PP. (The preposition is in boldface.)

(73) àá́ njwà wə̀ njwá pʰìɛ́ mʉ̀ŋ̩kǐ **m̩bwɔ̌** kɛ́ɛ́ŋɔ̄
3s N-sing who N-sing two pl-song for Keengo
'Who sang two songs for Keengo?'

Chomsky (1992) assumes the VP-shell analysis, first proposed by Larson (1988). In Larsonian terms, the VP for (73) would roughly take the following form.

(74)



In the above tree structure, the verb 'sing' is inserted in the lower VP and moves to a V^0 position in the higher VP* via head movement. If the structure in (74) is correct, one might expect it to have two verbal copies rather than one inside the VP*. But this is not the case, as the sentence (73) shows. Moreover, if a finite verb in Nchufie ends up adjoining to the AGRs in overt syntax in Nchufie, passing through at least T and AGRo, as I have assumed, one might argue that the analysis given in this paper predicts the existence of at least three verbal copies. However, this does not automatically count as counterevidence to the claim that movement involves copy and deletion. On the contrary, copies of movement can generally remain undeleted in overt syntax, and their deletion takes place both at PF and LF independently. Otherwise, one cannot explain the fact that the reflexive in (75) may refer to *Bill* in the Minimalist theory.

(75) John wondered which picture of himself Bill saw.

(ii) àá́ ntɔ̄ nɔ̄ zá zà
3s N-try to cry cry
'S/he tried to cry.'

(iii) pó ɣɛ̀ nɔ̀ líɛ lìɛ̀ɛ
they have to sleep sleep
'They have to sleep.'

At PF, the copy of the movement has been deleted, but for the interpretation of (75) to converge at LF, part of the DP *which picture of herself* must be present at its base-generated position *at LF*, since, according to Chomsky (ibid., p. 54), the two possible LF representations of (75) will be something like the following (Chomsky's (38)):

(76) (i) John wondered [[which picture of himself]$_{[wh\text{-}\ t]}$] [Bill saw [[which picture of himself][*wh- t*]]]

(ii) John wondered [which [*wh- t* picture of himself]][Bill saw [which [*wh- t* picture of himself]]]

Suppose, then, that there is a universal principle or convention that requires that copies of movement be deleted at PF irrespective of LF interpretation unless required by some other principle. In the case of Nchufie verb doubling, the locality requirement on accusative DPs (57) and the assumption that an object cannot move out of VP over the in-situ subject serve as the relevant factors that force the crucial copy to remain undeleted at PF. Then, (61) merely shows that PPs whose heads have segmental content (instead of simply tones) do not require licensing by the verbal copy. SPELL-OUT can apply freely throughout the derivation as long as PF representations converge. Thus, (61) is compatible with the claim that movement should be reanalyzed as involving copy and deletion.

3.4. Verb Doubling and the Checking Theory.

I have shown above that verb doubling in Nchufie provides direct support for the Copy Theory of Movement proposed in the Minimalist Theory. However, another aspect of verb doubling provides evidence *against* the Checking Theory, also proposed in the Minimalist Theory. There, in order to disallow lowering of functional heads (i.e., traditional affix-hopping) in languages like English, Chomsky (ibid. p.39) assumes that a lexical element α has 'inflectional features in the lexicon as an intrinsic property (in the spirit of lexicalist phonology); these features are then checked against the inflectional element I in the complex [α I].' One of the consequences of the Checking Theory is that words are inserted as fully inflected forms. In this theory, a verb in the bare uninflected form does not pick up various agreement and tense features as it adjoins to the various functional heads via V-movement during the derivation. Therefore, the Checking Theory predicts that, if any copies remain undeleted at PF, they should bear inflectional morphemes that are the same as those borne by the moved elements that head chains. However, this prediction is not borne out in verb doubling in Nchufie. The head of the chain takes the tense specification (unless there is a pre-verbal aspectual auxiliary verb such as *cuo* which bears tense) whereas the copy always takes what is called 'N-form' in this paper. In (55), the first occurrence of the verb *ʒɯ* 'eat' is a present tense form with a

present tense tone, and the second occurrence is an N-form. In (56), both pre-subject and post-subject verbal forms take the N-forms, but this is because the first verbal form is in the past tense, which requires that the verb be in the N-form.

(55) à ʒɯ̂ wə̀ ǹjɯ̂ mákàpù
3s eat who N-eat cocoyam
'Who is eating a cocoyam?'

(56) àá njwà wə̀ njwá pʰìɛ́ mɯ̀ŋ̩kǐ m̩bwɔ̌ kɛ́ɛ́ŋɔ̄
3s N-sing who N-sing two pl-song for Keengo
'Who sang two songs for Keengo?'

At this point, it is useful to examine distribution of N-forms. N-forms are required at least in the following contexts among others:

(77) a. Past tense
b. Future Tense
c. Progressive with *cuo*

On the other hand, N-forms are not employed in the following constructions.

(78) a. Present Tense
b. Perfective with *ka*

I assume that the past tense and the future tense markers are each made up of a specific tonal template which selects N-forms. The present tense, on the other hand, is associated with a tonal template that does not select N-forms. The progressive auxiliary verb *cuo* selects N-forms while the perfective auxiliary verb *ka* does not. I assume, without empirical argument, that verbs in the bare form cannot surface unless they are associated with a particular tone, by being associated with a tonal template either for tense (e.g. present tense) or an auxiliary verb. Otherwise, N-forms must be employed to satisfy the Minimal Word requirement. This account is clearly incompatible with the Theory of Feature Checking.

Another potential problem with the Checking Theory has to do with the strength of the V-features in Nchufie. Judging from the post-verbal wh-subject construction, it is clear that verbs raise overtly before SPELL-OUT in Nchufie. Therefore, the theory requires that the V-features of AGR are strong in Nchufie.[30] (Cf. Chomsky (ibid., pp. 42-43)) However, there does not seem to be any person agreement in Nchufie, which makes the agreement system of Nchufie even more meager than that of English, which does have the third person singular agreement different from the others in the present indicative. Thus,

[30]Notice that Nchufie and languages of the Kru family discussed in Koopman (1984) are counterexamples to the claim Pollock (1989, for example) that there is a significant correlation between the richness of the agreement system and the position that verbs occupy at SPELL-OUT. See also the following footnote.

lacking a clear criterion for what counts as the necessary morphological distinction, the claim that the V-features of Nchufie are strong is circular.[31],[32] There is a related problem: Suppose that the N-features of AGRo are strong, as I have been assuming in this paper. This forces the movement of object DP to the Spec of AGRoP at SPELL-OUT. But when the verb doubling takes place, the object must stay in situ, unable to move over the in-situ subject. This means the 'strong' N-features, which are illegitimate objects at PF, are visible at LF, which causes the derivation to crash.

In conclusion, I have analyzed verb doubling in Nchufie in the spirit of the Minimalist Theory in this section. The proper analysis of the construction necessitates positing several functional projections, thus giving support to the Split Infl Hypothesis. Theories such as Generalized Phrase Structure Grammar and Head-driven Phrase Structure Grammar, in which morphological information is usually encoded in the form of features, therefore, must come up with a different analysis of verb doubling, but it seems to be no easy task to do so in these frameworks.

I have also noted that verb doubling provides direct empirical evidence *for* the Copy Theory of Movement and *against* the Checking Theory, both proposed in the Minimalist Theory.

REFERENCES

Bobaljik, J. D. and D. E. Jonas. 1993. 'Subject Positions and the Role of TP,' *GLOW Newsletter* 30.

Cinque, G. 1990. *Types of A'-Dependencies,* MIT Press.

Chomsky, N. 1977. 'On Wh-Movement,' in Formal Syntax (eds.) P. Culicover, T. Wasow, & A. Akmajian, Academic Press. 71-132.

_____. 1986. *Barriers,* The MIT Press.

_____. 1991. 'Some Notes on Economy of Derivation and Representation,' in R. Freidin (ed.) *Principles and Parameters in Comparative Grammar,* 417-454, MIT Press.

_____. 1992. 'A Minimalist Program for Linguistic Theory,' *MIT Occasional Papers in Linguistics* No. 1.

[31]In footnote 4, Chomsky (1992) says, 'Note that while the intuition underlying proposals to restrict variation to elements of morphology is clear enough, it would be no trivial matter to make it explicit.... An effort to address this problem in any general way would seem premature.' For an attempt to link syntactic behavior of functional categories with morphology, see, for example, Bobaljik and Jonas (1993)

[32]Nchufie does have a tense distinction, and one might argue that it is the strong V-features of T that force verb movement in overt syntax. However, many languages that lack 'rich agreement system' do have overt tense distinction, but some of them (including English) do not have verb raising in overt syntax.

Grimshaw, J. 1979. 'Complement Selection and the Lexicon,' LI 10.2. 279-326.

Huang, C.-T. J. 1982. *Logical Relations in Chinese and the Theory of Grammar,* Ph.D. diss. MIT.

Koopman, H. 1984. *The Syntax of Verbs,* Foris.

_____. 1992. 'On the Absence of Case Chains in Bambara,' *Natural Language & Linguistic Theory* 10: 555-594.

Kural, M. and L. Moritz. This volume. 'Nchufie: Wh-in-situ & Locality'.

Larson, R, K. 1988. 'On the Double Object Construction,' *Linguistic Inquiry* 19, 335-91.

Pollock, J. Y. 1989. 'Verb movement, Universal Grammar, and the Structure of IP. *Linguistic Inquiry* 20: 365-424.

Rizzi, L.1990. *Relativized Minimality,* The MIT Press.

Sano, T. 1992. Elicitation handouts. UCLA.

_____. This volume. 'Resumptive Pronouns in Nchufie, the ECP, and the Least-Effort Condition'.

Stowell, T. 1981. *The Origins of Phrase Structure.* Ph.D. diss. MIT.

Srivastav, V. 1991. 'Subjacency Effects at LF: The Case of Hindi *Wh,*' *Linguistic Inquiry* 22: 762-769.

Watanabe, A. 1991. 'Wh-in-situ, Subjacency, and Chain Formation,' ms, MIT.

_____. 1992. 'Subjacency and S-Structure Movement of *WH*-in-situ,' *Journal of East Asian Linguistics* Vol. 1 No. 3, 255-291.

Zubizarreta, M. L. 1993. 'Fronting in Spanish,' talk given at UCLA on March 19, 1993.

NCHUFIE WH IN SITU AND LOCALITY*

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0. Introduction

This paper studies the WH in-situ construction of Nchufie and argues that WH movement in this language obeys subjacency at LF. Specifically, we will show that WH phrases cannot move at LF from relative clauses, WH Islands, or Adjunct Islands and that the only possible case of long distance WH movement from any kind of an island involves the movement of argument WH phrases from inside object position CNPs.

It has been argued in the literature (beginning we believe, with Aoun, Hornstein, and Sportiche 1981 who elaborate on an idea by Chomsky 1973) that, in languages that display WH in situ phenomena, Move α is operative at the level of Logical Form. Huang (1982) further argued the same point, and in order to account for asymmetries between LF WH movement and its syntactic counterpart, determined that subjacency did not constrain movement operations at the level of Logical Form. The issue was taken up by Choe (1984), Nishigauchi (1984, 1986) and Pesetsky (1987): these authors claim that subjacency does hold at LF and that a process of Pied-Piping is responsible for the lesser locality of LF movement. The Nchufie data that we gathered suggests that the latter view is the correct one, at least in so far as the syntax of Nchufie WH in situ is concerned. The particular instantiation of LF Pied-Piping that we will use is the one proposed in Moritz and Valois (to appear) for French sentential negation, in which pied-piping is constrained by Spec-Head Agreement. Given that LF processes are invisible to the language learner, they should belong to Universal Grammar. Therefore, if subjacency holds at LF in Nchufie, it should also hold in a language like Chinese, contra Huang (1982). In this paper however, we will limit ourselves to the facts of Nchufie and leave the issues raised by the Chinese data to another work.

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* We wish to thank our consultant, Sophie Ajeakwa for her patience and countless efforts to explain to us the meaning of the sentences that we tried to elicit from her over the weeks. Thanks also to the participants of the Field Methods 1991-1992 class at UCLA, which organized under the guidance of Hilda Koopman. Our knowledge of Nchufie would have been much less without their contributions.

1. Main Clause WH-Questions

Main clause WH questions can be formed in variuos ways in Nchufie, most notably by clefting the WH phrase, or leaving it in situ (see Nakamura, this volume). The strategy that we are interested in here is the latter, WH in situ. It can be seen in the examples below that objects and adjuncts can be questioned by leaving the relevant WH phrase in its D-structure position.

(1) piincu kwɛ wə
P. likes who
`Who does Pinchu like?'

(2) piincu ɣəɯ fą / kə yuu
P. goes where what place
'Where does Pinchu go?'

(3) piincu ŋgəɯ ŋdə kə
P. went time what
'When did Pinchu go?'

(4) piincu ngəɯ (saɑ)ləgə
P. went how
'How did Pinchu go?'

(5) piincu ŋgəɯ njiɛ̰
P. went why
'Why did Pinchu go?'

However, this strategy is not available for subject WH phrases, which must either be clefted, as in (6a), or else the verb must be doubled, as in (6c) (Nakamura, this volume).

(6) a. ɑ wə yɑ ɑ kwɛ piincu
expl who compl res.pr. like P.
'Who likes Pinchu?'

b. *wə kwɛ piincu
who likes P.

c. ɑ kwɛ wə ŋkwɛ piincu
expl likes who like P.

2. WH-Phrases in Complement Clauses[1]

WH phrases can be extracted from complement clauses at LF in Nchufie.

[1] Nchufie does not have sentential subjects, hence their absence in this work. The only way clauses can appear in the subject position in this language is if they are embedded under NPs, i.e., if they appear as subject Complex Noun Phrases.

(7) ɔ̀ kwaa njiɛ̂ wə̀ kwɛ̌ pǐncū
you think that who like P.
'Who do you think likes Pinchu?'

(8) ɔ̀ kwaa njiɛ̂ pǐncū kwɛ̌ wə̀
you think that like who
'Who do you think that Pinchu likes?'

(9) ɔ̀ kwaa njiɛ̂ piincu ŋgəɯ ŋdə kə
you think that P. went time what
'When do you think that Pinchu went?'

(10) ɔ̀ kwaa njiɛ̂ piincu ngəɯ (sɑɑ)ləgə
you think that P. went how
'How do you think that Pinchu went?'

(11) ɔ̀ kwaa njiɛ̂ piincu ŋgəɯ njiɛ̰
you think that P. went why
'Why do you think that Pinchu went?'

3. CNPC in Nchufie: The Noun-Complement Type

It is well-known that a Complex Noun Phrase (CNP) acts as an opaque domain for extraction in a language like English that displays WH movement in the syntax. Thus, (12), an instance of the Noun-Complement case of the CNPC, is ungrammatical because the movement has occurred from a position buried inside the sentential complement of the head Noun:

(12) *Who did you hear [$_{NP}$ the claim [$_{CP}$ that Mary likes t]] ?

In Nchufie, the facts are the following.

3.1. CNPs in Object Position

When the CNP is itself the object of a transitive verb, the subject and object of the complement clause can be extracted as in (13) and (14) respectively. However, adjuncts cannot escape the CNP, as (15) and (16) show respectively for a manner adverbial and a reason adverbial WH.[2]

(13) ɔ̀ɔ́ njōò̰ mɯ̀lɑ̀ɑ̀ njiɛ̰̂ pǐ́ncū njɑ̀ɑ̄ kə̄ [3]
you+SH heard rumor that P. stole what
'What did you hear the rumor that Pinchu stole t?'[4]

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[2] Throughout this paper, we will be concerned only with the lower clause construal of adjunct WH phrases.

[3] Our transcriptions use the conventions of the International Phonetics Association (IPA), except for two sounds: the 'j' glide is transcribed as 'y' and the affricate 'ʤ' is transcribed as 'j'.

[4] Nchufie is an SVO tone language. We realize that the tones are not complete in the examples. However, we found that tonal alternations do not have any bearing on WH movement. Therefore, given the time

(14) ɔ̀ɔ́ njōò̰ mɯ̀làà njiɛ̰̂ wə́ njàā ŋwaɛ
you+SH heard rumor that who stole book
'Who did you hear the rumor that t stole a book?'

(15) *ɔ̀ɔ́ njōò̰ mɯ̀làà njiɛ̰̂ pìí ncū njàā ŋwaɛ saaləgə
you+SH heard rumor that P. stole book *how*
'How did you hear the rumor that [Pinchu stole a book t]?' [5]

(16) *ɔ̀ɔ́ njōò̰ mɯ̀làà njiɛ̰̂ pìí ncū njàā ŋwaɛ njiɛ̰
you+SH heard rumor that P. stole book *why*
'Whay did you hear the rumor that [Pinchu stole a book t]?'

Examples (13) to (16) show an interesting contrast between arguments and adjuncts which we will come back to in the analytical part of the paper.

3.2. CNPs in Subject Position

Extraction out of a subject CNP in Nchufie yields ungrammaticality both with arguments, (17), and (18), and with adjuncts, (19), (20), and (21).

(17) *mɯ̀làà njiɛ̰ pìí ncū nʃíɛ̀ kə́ nkʰiɛ̰ kɛɛŋɔ
rumor that P. N+break *what* N+bother K.
'What did [the rumor [that Pinchu broke t]] bother Kengo?'

(18) *mulaa njiɛ̰ wə nʃíɛ ndugɔ (la) nkʰiɛ̰ kɛɛŋɔ
gossip that *who* broke glass det bothered K.
'Who did [the rumor [that t broke the glass]] bother Kengo?'

(19) *mɯ̀làà njiɛ̰ pìí ncū nʃíɛ̀ ndūgɔ̀ lá fə nkʰiɛ̰ kɛɛŋɔ[6]
gossip that P. N+break+Past glass det *where* N+bother+Past K.
'Where did [the rumor [that Pinchu broke the glass t]] bother Kengo?'

(20) *mɯ̀làà njiɛ̰ pìí ncū nʃíɛ̀ ndūgɔ̀ lá saaləgə nkʰiɛ̰ kɛɛŋɔ
gossip that P. N+break+Past glass det *how* N+bother+Past K.
'How did [the rumor [that Pinchu broke the glass t]] bother Kengo?'

(21) *mɯ̀làà njiɛ̰ pìí ncū nʃíɛ̀ ndūgɔ̀ lá njiɛ̰ nkʰiɛ̰ kɛɛŋɔ
gossip that P. N+break+Past glass det *why* N+bother+Past K.
'Why did [the rumor [that Pinchu broke the glass t]] bother Kengo?'

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constraints under which the elicitations took place, we did not feel it necessary to painstakingly transcribe all the tones. SH stands for the super high tone associated with the past tense (Ben-Shalom, this volume).

[5] Here, as everywhere else in the paper, we dispense with giving the form without a WH constituent. However, we have checked those and in all ungrammatical WH questions discussed from here on, the corresponding declarative sentences are well-formed. We will signal the 'offending' WH element to the reader by italicizing it in the morph-by-morph gloss. An italicized WH word in an example is therefore to be understood as a WH item whose corresponding non-WH item makes the sentence grammatical.

[6] Another word exists for 'where' in Nchufie, namely *kə yuū* literally 'what place'. Although more specific, this WH word does not possess the properties of a D-linked WH phrase as discussed in Pesetsky (1987). In fact, in Nchufie, there is almost no evidence for any WH phrase, even the most specific ones, behaving in a way similar to the D-linked WH phrases of the cited article.

Examples (17) to (21), especially (17), show that unlike Chinese, the Subject Condition holds in Nchufie, contrary to the view that subjacency is not an active principle of LF movement. There is a case where extraction is possible however. This occurs when the clause containing the subject CNP is itself embedded inside a higher clause:

(22) ɔ̀ zí njiɛ̨ mɯ̀làà njiɛ̨ pìíncū ɲʃìɛ̀ kə̄́ nkʰiɛ̨ kɛɛŋɔ
you know that rumor that P. N+break what N+bother K.
'What do you know [that [the rumor [that Pinchu broke t]] bothered Kengo]?'[7]

We will return to this example when we present our analysis of Nchufie WH in situ.

4. CNPC in Nchufie: The Relative Clause Type

Relative clauses are barriers to movement in a language like English.

(23) *Who do you like the person who knows t well?

In Nchufie also, relative clauses are absolute barriers to movement. This is true whether the relative clause is in the subject or object position, and whether one tries to extract a subject, an object, or an adjunct WH from within the relative clause.

4.1. Relative Clauses in Object Position

Here are the cases of relative clauses in the object position of a clause, inside which, first the subject and then the object is relativized:

4.1.1. Subject Relativized

(24) *ɔ̀ɔ́ njəɯ mɛ̄ à yā à njī wə̄
you+SH saw child Op comp he knew *who*
'Who did you see the child who knew t?'

[7] Although our consultant consistently tells us that this sentence is good as a question, we have a hard time really understanding what its precise meaning is. She sometimes tells us that the sentence is a Yes/No question. This is probably due to the fact that, quite generally, WH in-situ questions embedded inside what should constitute islands to movement have interpretations that are quite different from those of "normal" WH questions. For example, Huang's account of (i) below predicts that the sentence should have a normal WH question interpretation.
(i) shei yao mai de shu zui gui ?
who want buy DE book most expensive
'books that who wants to buy are most expensive?'
Yet, as he himself mentions (Huang 1982, p.381), 'In [(i)] the speaker is, in effect, asking which book, in terms of the identity of the person who is buying it, is the most expensive.' We can interpret this type of readaing as indication that LF WH movement is not a process completely free of subjacency, and that WH phrases cannot move in an unbounded fashion.

(25) *ɔ̀ɔ́ njə̄ɯ mɛ̄ à yā à njī nyɛ́nɔ̀ ŋɔ̄
you+SH saw child Op comp he knew *which* *man*
'Which man did you see the child who knew t?'

(26) *piincu ntu ŋɔ a ya a nʃiɛ kə
P. kicked person Op that res.pr. broke *what*
'What did Pinchu kick the person who broke t?'

(27) *piincu ntu ŋɔ a ya a nʃiɛ ndugɔ saaləgə
P. kicked person Op that res.pr. broke glass *how*
'How did Pinchu kick [the person [who broke the glass t]]?'

(28) *piincu ntu ŋɔ a ya a nʃiɛ ndugɔ njiɛ
P. kicked person Op that res.pr. broke glass *why*
'Why did Pinchu kick [the person [who broke the glass t]]?'

(29) *piincu ntu ŋɔ a ya aa nʃiɛ ndugɔ fə
P. kicked person Op that res.pr. broke glass *where*
'Where did Pinchu kick [the person [who broke the glass t]]?'

Notice here that there is a minimal contrast between object extraction out of a relative clause in (24) through (26), and object extraction out of an object Noun-Complement CNP in the grammatical (13).

4.1.2. Object Relativized

(30) *ɔ̀ɔ́ njə̄ɯ ŋwaɛ à ya wə njaa
you+SH saw book Op comp *who* stole
'Who did you see [the book [that t stole]]?'

(31) *ɔ̀ɔ́ njə̄ɯ ŋwaɛ à ya piincu njaa njiɛ̃
you+SH saw book Op comp P. stole *why*
'Why did you see [the book [that Pinchu stole t]]?'

(32) *ɔ̀ɔ́ njə̄ɯ ŋwaɛ à ya piincu njaa saaləgə
you+SH saw book Op comp P. stole *how*
'How did you see [the book [that Pinchu stole t]]?'

(33) *ɔ̀ɔ́ njə̄ɯ ŋwaɛ à ya piincu njaa fə
you+SH saw book Op comp P. stole *where*
'Where did you see [the book [that Pinchu stole t]]?'

Notice here that there is a minimal contrast between subject extraction out of an object relative clause in (30) and subject extraction out of an object Noun-Complement CNP in the grammatical (14) .

4.2. Relative Clauses in Subject Position

Here are the cases of a relative clauses in the object position of a clause, inside which, first the subject and then the object is relativized:

4.2.1. Subject Relativized

(34) *ŋɔ a yɑ ɑ nʃiɛ kə ntɔ piincu
person Op that res.pr. broke *what* kicked P.
'What did [the person [who broke t]] kick Pinchu?'

(35) *ŋɔ a yɑ ɑ nʃiɛ ndugɔ sɑɑləgə ntɔ piincu
person Op that res.pr. broke glass *how* kicked P.
'How did [the person [who broke the glass t]] kick Pinchu?'

(36) *ŋɔ a yɑ ɑ nʃiɛ ndugɔ njiɛ̰ ntɔ piincu
person Op that res.pr. broke glass *why* kicked P.
'Why did [the person [who broke the glass t]] kick Pinchu?'

(37) *ŋɔ a yɑ ɑ nʃiɛ ndugɔ fə ntɔ piincu
person Op that res.pr. broke glass *where* kicked P.
'Where did [the person [who broke the glass t]] kick Pinchu?'

Since we have already seen that the Subject Condition holds in Nchufie for subject CNPs, it is not surprising that all of these examples are ungrammatical. There is thus no contrast here with the Noun-Complement cases that we talked about in examples (17) through (21).

4.2.2. Object Relativized

(38) *ndugɔ ɑ yɑ wə nʃiɛ (lɑ) nkɯ tablɛ
glass Op that *who* broke det on table
'Who did [the glass [that t broke] is on the table?'

(39) *ndugɔ ɑ yɑ piincu nʃiɛ sɑɑləgə nkɯ tablɛ
glass Op that P. broke *how* on table
'How did [the glass [that Pinchu broke t]] is on the table?'

(40) *ndugɔ ɑ yɑ piincu nʃiɛ njiɛ̰ nkɯ tablɛ
glass Op that P. broke *why* on table
'Why did [the glass [that Pinchu broke t]] is on the table?'

(41) *ndugɔ ɑ yɑ piincu nʃiɛ fə nkɯ tablɛ
glass Op that P. broke *where* on table
'Where did [the glass [that Pinchu broke t]] is on the table?'

Again these examples are all ungrammatical as instances of the Subject Condition violations. As expected, there is no contrast between these and the preceding examples (17) through (21).

5. WH Islands

In a language like English, one cannot extract anything from inside a clause headed by a WH phrase. (42) is an ungrammatical sentence resulting from the violation of the WH Island Constraint:

(42) *What do you wonder who saw t ?

The WH Island Constraint holds in Nchufie as well, although relevant cases have proved to be very difficult to elicit. We were able to find some examples:

(43) *ɔ̀ ɣɛ̌ kə yɑ̀ wə nʃiɛ [8]
you wonder what that *who* broke
'Who do you wonder [what t broke]?'

In reality, it is not entirely clear whether we are dealing here with a 'true' WH Island. It could be that the verb ɣɛ 'to wonder or to ponder about' in Nchufie takes a direct object which must then be followed by a relative clause.[9] In this case, the structure of (43) would look (43'):

(43') ɔ̀ ɣɛ̌ kə$_i$ [$_{CP}$ *Op$_i$* [$_{C°}$ yɑ̀ [$_{IP}$ wə nʃiɛ *t$_i$*]]

The following sentence suggets that this might be the case:

(44) ɔ̀ ɣɛ̌ ŋɔ [$_{CP}$ ɑ [$_{C°}$ yɑ̀ [$_{IP}$ àá nʃiɛ lɑ]] [10]
you wonder person Op that res.pr.+Past N+break it
'You wonder who broke it'

---

[8] This sentence is ungrammatical only in the wide scope constual of 'who'.

[9] As Hilda Koopman (p.c.) points out, this is partially similar to the French indirect question constructions: when an inanimate argument is being indirectly questioned, French resorts to the strategy of having the complementizer 'que' or 'qui' (depending on whether the question is about an object or a subject respectively) preceded by a demonstrative pronoun. Thus (i), where the object is questioned, contrasts with the ungrammatical (ii), where the structure follows the pattern of main clause question formation; and (iii), where the subject is questioned, contrasts with the ungrammatical (iv):

(i) Je me demande ce que Jean a lu t récemment
I myself ask that(dem.) that(C°) j. has read recently
'I wonder what Jean has recently read'

(ii) *Je me demande que/quoi Jean a lu t récemment
I myself ask what J. has read recently

(iii) Je me demande ce qui est arrivé à Marie
I myself ask that(dem) that(C°+SuAgr) is arrived to M.
'I wonder what happened to Marie'

(iv) *Je me demande qui/que/quoi est arrivé à Marie
I myself ask what is arrived to M.

Note though that the parallel between Nchufie and French is only partial: Nchufie, not French, uses this type of construction across-the-board, with inanimate as well as with animates, and with adjuncts as well as with arguments.

[10] For an analysis of the resumptive pronouns in Nchufie, see Sano (this volume). Nakamura (this volume) argues along the lines mentioned here that (44) is in fact not a WH Island configuration.

In (44), the indirect question clearly takes the form of a relative clause and therefore (43) may very well be another case of the Relative Clause Island effect that we looked at in Section 4.

Fortunately though, there are more convincing cases of WH Islands in Nchufie. One involves a 'whether' clause:

(45) *ɔ̀ ɣɛ̂ kɛ̄ piincu nʃiɛ kə̄́
you wonder if P. N+break *what*
'What do you wonder if Pinchu broke t ?'

In (45), material cannot escape the embedded clause headed by 'whether' even when it is an argumental WH phrase. Another case of WH Island is found after the verb *zĩ* 'know', when it is negated. The basic construction is as follows:

(46) ŋ ka zi kɛ̂ɛ piincu nʃiɛ ndugɔ pə
I neg know how P. broke glass neg
'I don't know how Pinchu broke the glass'

In (46), *kɛ̂ɛ* 'how' creates a WH Island configuration. This structure prohibits movement from inside the embedded clause, as demonstrated in (47) through (50), where an object, a subject, a locative adverbial and a reason adverbial have been extracted, respectively:

(47) *ɔ̀ ka zi kɛ̂ɛ piincu nʃiɛ kə pə
you neg know how P. broke *what* neg
'What don't you know [how Pinchu broke t]?'[11]

(48) *ɔ̀ ka zi kɛ̂ɛ wə nʃiɛ ndugɔ pə
you neg know how *who* broke glass neg
'Who don't you know [how t broke the glass]?'

(49) *ɔ̀ ka zi kɛ̂ɛ piincu nʃiɛ ndugɔ fə pə
you neg know how P. broke glass *where* neg
'Where don't you know [how Pinchu broke the glass t]?'

(50) *ɔ̀ ka zi kɛ̂ɛ piincu nʃiɛ ndugɔ njiɛ̃ pə
you neg know how P. broke glass *why* neg
'Why don't you know [how Pinchu broke the glass t]?'

The ungrammaticality of (47) and (48) contrasts with the claim that subjacency does not hold at LF for arguments, e.g., Huang (1982).

[11] The lower clause construal of the italicized WH phrases in (47) through (50) is grammatical.

6. Adjunct Islands

We have so far been unable to elicit data for adjunct clauses other than the time adjunct clauses headed by 'before'.

(51) pìí́ncū njə̄ɯ̀ wə̀ (nkɔ̀) kɛɛ́ŋɔ̄ pəgə mɔ nʃiɛ ndugɔ səɯ
P.+Past N+see me first K. before broke glass the
'Pinchu saw me before Kengo broke the glass'

The mystery with these clauses is the exact nature of the word for 'before', *pəgə mɔ*. It certainly does not look like a complementizer or a preposition, and it might be some sort of aspectual marker.[12] However, it is beyond the scope of our inquiry to give an analysis of this construction. It is sufficient for our purposes that these clauses function like time adjuncts. The extraction properties of before-clauses are the following:

(52) *pìí́ncū njə̄ɯ̀ wə̀ (nkɔ̀) kɛɛŋɔ mbəgə mɔ nʃiɛ kə̄́
P.+SH N+see me first K. before broke *what*
'What did Pinchu see me [before Kengo broke t] ?'

(53) *pìí́ncū njə̄ɯ̀ wə̀ (nkɔ̀) kɛɛŋɔ mbəgə mɔ nʃiɛ nyɛnɔ ndugɔ
P.+SH N+see me first K. before broke *which glass*
'Which glass did Pinchu see me [before Kengo broke t]?'

(54) *pìí́ncū njə̄ɯ̀ wə̀ (nkɔ̀) wə̄́ pəgə mɔ nʃiɛ ndugɔ səɯ
P.+SH N+see me first *who* before broke glass the
'Who did Pinchu see me [before tbroke the glass]?'

(55) *pìí́ncū njə̄ɯ̀ wə̀ (nkɔ) kɛɛŋgɔ pəgə mɔ nʃiɛ ndugɔ səɯ fə̄
P.+SH N+see me first K before N+break glass the *where*
'Where did Pinchu see me [before Kengo broke the glass t]?'

(56) *pìí́ncū njə̄ɯ̀ wə̀ (nkɔ) kɛɛŋgɔ pəgə mɔ nʃiɛ ndugɔ səɯ njiɛ̃
P.+SH N+see me first K before N+break glass the *why*
'Why did Pinchu see me [before Kengo broke the glass t]?'

(57) *pìí́ncū njə̄ɯ̀ wə̀ (nkɔ) kɛɛŋgɔ pəgə mɔ nʃiɛ ndugɔ səɯ ləgə
P.+SH N+see me first K before N+break glass the *how*
'How did Pinchu see me [before Kengo broke the glass t]?'

The examples above suggest that the Adjunct Condition, sometimes considered a subset of subjacency, Chomsky (1986), holds in Nchufie since one cannot extract anything out of a time adjunct clause. Notice that here again, the specificity of the WH phrase does not make a difference; (53) is ungrammatical on a par with the non-specific WH phrase in (52). Pesetsky's (1987) notion of D-linking does not seem to have any comparable effects in Nchufie.

[12] Nam (this volume) investigates some aspectual markers of Nchufie in his study on negation.

This data on the Adjunct Condition concludes the descriptive part of the paper. Our survey of the locality of Nchufie WH in situ has yielded the following observations:

1° LF movement of WH phrases out of a Noun-Complement CNP is possible iff:

i. the CNPs in object position and
ii. the WH phrase in situ is an argument

2° LF movement of WH phrases is impossible out of:

i. Relative clauses,
ii. WH Island configurations
iii. Adjunct Islands.

In other words, the only case of long distance WH movement at LF is the one where an argument is extracted out of a properly governed domain. This suggests that subjacency holds at LF in Nchufie. In the following section, we will give our analysis of the facts discussed so far.

7. Analysis

7.1. Subject Condition

As we have seen throughout, no LF movement can initiate from inside a subject in Nchufie, contrary to other well-known WH in situ languages like Chinese or Japanese. Taking Chinese as a representative of such languages, Huang (1982) and Lasnik and Saito (1984) argued that the subject position is properly governed by INFL in Chinese, in order to explain why movement from the subject position is at all possible in this language. We want to argue here that the subject position is not properly governed in main clauses in Nchufie. The evidence for this is twofold. First, recall that WH in situ is not acceptable for subjects, see in (6b):

(6b) *wə kwɛ piincu
who likes P.
'Who likes Pinchu?'

This is unlike the WH in situ with objects and adjuncts, cf. (1) through (5) in section 1. The fact that subjects cannot be questioned in situ suggests that they are not properly governed by INFL or COMP, and that their traces violate the ECP by failing to be properly head-governed at LF.

The second piece of evidence that suggests Nchufie subjects are not properly governed comes from the behavior and distribution of resumptive pronouns in this language. Sano (this volume) argues that the resumptive pronouns of Nchufie are the spelled-out traces of movement and are used as a strategy to overcome ECP violations.

This also suggests that the resumptive pronoun in example (6a) helps avoid an ECP violation that would have resulted from the lack of proper government of the subject trace by the Operator in the Spec CP of the embedded clause.

(6a) ɑ wə yɑ ɑ kwɛ piincu
expl who compl res.pr. like P.
'Who likes Pinchu?'

We refer the reader to Sano (this volume) and to Nakamura (this volume) for the details of this construction and the analysis of resumptive pronouns of Nchufie.

Having established that subjects are not properly governed in Nchufie, we now make the prediction that subjects of embedded clauses should be able to be questioned in situ if the Complementizer is a proper head governor in this language. This follows from Kayne's (1984) claim that if a head governs an XP, it also governs the Specifier of that XP. Now let us look at (14), which contrasts minimally with (6b):

(14) ɔ̀ɔ́ njōò̰ mɯ̀làà njiɛ̰̂ wə̄́ njàā ŋwɑɛ
you+SH heard rumor that who stole book
'Who did you hear [the rumor [that t stole a book]]?'

(6b) *wə kwɛ piincu
who likes P.
'Who likes Pinchu?'

If we assume that *njiɛ̰* 'that' is a proper head governor,[13] then the contrast between (14) and (6b) follows straightforwardly: it is only in (14) that there is a proper governor to license the WH trace at LF.

The ability of *njiɛ̰* to properly govern its complement allows a subject CNP of the Noun-complement type to behave like an object CNP. This explains the lack of contrast between (22) and (13):

(22) ɔ̀ zí njiɛ̰ mɯ̀làà njiɛ̰ pìíncū nʃíɛ̀ kə̄́ nkʰiɛ̰ kɛɛŋɔ
you know that rumor that P. N+break what N+bother K.
'What do you know [that [the rumor [that Pinchu broke t]] bothered Kengo]?'

(13) ɔ̀ɔ́ njōò̰ mɯ̀làà njiɛ̰̂ pìíncū njàā kə̄
you+SH heard rumor that P. stole what
'What did you hear [the rumor [that Pinchu stole t]]?'

In (22), the subject CNP is properly governed by *njiɛ̰* and is therefore like an object for the purpose of WH movement from inside it.

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[13] This assumption is supported by the fact that this complementizer is homophonous with the verb that means 'to say' in Nchufie. We simply assume here that, these two are historically the same, and that *njiɛ̰* has retained its property of proper governor when it became specialized as a C°.

7.2. LF movement and S-structure Movement

So far, our survey of Nchufie WH in situ leads us to conclude simply that subjacency holds at LF in the language with the exception of those cases that involve L-marked Noun-Complement CNPs, which are transparent domains for movement. This would be all we would need to say if there were no asymmetry between S-structure and LF movement in Nchufie. The following example suggests however, that this is not the case

(58) *ŋwaɛ a ya màá njōò mɯ̀laà njiɛ̰ piincu njàā
book *Op* Compl I+SH heard rumor that P. stole
'The book [which I heard [the rumor [that Pinchu stole t]]]'

(58) contrasts with (13) above in that, WH movement at LF is possible out of an L-marked CNP in the former, while in the latter, S-structure empty Operator movement is disallowed, although the extraction domain is exactly the same in both cases. This forces the conclusion that the properties of movement at LF and S-structure are not parallel in Nchufie. In particular, material can escape an L-marked context only at LF, but not at S-structure.

7.3. LF Pied-Piping

One avenue to explore in accounting for this aymmetry is to have the whole CNP move at LF when it is properly governed. These would be cases where the CNP is in the object position and/or wherever it is properly governed, e.g., in the subject position of a clause introduced by *njiɛ̰*. That is, we wish to utilize the possibility that LF movement can proceed through Pied-Piping of the whole structural domain that defines an island in the syntax. This is not a new idea; it was first proposed in the work of Choe (1984) and Nishigauchi (1984, 1986) and made popular by Pesetsky (1987). The explanation of the grammatical cases of island violations will be unitary: in each case, the island will move as a whole. In Nchufie, this movement seems to be further constrained by the condition that the island itself be L-marked, which entails that it is a properly governed constituent. This explains why an island in subject position of a main clause can never be extracted out of. As we have seen in section 7.1, the subject is not properly governed, so its LF pied-piped movement must leave behind a trace that is not properly governed, leading to an ECP violation.

However, merely to say that LF movement can pied-pipe the whole island will not suffice. For one thing, it fails to explain the ungrammaticality of the extraction of a WH

phrase embedded inside a relative clause in object position, (24), and of the extraction of a WH phrase from inside a WH Island, (47).

(24) *ɔ̀ɔ́ njə̄ɯ mɛ̄ à yā à njɪ̄ wə̄
you+SH saw child Op comp he knew *who*
'Who did you see [the child [who knew t]]?'

(47) *ɔ̀ ka zi kɛ̂ɛ piincu nʃiɛ kə pə
you neg know how P. broke *what* neg
'What don't you know [how Pinchu broke t]'

In both cases, the island is a complement of the main verb. As such, it is L-marked by it. According to the logic of the analysis so far, they should then be able to pied-pipe at LF. Yet, the sentences are ungrammatical. Why should this be the case? To resolve this problem, we propose to restrict the theory of pied-piping along the lines proposed in Moritz and Valois (to appear). These authors discuss the distribution of the negative quantifier *personne* 'nobody' in French and conclude that it moves to the Specifier of Neg(ation)P at LF the latest. They adopt a version of LF Pied-Piping which has the characteristic of being sensitive to filled Specifiers. A category whose Specifier is filled cannot be marked through Spec-Head agreement, with the negative feature that would have licensed it in the Spec of NegP in the first place. As a consequence, a category whose Spec is filled cannot be pied-piped at LF. Going back to (24) and (47), we notice that the highest Specifier of the island is filled in both cases by the relative operator in (24), and by the WH phrase in (47). According to Moritz and Valois's theory extended to WH movement, those CPs should not be able to pied-pipe at LF and a subjacency violation should result when one attempts to extract a WH phrase from within them. As it stands, this theory makes the right prediction with respect to the cases of WH Islands and relative clauses in Nchufie.

Moritz and Valois also make the right predictions for the grammatical cases of pied-piping, i.e., for the extraction from inside an L-marked Noun-Complement CNP. We repeat here (13), (14), and (22):

(13) ɔ̀ɔ́ njōò̰ mɯ̀làà njiɛ̰̂ pìí ncū njàā kə̄
you+SH heard rumor that P. stole what
'What did you hear [the rumor [that Pinchu stole t]]?'

(14) ɔ̀ɔ́ njōò̰ mɯ̀làà njiɛ̰̂ wə̄́ njàā ŋwaɛ
you+SH heard rumor that who stole book
'Who did you hear [the rumor [that t stole a book]]?'

(22) ɔ̀ zí njiɛ̰ mɯ̀làà njiɛ̰ pìí ncū nʃiɛ̀ kə̄́ nkʰiɛ̰ kɛɛŋɔ
you know that rumor that P. N+break what N+bother K.
'What do you know [that [the rumor [that Pinchu broke t]] bothered Kengo]?'

In such cases, there is no filled Specifier blocking the pied-piping of the island, and the derivation proceeds in a grammatical fashion.

7.4. Arguments and Adjuncts in Object Position CNPs

Another contrast that begs for an explanation is the contrast between the grammatical (13) and (14) above on the one hand, and the ill-formed (15) and (16) on the other :

(15) *ɔ̀ɔ́ njōò mʉ̀làà njiɛ̰̄ pìíncū njàā ŋwaɛ saaləgə
you+SH heard rumor that P. stole book *how*
'How did you hear [the rumor [that Pinchu stole a book t]]?'

(16) *ɔ̀ɔ́ njōò mʉ̀làà njiɛ̰̄ pìíncū njàā ŋwaɛ njiɛ̰̄
you+SH heard rumor that P. stole book *why*
'Why did you hear [the rumor [that Pinchu stole a book t]]?'

We know from sentences (2) through (5) in section 1 that main clause adjuncts can move at LF to the SpecCP of their clauses and satisfy the WH-criterion of Rizzi (1990) there. Therefore nothing should prevent them from moving to the Specifier of the embedded CP in (15) and (16). What must be blocked however, is the pied-piping of the whole embedded clause when it inherits the WH feature from an adjunct. The following observation may provide the clues as to how this can be achieved. We have already noted that the only cases of legitimate LF extraction of WH phrases are the ones that come from L-marked domains, i.e., the complements of verbs or of complementizers with verbal properties like *njiɛ̰̄*. Assuming as we have, that all these cases involve pied-piping at LF, this would mean that all instances of pied-piping we have observed in Nchufie are those of argumental (L-marked) XPs. Suppose now that in (15) and (16), once the adjunct moves to the Spec of the embedded CP, it transmits not only the WH feature needed for pied-piping, but also its non-argumental properties. This would make the CP simultanously an argument and a non-argument: it will be a non-argument by virtue of its position inside the larger clause, and an argument by inheritence from the head C. When C agrees with the argumental properties of the WH-phrase that has moved to its Specifier position and transmits its features. This clash leads to the ungrammaticality observed in (15) and (16). Note that this solution does not make reference to the proper government of adjuncts.

7.5. Lack of Pied-Piping of Adjunct Clauses

The last thing that remains unexplained in the body of data we have elicited in Nchufie has to do with the general impossibility of extracting a WH phrase from inside an adjunct clause. (52) illustrates this point:

(52) *pìí́ncū njə̄ʉ̀ wə̀ (nkɔ̀) kɛɛŋɔ mbəgə mɔ nʃiɛ kə̄́
P.+SH N+see me first K. before broke *what*
'What did Pinchu see me [before Kengo broke t] ?'

The problem here is the following. We know that adjuncts, and in particular the WH time adjuncts such as *ndə kə* 'what time' can be questioned in situ in Nchufie. This means that the entire adjunct clause should be able to move up at LF when a WH-phrase moves to the Specifier of its CP. We also know that object Wh-phrases can move to the Specifier of their CPs at LF. It can be seen in (52) however, that a WH-phrase embedded in side an adjunct clause cannot take main clause scope, indicating that the pied-piping option is not available in these instances. A way to block pied-piping from applying here is to assume that the adjunct clause does not receive the WH features of the WH phrase at LF, even though th WH-phrase moves to the Specifier of its CP. Suppose now that the transmittal of these features cannot proceed because the Specifier of the time adverbial CP is already occupied by another empty operator. This has already been suggested by Larson (1983), who argues that a temporal operator should be present in the structure of time adjuncts. The time operator is adverbial in nature and therefore cannot absorb the lower WH phrase.[14] This means that the Specifier position of a time adjunct clause is not available for movement of anything within its domain. This gives us the right result in (52).

8. Conclusion and Further Issues

In this paper we have studied the syntax of WH in situ in Nchufie. However incomplete our study has been, the observations we have made thus far have lead us to conclude that subjacency as a principle of grammar is operational at LF as well as at S-structure. In other words, it is a principle that constrains all forms of movement. We believe that our inquiry is grounded on sufficiently solid generalizations that would make future work fruitful.

At this point, there are two main issues that need further investigation:

1° Akira Nakamura (p.c.) points out a sentence in which S-structure movement seems to have occurred across a relative clause:

[14] This account does not explain the difference between Nchufie and English with respect to the absorption ability of an adverbial operator. As is well-known, a sentence like (i) below is ambiguous between a reading in which the lower WH argument is interpreted as absorbed by the operator in the main clause CP, and another reading in which it is interpreted as absorbed by the operator in the embedded CP:
(i) Who wonders where John bought what?
The latter reading is the problematic one. This might lead us to conclude that generally, operators in Nchufie fail to be able to absorb anything, for reasons that are not yet understood. Of course, it might be that we simply failed in eliciting the relevant readings from our consultant.

(59) àá̋ mbuɔ̄ wə̄́ yə̀ ɔ̀ɔ́ njəɯ̀ mútāŋ yə̀ màá ŋfə la
expl. for who that you saw sheep that I gave det.
'To whom is it that you saw the sheep that I gave?'

If this example turns out to be a grammatical sentence of Nchufie, we lose the asymmetry between S-structure and LF movement in Nchufie and with it, much of the motivation behind the pied-piping story. This does not mean that we should abandon the whole idea though, because it would still remain as an open question why the other cases of LF movement of WH phrases observe subjacency-type locality. Also the ungrammaticality of (58) would become a complete mystery.

(58) *ŋwaɛ a ya màá̋ njōò̰ mɯ̀laà njiɛ̰ piincu njàā
book *Op* Compl I+SH heard rumor that P. stole
'The book which I heard the rumor that Pinchu stole t '

2° There were some elicitations that seem to contradict the pied-piping explanation of the locality restriction of LF movement. These sentences involve a CNP of the Noun Complement type, but introduced by a relative clause operator directly followed by a sentence beginning by 'they say':

(60) ɔ̀ɔ́ njɔɔ̰ mɯ̀làà má poó̋ njiɛ̰ wə nʃiɛ ndugɔ
you+Past N+hear rumor which they said who N+break glass
'Who did you hear [the rumor [they said [that t broke the glass]]]?'

The problem here is that it is not clear how the deeply embedded WH phrase can escape what seems to be a higher relative clause. A more careful study of this particular structure is needed in order to understand the significance of (60).

REFERENCES

Aoun, J., N. Hornstein, and D. Sportiche. 1981. Some Aspects of Wide Scope Quantification. *Journal of Linguistic Research* 1, 3: 69-95.

Ben-Shalom, D. This volume. The Tones of Nchufie Verbal Inflection.

Chomsky, N. 1973. Conditions on Transformations. In *A Festrscrift for Morris Halle*. S. Anderson and P. Kiparsky eds. Holt, Rinehart and Wilson. New York.

_____. 1986. *Barriers*. LI Monographs. MIT Press. Cambridge, Massachusetts.

Choe, J.W. 1984. *Wh-Movement: A Case of Pied-Piping?* Ms. University of Massachusetts, Amherst.

Huang, C.-T. J. 1982. Move Wh in a Language without Wh Movement. *The Linguistic Review* 1; 369-416.

Kayne, R. 1984. *Connectedness and Binary Branching*. Foris Publications. Dordrecht, Netherlands.

Larson, R. 1983. *Extraction and Double Selection in PP*. Ms. MIT.

Lasnik, H. and M. Saito. 1984. On the Notion of Proper Government. *Linguistic Inquiry*, 15: 235-289.

Moritz, L. and D. Valois. To appear. *Pied Piping and Specifier-Head Agreement.*

Nakamura Akira. This volume. On Wh-Questions in Nchufie.

Nam, Seungho. This volume. Negation in Nchufie.

Nishigauchi, T. 1984. *Japanese LF: Subjacency vs. ECP*. Ms. Shoin College. Kobe.

_____. 1986. *Quantification in Syntax.* Doctioral Dissertation. University of Massachusetts, Amherst.

Pesetsky, D. 1987. Wh-in-situ: Movement and Unselective Binding. In *The Representation of (In)definiteness.* E. Reuland and A. ter Meulen eds. MIT Press.

Rizzi, L. 1990. *Relativized Minimality.* LI Monographs. MIT Press.

Sano, T. This volume. Resumptive Pronouns in Nchufie, the ECP, and the Least-Effort Condition.