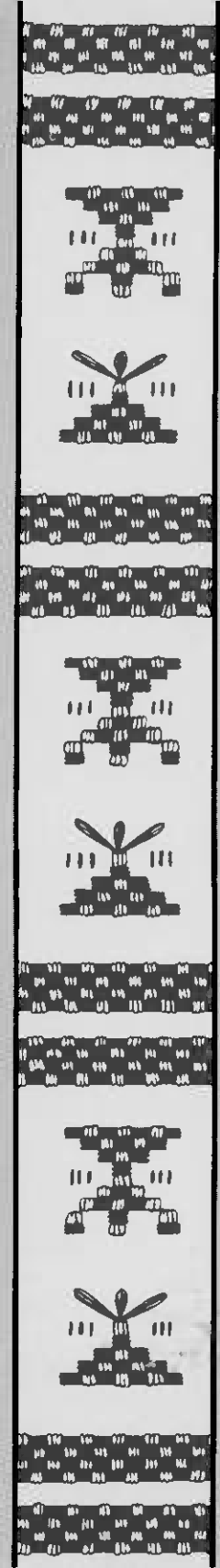

Senoufo Phonology, Discourse to Syllable

(A Prosodic Approach)

Elizabeth Mills

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SENOUFO PHONOLOGY, DISCOURSE TO SYLLABLE
(a prosodic approach)

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SENOUFO PHONOLOGY, DISCOURSE TO SYLLABLE
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by

Elizabeth Mills

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FOREWORD

Underlying this work is the hypothesis that any linguistic utterance, of whatever size, includes as one of its essential components a coherent and hierarchically organized phonological structure. This view as such is not new. It has been most explicitly stated within the framework of the tagmemic approach to language analysis, where the phonological hierarchy has equal theoretical status with the interrelated semantic (or referential) and grammatical hierarchies.

In spite of all this, and while among tagmemicists many have made reference to various units of the phonological hierarchy, few have attempted to demonstrate its validity for the higher levels beyond the stress group, and still less for the whole of discourse in any given language. Recognition of an independent phonological structure extending beyond the syllable is not limited to tagmemics. It is inherent in the prosodic approach pursued by Firthian linguists and is also implied in much of the French linguistic work on non-European languages. The complementary nature of the paradigmatic and syntagmatic dimensions of phonology has even been the point of departure for the description of another Gur language, Kasim (Bonvini 1974).

This study of Senoufo is probably unique in that it offers a consistent and thorough application of the concept of phonological hierarchy to the full range of relevant units of a given language, from the simplest to the most complex. It shows not only that the phonological component is an object worth studying for its own sake with reference to syllables, words, stress groups, and sentences, but also that coherent phonological structure extends beyond these units to paragraphs and to full discourse.

The justification for giving independent consideration to phonological phenomena at higher levels lies not so much in the autonomy of the phonological organization with regard to grammatical structure, as in revealing the linguistic pertinence and nonrandomness of a whole range of phenomena which tend to be neglected or relegated outside of linguistics. Apart from occasional skewing, there is essential correlation between syntactico-semantic units and categories on the one hand and phonological features on the other. Some of the latter are: the distinc-

tion between level and terrace intonation, and parameters like width of interval, volume, speed, and their interplay. While on the one hand these features reflect the grammatical structure of the discourse, it is convincingly demonstrated that at the same time they organize themselves into their own (suprasegmental) hierarchy sui generis.

One might argue that the limited number of sample texts in this study makes some of the generalizations about Senoufo discourse phonology questionable. This objection--which holds against most discourse studies --cannot be entirely disregarded. However, even the skeptic will admit that the study provides a set of useful hypotheses on which to build further research based on more comprehensive sampling.

It is worth pointing out that the approach taken by the author to discourse phonology also makes a contribution to the domain of speech styles in oral literature. Her method of charting intonational and similar characteristics at higher levels would seem to lend itself to wider application.

The treatment of the lower levels in terms of a hierarchical approach, although more common, should be of considerable interest. In many respects Senoufo seems to lend itself particularly well to a prosodic analysis which relates distinctive or demarcative features to units of various sizes. It turns out that the syllable, although being a recognizable entity, is less crucial in phonological structure than the word, which is the unit to which such distinctive features as tone, length, nasalization, and secondary release relate. The word also constitutes the domain where demarcative features like stress, rhythm, and vowel sequences operate. Most of the subphonemic variation of consonants and vowels can be consistently accounted for in terms of these word features, especially rhythm, whereas morphophonemic variations tend to occur as juncture phenomena within the larger units of the compound word and the phonological group.

At the level of elementary units, one notes among other interesting facts the complementary distribution of labialized and palatalized release and the quite unusual contrasts between **kp** and **kp^{m}** and between **gb** and **gb^{m}**.

Beyond its methodological interest, the value of Mrs. Mills's study is enhanced by the fact that it is the first comprehensive description of the phonology of a language belonging to the Senoufo cluster.

Finally, it must be said that a mere academic interest in the language would not have made possible an account of Senoufo speech as close to the reality of everyday use as we have it here. Rather, the analytical expertise had to be supplemented by many years of experience in listening to and using the language. It is this first-hand knowledge of the spoken language which made this volume possible.

Thomas Bearth
Linguistic consultant of the
Société Internationale de Linguistique
(Summer Institute of Linguistics in
Ivory Coast, Upper Volta, and Mali)

PREFACE

The Senoufo people are a large ethnic group, numbering more than a million, of whom about 0.7 million live in Ivory Coast and probably over half a million in Mali.[1] In addition, forty thousand live around Banfora, Upper Volta (Hook, Mills, and Mills 1975), several thousand more in the southwest corner of Upper Volta (Prost 1964),[2] and a group of thirty thousand along both sides of the Ghana-Ivory Coast border in the vicinity of Bondoukou, Ivory Coast.[3]

Senoufo was classified as a member of the Gur or Voltaic subgroup of the Niger-Congo family by Westerman and Bryan (1952), by Greenberg (1963), and by Manessy (1963). J.T. Bendor-Samuel (1971) confirmed and further defined this classification, relying for his work on discussions in Westerman and Bryan, Manessy, on personal communications with other linguists, and on field data of colleagues.

The Senoufo area covers the central half of the northern section of Ivory Coast, north across the Mali border almost to the Niger River near San, and across the Upper Volta border in the southwest corner. Separate groups live in the Banfora area of Upper Volta and in Ghana. The accompanying map shows the Senoufo area in Ivory Coast, Mali, Upper Volta, and Ghana, and includes the main towns and separate Senoufo language groups. Also included in the map are the percentages of mutual intelligibility of these groups with the central Senari (Tyebaara dialect) of Korhogo which this phonology describes.

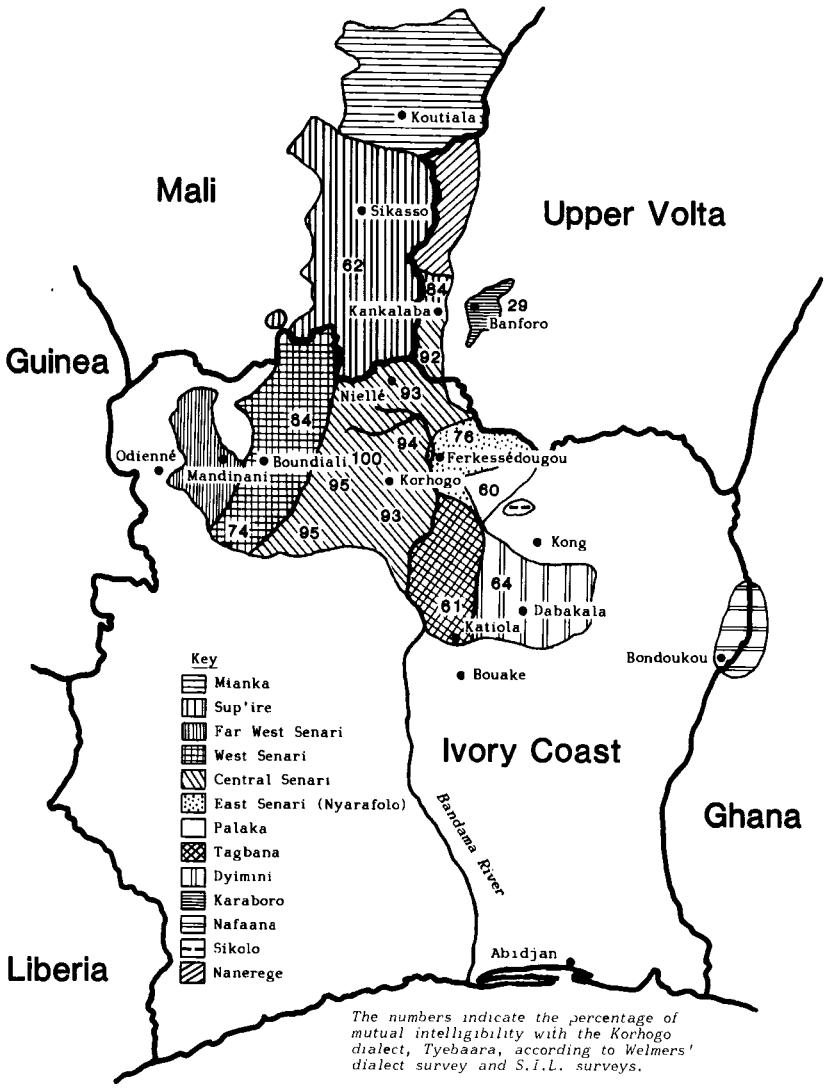
Traditionally the Senoufo people are farmers who live in villages and farm the areas around them. They are also known for their art. In Ivory

1 These figures are based on the number 662,978 for Senoufo area populations given by Derive and Lafage (1977:7) and on statistics from the 1975 census for Séguela and Odienné and an estimated number of Senoufos living in Abidjan and other southern areas. The Mali figure is based on an estimated percentage of population growth from an earlier figure.

2 From our own investigation in the area in 1975 we are inclined to believe the number is greater than the five thousand given as a minimum by Prost, since the Senoufos live in a larger area than he evidently believed (see map on p. xiv).

3 Jordan, D., oral communication based on the Ghana census.

The Senoufo Peoples and their Languages



The numbers indicate the percentage of mutual intelligibility with the Korhogo dialect, Tyebaara, according to Welmers' dialect survey and S.I.L. surveys.

Coast, the recent development of the north, which includes a multiplication of schools, television, roads, agricultural projects, and some industry has introduced new economic opportunities to the predominantly rural people. Many of the youth have left the villages for the cities and larger agricultural and industrial enterprises in the south.

The exact origin of the name **Senoufo** is unknown. In this study the French spelling Senoufo is used rather than the spelling according to the English orthography, "Senufo." The French spelling is used in the Ivory Coast, Mali, and Upper Volta as well as in many linguistic journals. The name Senoufo is used by linguists and historians for the ethnic group who speak related languages and dialects and who live in the areas marked in the accompanying map. But it is important to note that no group of people calls itself Senoufo. The people call themselves or their language by the names given in the map, with some exceptions (i.e., Karaboro is the name given the group in Upper Volta, but they use the names of their local dialects). The people of the greater Senari area call themselves **Senãɔ̃** (singular) and **Senãbɛ̀lɛ̀** (plural). Possibly the stems **senou** of Senoufo and **sena** of Senãɔ̃ have the same origin. The suffix **fo** of Senoufo may come from the Dyula word 'speak'. The idea of **sena** may be 'field man' or 'belonging to the field', thus coming from a combination of the stems of **sɛʔɛ** 'field' and **nãɔ̃** 'man' or **na** 'pertaining to, belonging to'. This concept fits the fact that the people who call themselves **Senãɔ̃** are traditionally farmers, and that Senoufo people of the same area who are not traditionally farmers but are artisans call themselves by the names of their artisan groups, i.e., **kpɛ̃ɛ̃ɔ̃** 'brass worker, pottery maker', **fɔ̃nɔ̃** 'iron worker'. Senoufos of languages which are not mutually intelligible with Senari do not call themselves by the name Senaɔ, i.e., Tagbana, Dyimini, Palaka, and Fodɔnɔ. The latter is a name for a Senoufo group living among the Senabele who are traditionally farmers, but whose language is not mutually intelligible with Senari.

The stem **senã** takes derivational suffixes which give different meanings: **senãɔ̃** 'a Senoufo person', **senãbɛ̀lɛ̀** 'the Senoufo people', **senãrĩ** 'the Senoufo language', **senãgĩ** 'the Senoufo kingdom', **senãmĩ** 'the Senoufo tradition, customs'.

The various dialect groups of Senari have their own names which they call themselves and their dialect, along with the generic name Senari and Senaɔ. The name of the dialect of the Korhogo area is Tyebaara, and the person, Tyebaaɔ. The origin and meaning are not known. Tiembara and Kiembara are used in some French texts for Tyebaara.

The accompanying map shows the main language divisions of the Senoufo people: Mianka (Mambar) and Sup'ire in Mali, Karaboro in the Upper Volta, Senari in the greater Korhogo area of Ivory Coast, Tagbana and Dyimini in the southeast, and Nafana in Western Ghana. Palakas are a small group east of Ferkessédougou whose language is different enough to be considered a distinct language of the Senoufo group. Within each division exist dialects which are mutually intelligible within their own language groups. The percentages given in the map for the Mali and the Ivory Coast Senoufo dialects are those in the dialect survey of Welmers (1957), in which the author assisted. For the Upper Volta dialects, the percentages are from the Summer Institute of Linguistics dialect survey

(Hook, Mills, and Mills, 1975), in which the author assisted also. The survey method used by SIL for the Karaboro of Upper Volta differed from that used by Welmers in that for the former, taped stories and questions were used as well as a list of a hundred words. A list of several hundred words, such as Welmers used, might have yielded a higher percentage of mutual intelligibility with the Korhogo Senari. The percentages show the mutual intelligibility factors between other dialects and the Tyebaara dialect of the Korhogo area.

Senari is divided into the large central area in which the dialects average about 93 percent mutual intelligibility, and the West and East Senari fringe dialects which average about 78 percent mutual intelligibility with the Korhogo Senari. The western Senari dialects are close enough to each other to be considered together, but they show a transition away from central Senari as they extend north from Boundiali toward Sup'ire. More work needs to be done in Mali south of Sikasso to know whether the transition continues, or if there is a clear boundary between Sup'ire and Senari.

According to the above two surveys,[4] a later survey of the Palaka-Nyarafolo-Tagbana-Dyimini,[5] and our added studies, we would postulate a very early division of dialects into strips which run south to north:

1. the western Senari strip up toward Sikasso,
2. the central Senari strip, which includes the entire Korhogo prefecture and up into the southwest corner of Upper Volta past Kankalaba,
3. the strip east of the Bandama, probably not including Palaka, which seems to be a separate division. The Nafana group in Tambe and Bondoukou, Ivory Coast, and across the border in Ghana may also have been part of the eastern strip.

Even though the Nyarafolo of Ferkessédougou is now included with Senari, its system of intonation downstep resembles the intonation of the Dyimini and Tabgana language groups. Also, according to oral communication with Dean Jordan, this downstep occurs in the Nafana of Ghana.

We postulate later movements from east to west. There are a few phonetic similarities between Nafããra, which is spoken by the Nafããbele who live in the area between Korhogo and Ferkessédougou, Nyarafolo of Ferkessédougou, and the northern areas of Tagbana and Dyimini to the south and southeast. For example, in certain Tyebaara words and in other dialects west of Tyebaara, **ɔ̃:** following **p** corresponds to **ũ:** in Nafããra, Nyarafolo, and Tagbana: **pɔ̃̀:** 'dog' (Tyebaara of Korhogo) corresponds to **pɔ̃̀:** (Teneri of Boundiali), **pũ̀:** (Nafããra), **pũ:** (Nyarafolo of Ferkessédougou), **pũ:** (northern Tagbana), and **pũ:** (northern Dyimini). Also the northern dialect of Dyimini (Folo) and the northern Tagbana dialects from Niakaramadougou and Tafire manifest longer forms like the Tyebaara and fewer consonant changes in words from Tyebaara than do the southern Tagbana and Dyimini.

4 Unpublished survey made about 1966 under the auspices of the Baptist Mission of Korhogo by a committee chaired by E. Mills. In this survey we found that the results confirmed Welmers' survey, except that Tafire was found to be northern Tagbana instead of being classified with Senari.

5 The author has conducted survey courses in Tagbana and Nyarafolo for missionaries and made other studies in dialect comparison.

There is a gradation toward the Tyebaara from the northern Dyimini (Folo) across the northern Tagbana to the Nyarafolo and across the Nafããra. In Upper Volta we were told at Kankalaba that their dialect, Senar, is graded toward the Sup'ire of Sikasso (Mali) one way and toward the Tyebaara of Niellé the other way. A later dialect survey by SIL confirmed this and found another dialect group further north which is closer to the Mianka of Koutiala, Mali.

All the Senoufo language groups manifest a high degree of similarity of syntactic structure and a high percentage of cognates. The cognates are about 5 to 10 percent higher than the mutual intelligibility percentages shown on the map. Most phonemes are the same, although some fringe dialects have the voiceless velar fricative x rather than the glottal stop of Senari. These include the Tengrela dialect north of Boundiali, the Syɛ̃ɛ̃r or Tãnyɛ̃ɛ̃r dialect of Tengrela near Banfora, Upper Volta, the Central Dyimini of Dabakala, and the Palaka. The southeastern dialects have h as a regular phoneme, whereas in Senari h is extrasystemic.

Although early historians wrote that the Tyebaa people came to the Korhogo region from the vicinity of Kong, a recent study by Tiona Ouattara (1977) refutes these theories. Ouattara asserts from his study of the analyses of original versions of documents and from an intensive study of Senoufo culture and traditions that the Tyebaa people (called Tyebãabɛ̃lɛ̀) came from the region not far to the north of Niellé, Ivory Coast, between the boundaries of the Bandama and Léraba rivers. This places them in Mali north of Niellé. If they extended as far east as the Léraba River, they would also have been in southwestern Upper Volta. Ouattara claims they migrated from north to south and not from east to west toward Korhogo. After the invasions of the Mandé-Dioula peoples and their establishment of kingdoms in the Sikasso, Kong, and Odiennɛ̃ centers, the Senoufos in the extreme northwestern and northeastern regions of Ivory Coast assimilated to the invaders' culture. Anita Glaze (1975) found the same assimilation in the southwestern Senoufo area: "Fodonon elders claim that all the villages toward Mankono (i.e., the southwest) were originally Fodonon, who have since lost their identity by turning Muslim." The Fodono dialect is not mutually intelligible with the Tyebaara, Kufuru, and Nafããra dialects of the people among whom they live. The Tyebaabele people came to the Korhogo area from north of Niellé. They wanted the riches of the **nérɛ́** and **karité** fruit trees and the better farm lands around Korhogo. Although the Senoufos on the borders assimilated to the Mandé peoples, the majority kept their own languages and cultures. However, the political structure of Senoufo chiefdoms was borrowed from the Mandé peoples (Ouattara 1977).

The influence of the Mandé languages of Bambara, Malinké, and Dyula is relatively weak in the Senari of the Korhogo area. However, in the western Senari area around Mandinani toward Odiennɛ̃, the Senoufos are losing their language. Southwest of Boundiali also, some of the concord suffixes and pronouns have been lost. In the Kong areas and in other areas already mentioned above, Senoufo is no longer spoken; all speak Dyula, Malinké, or Bambara. In the southern Senoufo area around Katiola, there are a few borrowings from Baoulé. French borrowed words are less numerous than Dyula, but they are increasing as French becomes more widely known in northern Ivory Coast.

The material in this study is from the Central Senari dialect, **Tyebaara,** as spoken in Dokaha and Tiorognadougou just south of Korhogo. (Tyebaara is not to be confused with Tyebari or Tyebala, which is spoken in the west, north of Boundiali, and which is the dialect described in Laughren (1973). It is spoken by approximately 103,000 people, but other closely related dialects in the department of Korhogo bring the total to 276,800 speakers.[6]

The material was collected by the author over a period of twenty-six years and is based on research for earlier books written for the Baptist mission in Korhogo: a pedagogical grammar (including a sketch of the phonology) mimeographed in 1956; a lesson book written by the author and later revised by Ruth Casey; a glossary, and later a dictionary which was jointly researched by members of the Baptist mission and compiled by Melba Means. The earliest written material used as the basis of this phonology was the article by Welmers on Senari (Welmers 1950) and his unpublished word lists which he made available to the Baptist mission. Other research supplying a still broader base for this study was that done by the author for each of the four Tyebaara language schools, for the three survey courses she taught, and for the dialect surveys mentioned above.

Early studies in Senoufo were done with the help of Sagbana Soro, Namongo Silue, Nangaluru Silue, and Sanga Silue. Later language assistants were Nikumbegi Soro, Zie Soro, and Dossongmon Ouattara.

6 In June 1982 the official spelling of Tyebaara was changed to Cebaara to conform to the national orthography. See "Une orthographe pratique des langues ivoiriennes," Université d'Abidjan, 1979.

Acknowledgements

A number of people have directly or indirectly influenced the content and the writing of this monograph on Senoufo phonology. I can only mention here a few to whom I express my gratitude.

Dr. Thomas Bearth, linguistic consultant of the Société Internationale de Linguistique (Summer Institute of Linguistics), in the Ivory Coast and Upper Volta instructed me during workshops and in private consultations on the manuscript. Without his suggestions and help, this book could not have been written.

Professor William Welmers (1950) did the first analysis of the phonemes and tones of Senoufo and published it in "Notes on Two Senufo Languages." These and more extensive notes which he left with the Baptist Mission in Ivory Coast formed the basis of my later work. He later helped me on some problems of analysis of grammar. I am also indebted to Dr. Eugene Nida of the American Bible Society who confirmed my reanalysis of the prosody of length when I consulted with him at a translation workshop in the Upper Volta in 1967. Among courses and writings significant for this work are the Tagmemics course taught by W.A. Cook at Georgetown University and the article "Practical Phonetics of Rhythm Waves" by Kenneth L. Pike.

The measurement of length of segments in examples 82 and 95 was obtained from sonograms made by Martin Joos; similar measurements in other examples (85, 87, 96, 129, 131) were from oscillograms made by Norris McKinney.

My husband, Richard Mills, more than anyone else encouraged me to persevere in the analysis of the language and to write this book.

Others who influenced my decision to publish are: Professor Yves Person (formerly with the Ivory Coast government and later with the Sorbonne) who saw my pedagogical grammar in English and Senoufo and requested me to write the phonology and grammar for publication in French in Ivory Coast; and Mr. K. Atin, who as former director of the Institute of Applied Linguistics of the University of Abidjan, Ivory Coast, requested me to complete this work and publish it as a researcher affiliated with the University of Abidjan. I want to express my grati-

tude to the Conservative Baptist Mission Society who set me free from other work to write this book.

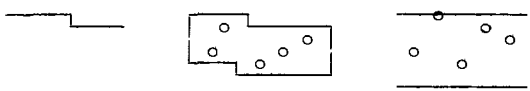
I wish to express special gratitude for the excellent assistance given me in linguistic studies by numerous speakers of Senoufo. Among the principal workers were: Mr. Sagbana Soro, Mr. Namongo Silue, Mr. Sanga Silue, Mr. Nikumbegi Soro, Mr. Nangaluru Silue, Mr. Zie Soro, and Mr. Dossongmon Ouattara.

Special thanks for a difficult job is extended to Miss Beverly Haglund who deciphered my corrected manuscript and did the prepublication typing.

Special acknowledgement is due Iris Wares who did the bulk of the editing and helped me prepare the manuscript for publication.

Symbols and Abbreviations

SYMBOLS



intonation graphs

xxxx

ǎ	rising tone
á	high tone
à	low tone
ā or a	mid tone
ã	nasal vowel
~	fluctuation between two forms (when between two phonetic transcriptions)
n_a	nasalization
N̩	syllabic nasal
C̩	syllabic consonant
ʔ	glottalization or glottal stop
(b̤)	fortis consonant
(b̥)	lenis consonant
(b̰)	extralenis consonant
j	palatalization of preceding consonant
w	labialization of preceding consonant
m	nasalization and labialization of the secondary release (when following double consonant)
CR	consonant and secondary release feature
(.)	short rhythm unit or short word rhythm
(—)	long rhythm unit or long word rhythm
(—=.)	long-short rhythm unit with semi-open juncture
(.=—)	short-long rhythm unit with semi-open juncture
(.=.)	short-short word rhythm with semi-open juncture
(—=—)	long-long word rhythm with semi-open juncture

ABBREVIATIONS

ac	acute
add	additive particle
adj	adjective
aux	auxiliary verb
av	adverb
av pt	adverbial particle
BG	breath group
BW	basic word
C, Con	consonant
Cj	consonant with palatalized secondary release
CL	class
Cm	consonant with nasalized-labialized secondary release
Com	compact vowel or consonant
Comp Par	compound paragraph
Conj	conjunction
cp	completive particle indicating aspect
CR	consonant with secondary release
CRV	consonant-secondary release-vowel syllable type
c/s	centiseconds
ct	continuative particle indicating aspect
CV	consonant-vowel syllable type
Cw	consonant with labialized secondary release
D	descending tone
def	definite suffix on noun
des	desiderative particle indicating mode
Dif	diffuse vowel or consonant
Dis	discourse
dur	duration
emph	emphatic particle
EW	expanded word

Fa,FFa	fast speed, faster*
Foc	focus
F Marg	final margin
fut	future completive particle (tense-aspect)
fut ct	future continuative particle (tense-aspect)
Gr	grave vowel or consonant
GRAM	grammatical
Hi,HHi	high tone/vowel, higher
hort	hortative mode
HS	high-spread vowel
I Marg	initial margin
indef	indefinite suffix of noun
Int	intonation
INTRO	introducer
Lo,LLo	low tone/vowel, lower
lab	labialized
Ld,LLd	loud volume, louder*
LR	long rhythm unit or long word rhythm
M	mid tone or mid vowel; in graphs, medium speed or volume
Marg	margin
MFa	medium fast speed
MLd	medium loud volume
MSo	medium soft volume
MSl	medium slow speed
n	noun
N	nasal vowel, nasal consonant
neg	negative particle
nuc	nucleus
O	oral vowel
ob	object
P, Par	paragraph
p	past tense
pal	palatalized
PHON	phonological
pl	plural
pp	past participle
pr ct	present continuative particle (tense-aspect)
pref	prefix
pro	pronoun
pt	particle
q	interrogative particle
R	rising tone
rel	relative particle
rem p	remote past particle
RG	rhythm group
Ro	rounded vowel
S	sentence
sat	satellite
sg	singular
Sl,SSl	slow speed, slower*
So	soft volume*
Sp	speed
Spr	spread vowel
SR	short rhythm unit or short word rhythm
st	stem
sub-dis	subdiscourse
suf	suffix
syl	syllable
TA	tense-aspect
TAM	tense-aspect-mode
te	tempo
tr	transitive
transc	transcription
transl	translation
V	vowel
v	verb
var	variant
VF	very fast speed
VL	very loud volume
Vol	volume
VS	very soft volume
V seq	vowel sequence

[* In condensed graphs, due to space considerations, abbreviations have been reduced to the initial letter only; i.e., F = fast speed, L = loud volume, S = soft volume, slow speed. --Ed.]

[blank]

INTRODUCTION

This book is written with a hierarchical perspective, beginning with the phonology of the discourse and continuing through seven levels. The four higher levels are described in Part I: **discourse** (chapter 1), **paragraph** (chapter 2), **sentence** (chapter 3), and **phonological group** (chapter 4). Then beginning with minimal units, **phonemes and prosodies** (chapter 5), and **syllable** (chapter 6) are described in Part II, and the **word** is described in Part III (chapters 7-9), ending with the complex word.

The division between the higher levels and the word is convenient because features characterizing the higher levels are quite different from those that characterize the lower ones. The description of the higher levels gives a broad view of the structure and of those features which characterize the larger speech segments. This lays a foundation for references at the word level to variants of features of the word conditioned by the higher-level features overlying them. Lower-level features are best described at the word level. Phonemes and syllables are dealt with briefly first; the description of their variants is given where pertinent in discussing features of the word.

Each phonological level from the word through the discourse is realized with its simple and complex subtypes. The complex subtypes of both the word (sect. 7.2) and the sentence (sect. 3.1) are subdivided into expanded and compound. The simple subtype is described first, and then the complex.

Structure and subtypes are distinguished on the basis of phonologically determined constituents. Each type and subtype has characterizing features. The procedure followed is to describe on each level first the structure (simple and complex) and then the features.

Because there is redundancy of features on various levels, some repetition is unavoidable. In the higher levels, the features are dealt with each time they occur, but they are described in greater detail at the level where they are most clearly realized. However, at the lower levels the features are described on the basic word level, and not on the syllable level. The complex word and the basic word have some features

in common; therefore, there is redundancy in the description of those features that are manifested somewhat differently in each of the two word types. A chart of the complete hierarchical levels and their characterizing features is given in Appendix 1, but these are summarized in the following paragraphs.

Discourse may be simple: a short narrative or a paragraph; or it may be a complex, long narrative comprised of a series of event sequences or chapters. The simple discourse is particularly notable for the feature of intonation which signals its components.

Intonation is movement up or down of the tones of words or groups of words forming an intonation pattern. Within the groups of words realized on the same intonation level, the high, mid, or low tones of the individual words remain in the same relative position to each other and are still distinguishable. Therefore, the intonation pattern overlies the tones but does not invalidate their distinctiveness.

In discourse the two dimensions of intonation are particularly important: (1) the **intonation contour**, which may be terraced or level and which pertains to the high or low realization of the tones; and (2) the **width of intervals between the tones,** which may be wide or narrow. These function to signal the discourse margins and the linking and stressed portions of the discourse body.

Paragraph juncture and **discourse medial juncture** are also important in distinguishing the borders of components of complex discourse and the borders of paragraphs.

The **paragraph** may be simple or compound. At the paragraph level, initial stress and focal stress are important. Initial stress functions with juncture to distinguish between paragraph and sentence on the one hand and paragraph and embedded subdiscourse on the other. ("Stress" is a generic term here used to describe phonological contrast between units, whether manifested by loudness, pitch, or speed of utterance. At the levels above the word, stress is manifested by all of these.)

The **sentence** may be realized as simple or complex; the complex, in turn, may be realized as expanded or compound. Although the feature of intonation is characteristic of every level above the word, intonation contours are most fully realized at the sentence level. Sentence intonation serves two purposes: (1) to convey intention or features of continuity or of change, and (2) to mark the limits of the sentence and its components.

Another feature particularly important at the sentence level is stress. This includes initial stress, complex sentence stress, and focal stress. Initial stress functions to distinguish the sentence from the paragraph and from the phonological group (or grammatical clause). Complex sentence stress functions to distinguish groups of complex subtypes. These may be subtypes of expanded and compound sentences which correspond to grammatical subtypes such as conditional, question-answer, statement-response, indirect quotation, hortatory, serial, etc. Focal stress corresponds to emphasis in grammatical sentences. All three types of stress are manifested by volume, intonation, and speed.

Phonological groups are breath groups, which often correspond to grammatical phrases, and rhythm groups, which often correspond to grammatical clauses. Sentence medial juncture, which is realized as major and minor and is described at the sentence level, marks the borders of rhythm groups. Minor juncture may also occur medially in a rhythm group to mark the borders of breath groups. Terrace intonation also serves to mark the borders of rhythm groups and breath groups. Consonant assimilation is a cohesive feature of both kinds of phonological groups, and tone sandhi is a feature of the breath group.

The **word** is the level below the phonological group. It is realized as two major types: the basic word, in which most of the features of the lower levels are fully realized, and the complex word, which is characterized by complex realization of some features of the word and also by some additional features. The complex word is subdivided into the expanded word and the compound word.

Features that characterize the word are different from those of the group and of higher levels. The **basic word** is characterized by eight features, four of which are distinctive: tone, nasalization, length, and secondary release of consonants. The demarcative features of stress, rhythm, glottalization, and vowel sequences are cohesive features. The initial border of each basic and expanded word is marked by word stress, which is manifested by length of consonant and not by loudness or pitch. The other features of the word are more strongly realized on the stressed nucleus of the word, but they extend over the entire word with diminishing intensity of manifestation.

The **expanded word** corresponds to more than one morpheme. It may include clitics which are postpositions or tense-aspect markers.

In the **compound word**, vowel, consonant, and tone sandhi are characterizing features. Internal open juncture marks the borders between the components. The phenomenon of tone sandhi functions to distinguish the syntactic subtypes of compounds.

The word is the lowest level of semantic units; it is the lowest level at which prosodic features are pertinent. Below the word, syllables, phonemes, and prosodies are briefly described.

The description at each level of the hierarchical structure is necessary in order to set the correct borders of grammatical paragraphs, sentences, phrases, and words, and thus to correctly hear, speak, and write the Senoufo language.

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Part I

THE HIGHER LEVELS

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1 THE DISCOURSE

Discourse, whether simple or complex, is the highest level of the phonological hierarchy. It is the level above the paragraph, comprising one or more paragraphs which are separated by paragraph juncture. It bears initial discourse stress and focal paragraph stress, and is bounded by silence. It is further characterized by the demarcative features of intonation contours, rhythm, volume, paragraph juncture, and the initial and focal stress mentioned above.

1.1 Simple Discourse Structure

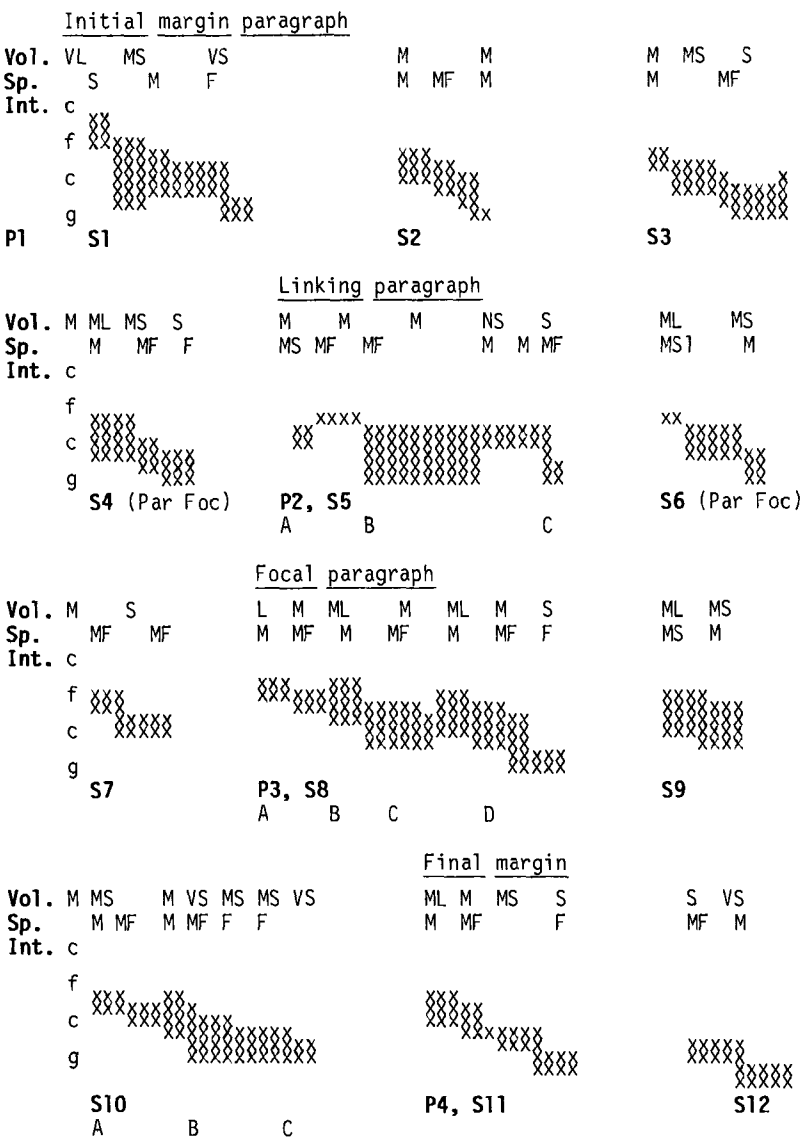
Simple discourse consists of one or many paragraphs. Its components are: initial margin, body, and final margin. These components are identified by the placement of varying degrees of volume and speed, and by intonation contours.

In order to determine the intonation contours, I identified the relative heights of the tones of the words of the discourses on the octonic musical scale, and then drew the intonation scales. The differences between relative heights of men's and women's voices are not noted, but these are transposed onto the same scale. The important distinctions in intonation contours are not between men's and women's voices, but between the tones of words and groups of words within the discourses. The relative degrees of speed (slow, medium, medium fast, fast) and volume (very loud, loud, medium, soft, very soft) are also analyzed and recorded for the individual sentences of the discourses.

The volume, speed, and intonation contours of the personal narrative "The Wagon" are given below in two forms. They are first recorded in a condensed graph, and then in a detailed graph, followed by the free translation.

In the condensed form (graph 1), paragraphs and sentences are indicated. The top edge of each part of the intonation contour block indicates high tone, and the bottom edge, low tone; volume and speed are given above the intonation block. In the detailed graph, the actual pitch of each tone is recorded by circles above the syllables of the transcription. The condensed graphs give an overall view of the features of the entire discourse and a comparison of its components.

Graph 1: "The Wagon"
(sentences condensed)

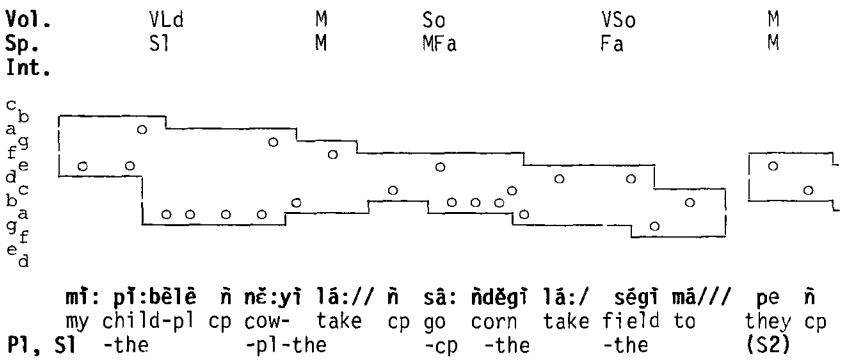


In the condensed form, reading from top to bottom, the following are noted:

* Component parts of the discourse, such as margin paragraph, linking paragraph, etc.
* Volume (Vol) which may be very loud (VLd), loud (Ld), medium loud (MLd), medium (M), medium soft (MSo), soft (So), very soft (VSo).
* Speed (Sp) may be slow (Sl), medium slow (MSl), medium (M), medium fast (MFa), fast (Fa), very fast (VFa).
* Intonation (Int) is indicated by intonation blocks referred to above. The letters at the left of each line of intonation blocks represent pitches on an octonic musical scale. In the condensed graphs, only every third or fourth note of the scale is shown.
* Paragraph (P), Sentence number (S), sentence components (A,B,C,D) in complex sentences, paragraph focus (P Foc), and subdiscourse components are at the bottom.

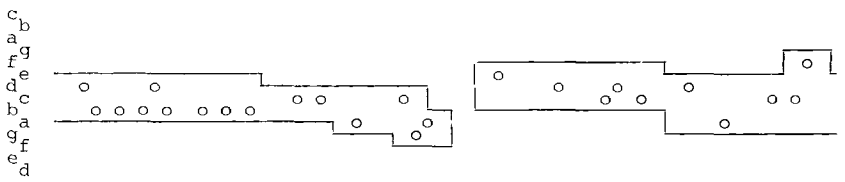
The same system is followed and modified for the detailed graph in which intonation blocks include all the notes of the octonic scale. The tones, written o, are differentiated by their relative heights within the intonation sections, i.e., high tones are situated at the top edge of each section, and low tones at the bottom edge. In the transcription line underneath, the tones are marked over the words. Mid tone is unmarked.

Graph 2: "The Wagon"
(sentences in detail)



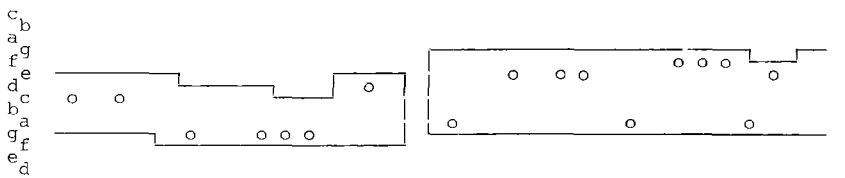
mǐ: pǐ:bēlē ñ nĕ:yī lá:// ñ sâ: ñdĕgī lá:/ sĕgī má/// pe ñ
my child-pl cp cow- take cp go corn take field to they cp
P1, S1 -the -pl-the -cp -the -the (S2)

Vol.	M	M				MLd
Sp.	M	MFa		M	M	M
Int.						



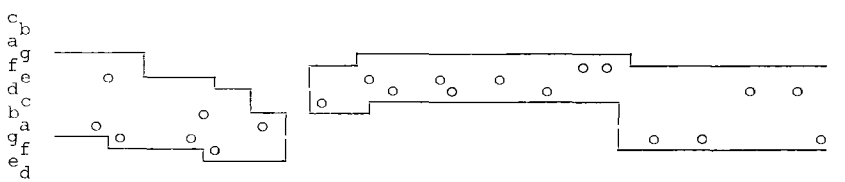
baː ñděgī wōlō ñ tɛ́ʔɛ́ ñ kwɔ́ːː/// á pe nɛ̌yī lá: ñ yiriːː//
come corn take cp put cp finish then they cow take cp come-out
-cp the -out -emph **(S3)** -pl-the -emph

Vol.	MSo	So			M		MLd
Sp.	MFa	MFa			M		MFa
Int.							



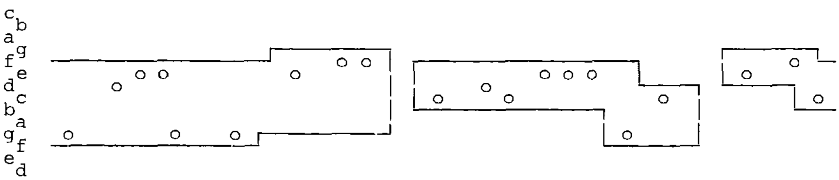
ni ma: lē dèsǐgè mā/// à be yiri yī kūrúgó ābē:
ct come- rel Desinge to and they come them after so
-ct **(S4)** -out

Vol.	MSo			M		M		M
Sp.	Fa	Fa	Fa	MSl		MFa		MFa
Int.								



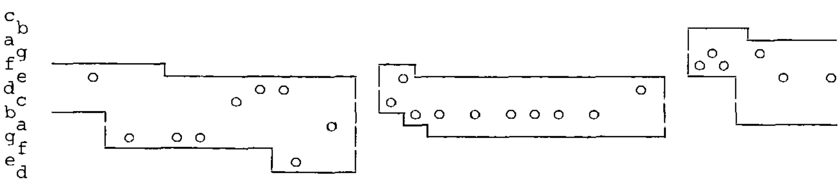
pǐlē pɛ̌ː na# mɛ̀: worò baː ye ñ lúgú lɛ̀// ñ dyo/ worò
child-pl them- on as he come jump cp climb rel cp say he
-the selves **(P2, S5A)** -cp **(S5B)**

Vol. M M MSo So MLd
Sp. MFa M M MFa MSl
Int.



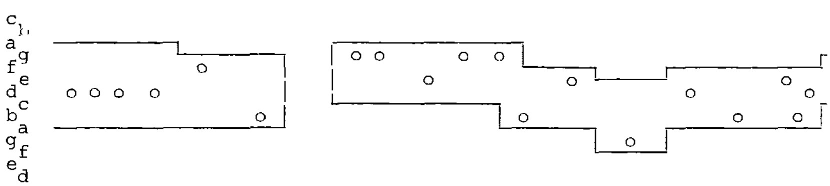
ã wodõrõw̃ tjõ sī lũgũ// ã worò kōlō'ō ǹ to:/// ã kɔ̃gī
fut wagon catch then mount and he miss cp fall and hand
-the **(S5C)** **(S6)** -the

Vol. M So M So Ld
Sp. M MFa MFa MFa M
Int.



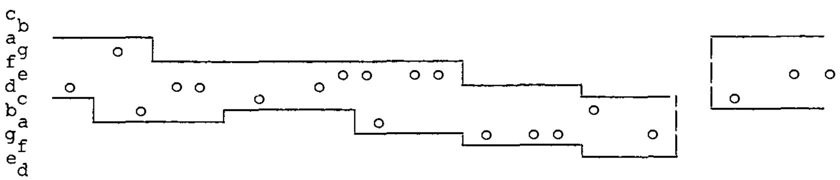
djẽ: ǹ kòrò wodõrõw̃ ni///nɛ̃yī i wi fulolo ni sjẽ:# nɛ̃yī sī i wi
enter cp stay wagon in cow- ct him drag ct go-ct cow but ct him
-the pl-the -pl-the
(S7) **(P3, S8A)**

Vol. M MLd M
Sp. MFa M MFa MFa
Int.



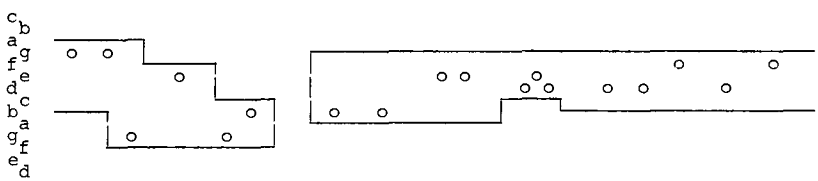
fulolo ni sjẽ: lè// sānī wi yākpōlī wa: lè/ pe gī tjā́:://
drag ct go-ct rel before he voice throw rel they it know
(S8B) -the -emph

Vol. MLd M M So MLd
Sp. M MFa Fa MSl
Int.



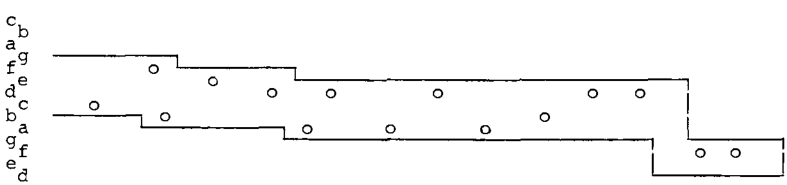
ã kɔ̃gĩ pa'a// ã wodõrõw̃ lũgũ ñ sɔ̃lɔ̃ wĩ na# ã be i
and hand catch and wagon mount cp pass him on and they ct
-the -the **(S9)**

Vol. MSo M M MSo
Sp. M M MFa
Int.

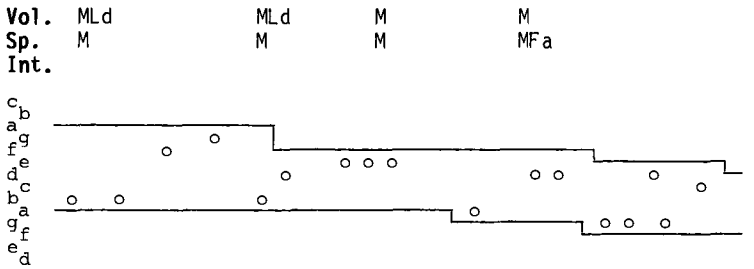


yãkpórĩ wã: ã̀bé:/// ã mĩ: yiri kẽgĩ ni ni fẽ ni sjẽ://
voice throw so and I go-out village in ct run ct go-ct
-pl-the **(S10A)** -the

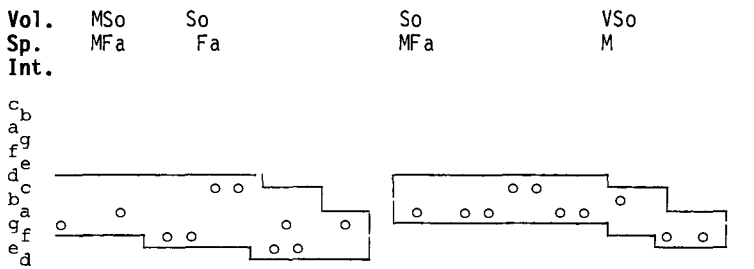
Vol. M MSo MSo VSo
Sp. M MFa Fa Fa
Int.



ñ sâ: wĩ nya: ã̀bé: bẽ mã ã be wĩ lã: ni ma:#
him go-cp him see so them to and they him take ct come-ct
(S10B) **(S10C)**



ã mĩ: wĩ lã: ə̃̀bẽ:/ tẽrĩrẽ// ñ ta?a nɛ̃?ɛ̃sõ̃w na
and I him take so immediately cp place bicycle on
(P4, S11) -the



ñ pã lɔ̃?ɔ̃tɔ̃rɔ̃-kẽgĩ mã/// à lɔ̃?ɔ̃tɔ̃rɔ̃bẽlɛ̀ wĩ dɛ̃̀:mɛ̃###
cp come doctor-village to and doctor-pl him help
-the **(S12)** -the

The Wagon

'My children took the oxen and went and got the corn in the field. They finished getting the corn and putting it away, and they were bringing the oxen back from the corn field. And they were coming along behind them, the children by themselves.

'As he came out and climbed up, thinking he would grasp the wagon and get up, he missed and fell. And his hand caught in the wagon wheel and turned with it. The cows kept on dragging him.

'As the cows were dragging him, before he cried out, they knew his hand was caught and the wagon ran over him. And they yelled so that I came running out of the village and saw him like that with them as they were carrying him to meet me.

'And so I took him right away and placed him on the bicycle and brought him to the hospital. And the doctors helped him.'

1.1.1 The initial margin of a simple discourse may cover either one sentence in a short discourse consisting of a paragraph, or one paragraph in a longer discourse. The initial margin is characterized by discourse initial stress (sect. 1.3.1). Although the discourse stress is concentrated on the first part of the margin, it spreads over the entire margin. In general, the margin paragraph begins higher, louder, and slower than other paragraphs of the discourse, with the possible exception of the focal paragraph.

Normally the intervals between the tones are wider in the initial margin paragraph than in the other paragraphs. Also the sentences of the initial margin are often relatively shorter than the sentences of the body of the discourse. In "The Wagon," the initial margin paragraph contains four sentences, whereas paragraphs 2 and 3 contain three sentences each. The sentences of paragraphs 2 and 3 are long and complex.

The initial margin paragraph normally ends at medium intonation level and has soft or medium volume finally. The final medium intonation is often preceded by low intonation either in the same final sentence or in a nonfinal sentence. In "The Wagon," the intonation descends to a low point but returns to medium level on the final word of the initial paragraph. The final sentence of the paragraph contains the paragraph focal stress, and the intonation and volume drop following the higher intonation and volume of the focal stress. This is a normal occurrence following focal stress (sect. 2.2.3). However, in "The Snake" below, the initial paragraph focus occurs on the second sentence. Sentence 2 begins very high and ends very low, but it is followed by sentences 3 and 4 which begin at medium high intonation level and end medium low. In "The Lizard" (see page 25ff.), the entire initial margin carries loud to medium loud volume until the end of the final sentence when the volume decreases. Even though softer, the speech is still emphatic at the end of the initial paragraph. The final intonation is medium low.

1.1.2 The body of the discourse is its largest part. It may consist of several paragraphs which function as linking or as focal paragraphs.

Linking paragraphs occur between the initial margin and the discourse focus (see page 21f.), and between the discourse focus and the final margin. Linking paragraphs are characterized by medium high to medium low intonation levels, medium to low volume, and medium to medium fast speed. The intervals between tones are narrow.

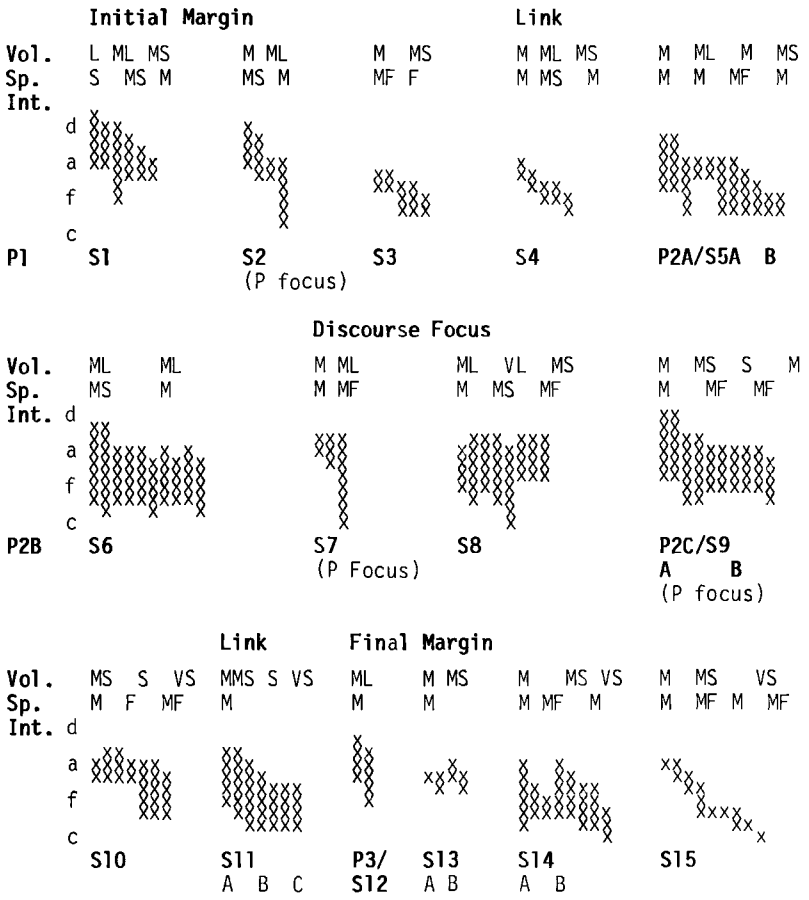
Within each linking paragraph, sentences bearing initial paragraph stress and paragraph focal stress are characterized by higher intonation, wider intervals between tones, louder volume, and medium slow speed. However, the volume at the stress points in linking paragraphs is normally less than in focal paragraphs, and the intonation is not very high. This is illustrated in "The Wagon," in which the initial stress of the linking paragraph 2 is characterized by only medium volume, medium intonation, and medium slow speed. On the other hand, the initial stress of the initial and focal paragraphs is characterized by very loud or loud volume and higher intonation.

Sometimes the linking portions are parts of paragraphs. The graph below of "The Snake" illustrates this. In this discourse, the linking

portion occurs on the first component of the compound paragraph 2, and the focal portion is on the second component. Following the focal portion of the discourse, the second linking portion occurs on the third component of the compound paragraph and on the paragraph following it. The linking portions are characterized by narrow intervals between tones, medium intonation, medium volume, and medium to fast speed.

The focal portion of the narrative occurs in medial or final position in the body in the stories I have studied, but it could also occur in initial position in the body. The focal paragraph bears focal stress, described under features.

Graph 3: "The Snake"
(sentences condensed)



tjã̃ʔã̃nĩw̃ / wi ñ yĩrĩ yaː / tjẽdă:lĩ mã: /// wi mă: sâ: ñdègè
yesterday she cp come there market-court from she remp go-cp corn
P1, S1 -from -the **S2**

sjɔ: yaː/// à wi tjaː ñdẽgĩ djẽ: ñ fɔ̃: ñ kwɔ̃:/// nĩː sĩ
buy there and she anyway corn wash cp soak cp finish then but
S3 -cp -the **S4** -cp

djo tĩ: // worò ĩ sá nyă:nyű̃yà: kɔ̃̄ / lŏgì nyɔ̃: na # bɔ̃ / mĩ: à
say wait she des go grass heads pull water mouth on well I fut
-some -up -the **P2A, S5A**

nĩ: worò wórì djo: /// wi ñ sáː sɔ̃̀-zélígì kɔ̃̄ː // sɔ̃̀-zĩː:-wógìː ///
again her one tell she cp go-cp row-first pull row-two-one
-pl-the **S5B** -the -emph -the-emph

worò ñ sâ: kɔ̃gì lá: ñ tɛ́ʔɛ̀ ñ djo worò à nyă:gì kɔ̃nɔ́ʔɔ́ //
she cp go-cp hand take cp put cp say he fut grass pull
P2B, S6 -the -the

tàmatí:-nyű̃gì lá:rá ni/// dɔ̃ʔɔ̃ wàbìgà i yaː /// à worò sáː wàbigì
tomato-head under- in maybe snake ct there and she go-cp snake
the neath **S7** **S8** -the

pínɛ́ ñ lá: yaː // ni nyă:gì nĩ /// à wàbigì fala ñ fí:gé ñ
join cp take there then grass with and snake continue cp swing cp
-the **P2C, S9A** -the

wĩ nɔ̃ nĩ̋gì bé:le ni // à wi gí kàrìgà ñ wá: /// nĩː sĩ
her bite midst that in and she it turn cp throw then but
the **S9B** **S10**

wàbigì kpó: nĩ kàmigì nĩ /// nĩː sĩ kárí lɔ̀ʔɔ̀tɔ̀rɔ́-kàʔà má //
snake kill then hoe with then but go doctor-village to
-the -the **S11A** -cp

à be sáː wĩ pĩ:gé // ă wi lűrú ñ pã kàtjó:lĩ má ///
and they go-cp her inject and she turn cp come courtyard to
S11B **S11C** -the

mìː sá: mjɛ̃̀ː gĩ tjã̃ ĩ /// mì: ñ yìrì yaː làkɔ̀líw̃ má //
I but-emph-neg also it know neg I cp leave there school from
P3, S12 -cp **S13A** -the

nĩ baː kɔ̃gì nya: wobwɔʔɔ̀ nĩ /// à mì: sĩ mjɛ̃̀ː wĩ yíbé
then come-cp hand see one-wrap with and I but also her ask
S13B the **S14A** -cp

à wi djo ǹtjã̃ wàbìgà gi sáː worò nɔ̃ yāː /// wi sĩ mă:
and she say know snake it go-cp her bite there she but remp
S14B **S15**

nī̃ː djo / worṑ i sjḗ: nīdjā̃ʔā̀̃ lɔ̃ʔɔ̃tɔ̃rɔ̃-kāʔā mā́ ###
again-cp say she ct go-ct today doctor-village to

The Snake

'Yesterday she came from the market. She had gone to buy corn there. And anyway, she washed and finished soaking the corn. But then (she) said, wait, she would pull out the grass near the water.

'Well, I'll tell it like she said. She weeded the first row, the second one, she put her hand down thinking to pull out the grass at the base of the tomatoes. Maybe a snake is there. And she picked up the snake with the grass. And the snake swung around from its midst and bit her, and she threw it away. But then (she) killed the snake with the hoe. But then (she) went to the hospital and they gave her an injection, and she returned home.

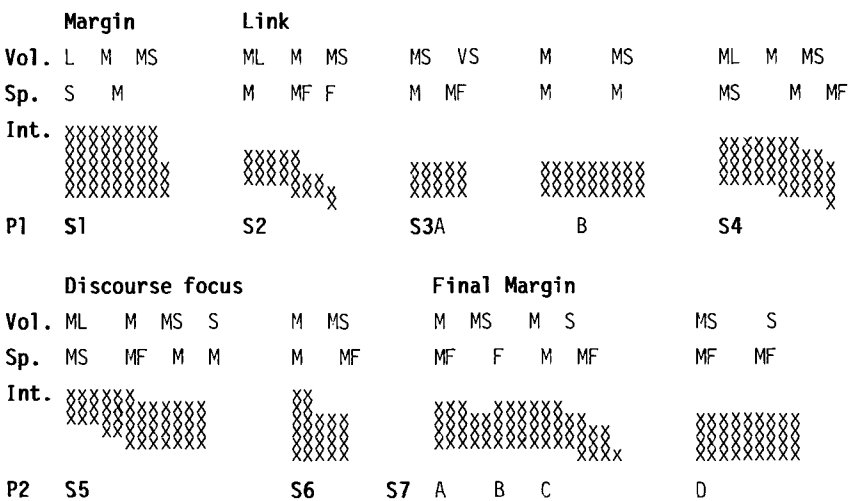
'But I didn't know it at all. I left school and came and saw her hand bandaged. But I also asked her and she said that it was a snake that bit her. But she said also that she is going to the hospital today.'

1.1.3 The final margin of the discourse may be simple or complex. The simple final margin may consist of a paragraph or a part of a paragraph with diminishing volume, accelerated speed, and intonation descending to a very low level. In "The Wagon," the simple margin is paragraph 4, which begins at a high intonation level and descends by steps. It contains two sentences. The first sentence descends to a low intonation level from medium high; its volume diminishes from medium loud to soft, and its speed accelerates quickly from medium to fast. The final sentence begins at a low intonation level and descends lower; its volume begins soft and decreases to very soft, but its speed begins medium fast and slows to medium on the final word.

The complex margin may consist of two parts, each of which may be a paragraph or a part of a paragraph. When there is a moral to the story, the first part of the margin is the final margin of the story, and the second part is the moral. Also a final closing line may be added, saying the story is ended. This usually carries medium or low pitch and medium soft volume. The complex margin resembles the simple margin, but it usually does not descend as low. Complex margins occur in "The Ruler and His Son" and in "The Lizard."

The final margin of a hortatory discourse may be medial in intonation, volume, and speed. It probably will be lower in intonation, volume, and speed than the preceding part, but not extra low. An example of this is the discourse "Speak with Your Child."

Graph 4: "Speak with Your Child"
(sentences condensed and transcribed)



da nyu: nî pĭ:w̃ nî /// mì: ñ wî nya: à wi pɔ̃w̃ lá: ñ
fut-ct speak-ct with child with I cp him see and he dog take cp
Pl, S1 -the **S2** -the

le lŏgî ni // bàrìkógî lɔ́ʔɔ́ ni /// à mì: wî yíbé // à
put-in water in barrel-the water in and I him ask and
-the **S3A** **S3B**

wi gî tjê: /// kàdjá / mì: ñ gî tjã̄ worò wi wî lá: ñ le ya:̀
he it refuse however I cp it know he him take cp put-in there
S4

wi gá mă: pje mì: wó: // mì: à dé: wî kpmɔ̃́: /// wi sô: mì:
he emph remp be my one I fut ought him hit he but-pr my
P2, S5 **S6** -neg

wó: ĭ /// korò na mì: ñ pã̄ ba gi djɔ: mɔ má // mɔ ĭ da nyu:
one neg that on I cp come come it say you to you des ct speak
S7A -aux -sg -sg

nî wi nî // wi à nî kɔ́ gê: bé: félégé kpéʔélé ĭ ###
then him with he fut again yet that there kind do neg

Speak with your Child

'Speak with your child. I saw him put the dog in the water, the barrel water. And I asked him (about it) and he denied it. However, I know he put him in there.

'If he were mine, I would certainly beat him. But he isn't mine. Therefore, I came to tell you about it so you can speak with him so he won't do that kind of thing again.'

The above hortatory discourse ends with medium volume and at medium intonation level, both because this is a hortatory sentence and because the focus of the sentence is on the last part. For a description of intonation in the hortatory discourse, see section 1.3.2.

How-to-do-it discourses end at a medium low volume and intonation. A final sentence is added by the learner: "I hear it." This is softer and lower than the rest of the final margin.

In televised news broadcasts, the final margins are not normally as low as the margins of some paragraphs in the discourse body. However, the news discourse may end with a sentence of low or medium low pitch in which the announcer signs off.

A conversation discourse which is terminated by "goodbye" ends with low volume and intonation since the final sentence is the response to the goodbye. Responses are normally softer and lower than the preceding sentence.

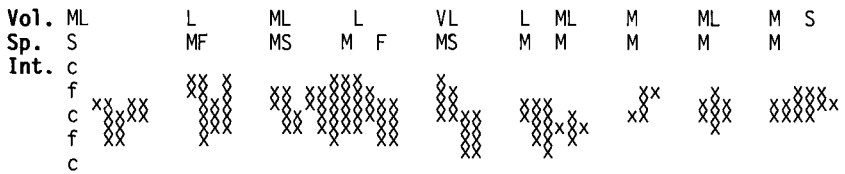
In summary, the simple discourse normally progresses from high intonation, loud volume, and slow speed to medium intonation, medium volume, and medium to fast speed. It rises to a peak of intonation, loudness, and slow speed at the focal point, and then quickly diminishes. The final margin normally has lower intonation, softer volume, and faster speed than the body of the discourse.

1.2 Complex Discourse Structure

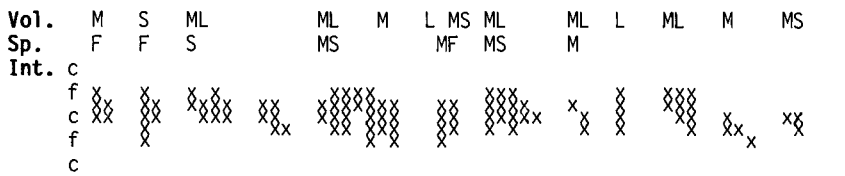
Complex discourse consists of two or more subdiscourses linked by discourse medial juncture (sect. 1.3.4). The complex discourse, like the simple discourse, has three component parts: the initial margin, the body, and the final margin. In the complex, however, the initial margin and the body are longer than those of the simple discourse. The accompanying example from "The Ruler and His Son" has in it four subdiscourses, part of a fifth, and part of the final discourse. This is just a little more than half of the entire complex discourse which consists of seven subdiscourses. To conserve space in graph 5, only the intonation blocks, each one representing a sentence, are given along with relevant data on volume and speed.

Graph 5: "The Ruler and His Son"
(sentences condensed)

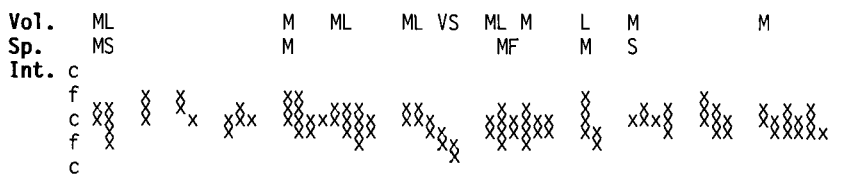
Subdiscourse 1: Initial Margin



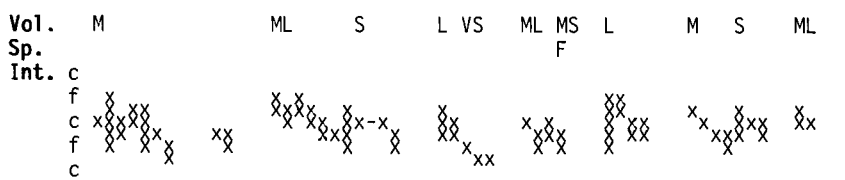
Subdiscourse 2: Link



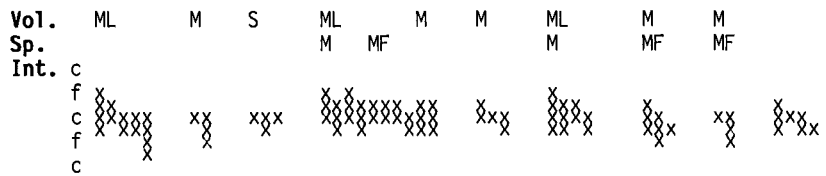
Subdiscourse 3

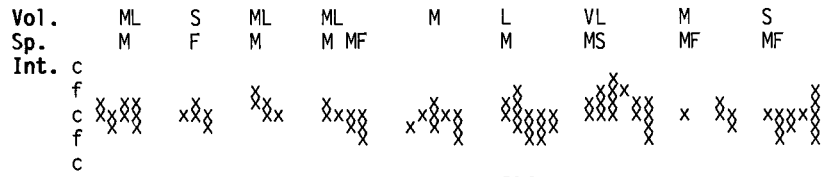


Link **Subdiscourse 4**

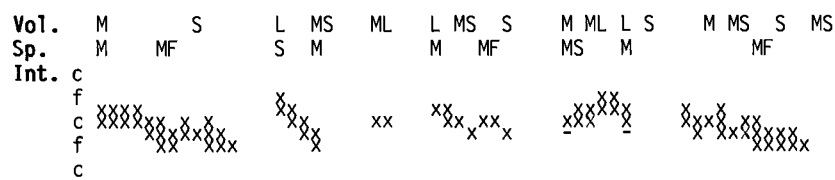


Focal discourse

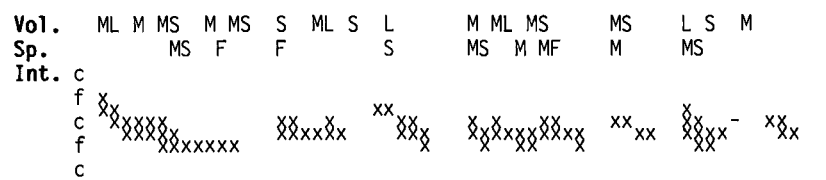




Subdiscourse 5: Link



end of final subdiscourse 7: Final margin



Briefly, this is a story about a ruler who beats his wife. In the first subdiscourse, his son asks him why he didn't see what she was like first and then take her. His father says he himself would straighten up, but his son should be sure to test his own wife first and then take her. The first subdiscourse is the initial margin of the complex discourse.

The second, third, and fourth subdiscourses are about the son's adventures in three different villages as he tries to find a wife. The fourth is the focal discourse because the son finds the right girl.

The fifth, sixth, and seventh subdiscourses are about the son's bringing the girl home, and the ruler's trying to trick the girl and bring shame on his son, then finally admitting that he has found a good wife.

The final paragraph of the last subdiscourse is the final margin of the complex discourse. It ends with a moral that everyone should test his wife well first and then take her.

Phonologically this is an interesting discourse because of the two different types of discourse medial juncture within it. One type of juncture links the parallel subdiscourses 2, 3, and 4. These occur while the son is searching for a wife. The same events occur in each of the parallel subdiscourses. Another type of juncture links the serial subdiscourses 1 and 2, and 4, 5, 6, and 7.

The component parts of the complex discourse, like those of the simple discourse, are identified by the phonological criteria of degree of volume, speed, higher and lower intonation, and wider or narrower intervals between tones.

1.2.1 The initial margin of the complex discourse may consist of the entire first discourse or of part of it. Discourse initial stress (sect. 1.3.1) is manifested on the first paragraph of the first subdiscourse. This spreads to the rest of the subdiscourse, becoming less strong toward the end. For an example of this, see the first paragraph and part of the second in "The Ruler and His Son." The intonation blocks show that most of the sentences begin higher and end lower than sentences in the following discourses. The volume is normally correspondingly louder when the intervals between tones are wider apart. However, the main difference is in the intonation spread. Intervals between intonation levels of high tones (see the top lines of each graph) are greater in the first subdiscourse than in the second and third. The same is true for differences in intonation levels of low tones (see the bottom lines of the graphs).

The initial subdiscourse ends on a medium intonation level unlike most simple discourses, indicating that something follows. However, the final phrase has soft volume and fast speed, as simple discourses do.

1.2.2 The body of the complex discourse may consist of one or more subdiscourses. In "The Ruler and His Son," the body consists of five subdiscourses and most of the seventh. (The sixth subdiscourse and part of the seventh are not included here.)

Each subdiscourse within the body has all the characteristics of a simple discourse: initial discourse stress, discourse focus, and final margin. However, the final margins do not normally descend to a low intonation level within the body, but end at a mid intonation level, signaling a following discourse. They usually have the other final margin characteristics, however: low volume, faster speed, and narrow intervals between tones.

Each subdiscourse functions as part of the complex discourse body, just as paragraphs function as components of the simple discourse body. Some subdiscourses function as links between the initial margin and the focal point of the discourse, and between the focal point and the final margin. In "The Ruler and His Son," the two linking discourses, numbers 2 and 3, are mostly at medium intonation level without the wide spans between intonation levels that are seen in the initial discourse.

The focal part of the complex discourse may be a complete subdiscourse. Focal stress, which resembles initial discourse stress but with more spread between intonation levels, affects the entire focal subdiscourse up to the focal point of the focal subdiscourse.

In "The Ruler and His Son," the fourth subdiscourse is the focal subdiscourse, the first half of which carries strong focal stress. This stress is not as strong as the initial stress on the initial subdiscourse. The strongest focal stress, however, is on the focal point of the focal subdiscourse, and is marked focus under the second line of sentence graphs. The focus sentence has very loud volume, medium slow speed, and a wide span between the highest and lowest points of the sentence. (The focal sentence of the initial margin subdiscourse has an even greater span, however.)

The focal subdiscourse, like either a focal sentence in a paragraph or a focal paragraph in a simple discourse, is signaled by an extremely low intonation level in the prefinal sentence of the subdiscourse preceding it. In "The Ruler and His Son," the prefinal sentence of subdiscourse 3 is long and constitutes a paragraph, as does the final sentence.

After the focal point of the focal subdiscourse, volume is reduced, speed is accelerated, and intonation returns to medium pitch. Following that are linking subdiscourses which link the components of the body of the discourse.

1.2.3 The final margin of the complex discourse is like the final margin of the simple discourse, but may be longer.

The final margin of "The Ruler and His Son" includes the prefinal and final paragraphs of subdiscourse 7, the final subdiscourse. The prefinal paragraph tells how the wife of the ruler's son passes the final test. The final paragraph shows the ruler's astonishment as he admits the son really tested his wife well. Then the moral of the story is given: that every man should test his wife before taking her. The final sentence is: "That's all."

The final margin begins with the prefinal paragraph which begins high and descends to low. It ends at medium low intonation. The prefinal paragraph is medium loud initially and soft finally. Its speed is medium, then medium slow, and finally fast.

The final paragraph of this margin begins medium high, becomes medium to medium low, and ends at medium intonation. The speed is from slow to medium slow and ends fast. The volume begins loud and ends medium soft. The climax of the final paragraph is the prefinal sentence, which is the moral of the story. This begins high and ends medium low. The width of

intervals between tones is medium to narrow. The widest intervals are at sentence and paragraph focal stress points. Except for the initial sentence of each paragraph and the prefinal sentence carrying the focal stress, the sentences begin on a lower intonation level than do most in the other subdiscourses. The overall intonation level of high tones, then, is lower in the discourse final margin than in the initial margin or in the body of the complex discourse.

1.3 Features of the Discourse

The features of the discourse are demarcative and serve to unite and identify its components. Most of them occur also at the paragraph and sentence levels, so are presented only briefly here where they serve in ways peculiar to the discourse, then a fuller description is given at the sentence level. These features include discourse initial stress, complex discourse medial stress, discourse focal stress, intonation, paragraph juncture, and complex discourse medial juncture.

Initial stress, focal stress, and intonation function also at lower levels, but paragraph juncture and discourse medial juncture are demarcative features only at the discourse level. Other types of juncture occur at the lower levels.

1.3.1 Stress may be initial, medial, or focal in discourse. Discourse initial stress occurs at the beginning of each discourse, whether simple or complex. In simple discourse, initial stress occurs, but not medial. It is strongest on the first sentence and spreads over the entire first paragraph and sometimes into the second, after which it diminishes. In complex discourse, it is strongest at the beginning of the first paragraph and spreads to about the middle of the first subdiscourse.

(1) Discourse initial stress is realized as:

* very high intonation on the initial or second sentence (often the highest intonation in the discourse);
* wide intervals between tones within intonation units and between them;
* loud volume on the initial words of the first sentence, and medium to loud volume on the first paragraph with the exception of the final paragraph margin: in complex discourse this continues past the first paragraph and over part of the first discourse;
* slow speed on the first sentence of the first paragraph, and slow to medium speed with intensity and clear articulation on the remainder.

The discourse examples presented earlier in this chapter illustrate the realization of stress. In "The Wagon" (graph 1), the highest point in the discourse is on the first words of the first sentence where initial stress occurs. This is also the loudest and slowest portion. Each of these characteristics diminishes to the end of the initial paragraph.

In "The Snake" (graph 3), initial stress is realized most strongly on the first two sentences of the first paragraph, after which it diminishes. These two sentences begin higher than any other sentence of the

discourse (except one in the focal paragraph). The second sentence has a wider span of intonation than any other sentence. The loudest volume and slowest speed occur on the first part of the first sentence.

In "The Lizard" (graph 7), the initial paragraph begins loud and slow, and continues loud, medium loud (and emphatic), and mostly medium slow throughout the first paragraph. It ends accelerated and with soft volume on the final margin of the introductory paragraph.

In "The Ruler and His Son" (graph 5), discourse stress for the complex discourse is realized most strongly on the initial paragraph, after which it diminishes to the end of the subdiscourse. The intonation graphs of individual sentences in subdiscourse number 1 demonstrate a wider span of intonation levels than in sentences in parallel parts of subdiscourses 2 and 3. The intonation graph covers a wider span of tones in the margin portion (sentences 1 and 2) in subdiscourse 1 than in the margin portions in subdiscourses 2 and 3. The linking portions normally manifest very narrow spans of intonation levels compared to those of the initial margin and focal parts of the discourse. However, in the initial margin discourse, the linking portions cover a wider range of tones than do the linking portions in 2 and 3. This is due to the initial discourse stress, which in the complex discourse spreads over most of the first subdiscourse.

(2) Discourse medial stress occurs in complex discourses on the initial paragraph of each noninitial subdiscourse. It is normally not as high nor as loud as the initial stress of the complex discourse. However, the initial paragraph of a subdiscourse normally begins no lower than other paragraphs in the subdiscourse.

(3) Discourse focal stress occurs on the focal paragraph of the simple discourse. In the complex discourse, focal stress is manifested on most of the focal subdiscourse. The focal stress point may be higher and louder than the initial subdiscourse stress (see graph 5).

The focal portion (paragraph or subdiscourse) is normally preceded by a sentence with a very low final intonation level which is often followed by a sentence or part of a sentence with medium intonation. In "The Wagon," this is illustrated in sentences 6 and 7, which precede the discourse focal paragraph. In "The Ruler and His Son," the focal subdiscourse is preceded by two paragraphs of one long sentence each. The first descends to a very low final intonation level, and the second, immediately before the focal subdiscourse, is realized on a medium intonation level. This gives the low mid intonation signal which normally precedes the focal portion of a discourse.

Discourse focal stress, like discourse initial stress, is realized as loud volume, slow speed, and high intonation, with wide intervals between tones and between intonation unit levels.

The discourse focal paragraph or subdiscourse is identified by the stronger initial stress. It often begins at a higher intonation level than do other paragraphs except the discourse initial paragraph. It also begins with medium loud to very loud volume and medium to medium slow or slow speed (see sentence 8, paragraph 3 in "The Wagon"). In this discourse, the focal paragraph consists of three sentences. The focal point

of the focal paragraph is from sentence 8B through sentence 9 and is characterized by a wider interval between tones and between intonation levels, medium loud intonation, and medium to medium slow speed on the sentence nuclei. Often these realizations of stress increase up to the focal point of the focal paragraph, after which the intonation descends, the volume decreases, and the speed gradually accelerates.

In hortatory discourse, the intonation is fairly level, but following the discourse focus it descends slightly. The interval between tones narrows and the speed increases following the focal stress (see "Speak with Your Child," graph 4).

The complex discourse has a focal subdiscourse which is structured like all discourses, having initial margin, linking portions, and focal part. The initial margin has stronger initial stress than linking subdiscourses have. In "The Ruler and His Son," the linking section within the focal subdiscourse remains at a medium high intonation level up to the focal paragraph, and the interval between tones is narrow. However, the focal paragraph begins loud and is very loud at the focal point. The spread of intonation levels on the focal sentence is very wide from the highest to the lowest point. Following that, the subdiscourse sentences decrease in volume and increase in speed, and the intervals between tones become narrow again. The focal stress portion of the complex discourse, then, is like the focal stress in the simple discourse except that it occurs on a subdiscourse of several paragraphs rather than on one paragraph.

1.3.2 Intonation is a demarcative feature of discourse, but at the sentence level it is a distinctive feature. It is described in detail in chapter 3.

The functions of intonation at the discourse level are:

* to identify the components of discourse;
* to distinguish stressed portions from linking ones;
* to distinguish semantic features, such as hortatory and narrative discourses; and
* to distinguish different types of discourse medial junctures and paragraph junctures (sects. 1.3.4 and 1.3.3).

Intonation has already been described in relation to discourse structure and the features of initial stress and focal stress. Its semantic function is described here. Intonation in relation to juncture is described in the next two sections.

Intonation at the discourse level functions to distinguish semantic types of discourse such as narrative and hortatory. In general, all types of narratives have an overall terrace intonation contour (page 50), whereas hortatory discourses, the television news, and visits and conversation discourses have an overall level intonation contour (page 53). An example of level intonation contour is given in "Speak with Your Child" (graph 4). In that discourse, there is some terrace intonation because the story is told of what happened, and comment is made about it.

Different types of sentences within level discourse may have terrace intonation, but at the discourse level, the overall level intonation contour is manifested by the very small gradations of descending tone. Here, intervals between levels of intonation units are very small. Furthermore, the final margin does not descend to a low point as it does in narratives.

In conversation discourses, response sentences are at a lower level than the statements or questions to which they respond. However, the entire intonation contour is relatively level. Within a conversation discourse, a personal narrative often occurs, which has strong terrace intonation. However, on resumption of conversation and in the farewell, although there is some descent in the final response, the overall intonation is more level.

Examples of terrace intonation are given in "The Wagon," "The Lizard," "The Ruler and His Son," and "The Snake." In these examples, most of the sentences are narrative type and carry terrace intonation (page 50). Although level intonation may occur on some sentences in conversation and commands within the narrative, the narrative itself carries overall terrace intonation in that it has a very high initial margin and a low or medium low final margin.

1.3.3 Paragraph initial juncture is a demarcative feature in discourse because it separates the paragraphs. It is realized as a pause which is normally long, but may sometimes be short, and which is preceded by a phrase bearing final low intonation, soft volume, and fast speed. This juncture is followed by a phrase bearing initial high intonation, louder volume, and slower speed than the final part of the preceding phrase.

Paragraph initial juncture has the same characteristics as sentence juncture (sect. 2.2.5), but is normally longer. Paragraph stress (sect. 2.2.1) which follows paragraph juncture is normally stronger than sentence stress (sect. 3.2.1).

One evidence of paragraph juncture is its effect on strong ascending terrace intonation which procedes from low preceding the juncture to high following it. Another evidence is the contrast between soft volume and fast speed preceding the juncture and loud or medium loud volume and slow speed following it. This is illustrated in "The Lizard" (graph 7, paragraphs 2, 3, and 4). The juncture preceding paragraph 2 is not crossed by extra strong ascending intonation, since the difference in intonation levels across sentence juncture between the end of sentence 3 and the beginning of sentence 4 is greater than that across paragraph juncture between the end of sentence 4 and the beginning of sentence 5. However, the other two features, great volume increase and sharp decrease of speed across the juncture, help to identify the paragraph juncture preceding paragraph 2. The juncture between sentences 3 and 4, on the other hand, is not paragraph juncture because the characteristic of decrease in speed does not occur: sentence 3 is medium slow and sentence 4 is medium and accelerated.

Paragraph juncture and complex discourse medial juncture are differentiated phonologically largely by intonation differences. However,

within a complex discourse, paragraph junctures are normally followed by less loud paragraph stress than are discourse medial junctures.

1.3.4 Discourse medial junctures occur between subdiscourses of a complex discourse. Two types of discourse medial juncture occur: parallel and serial. Discourse medial juncture is realized as a long pause preceded by medium intonation and medium soft volume, and followed by a sentence bearing initial high intonation on the high tones, loud volume, and slow speed.

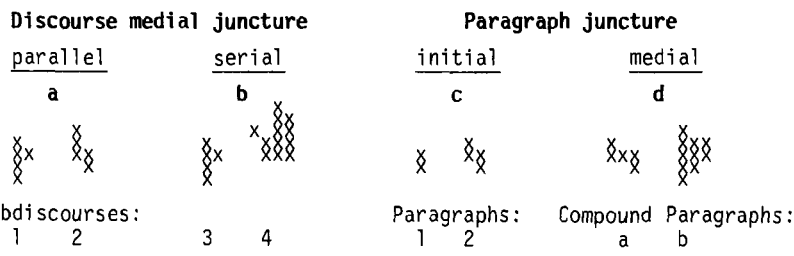
Discourse medial stress always follows discourse medial juncture. The loud volume and slow speed which characterize discourse medial stress are as loud as, or louder and slower than, those of initial stress of most paragraphs within the same subdiscourse.

Discourse medial juncture is distinguished from paragraph initial juncture either by the level intonation of the low tones across the juncture between parallel discourses, or by the very high tone and slow speed following a serial medial juncture (see below).

Paragraph initial juncture, on the other hand, is followed by paragraph initial stress which normally carries less high intonation than discourse stress, and which is normally realized softer and sometimes faster. Paragraph initial stress is realized with higher intonation on both the lower and higher tones than that of similar tones of the final phrase of the preceding paragraph, but secondary paragraph stress is realized as lower intonation on the low tones and higher intonation on the high tones than the intonation of similar tones of the preceding phrase.

The graph of intonation across junctures (graph 6) shows the differences between parallel and serial discourse medial junctures and between paragraph junctures.

Graph 6: Intonation Across Junctures



The illustration given for the compound paragraph medial stress (part d in graph 6) occurs in the focal subdiscourse of "The Ruler and His Son" (paragraph 13B). Because it is a focal subdiscourse, the intervals between tones are wider than in the other examples. In each example, the first figure shows the final intonation of the preceding sentence, and the second figure shows the intonation of the new subdiscourse or paragraph.

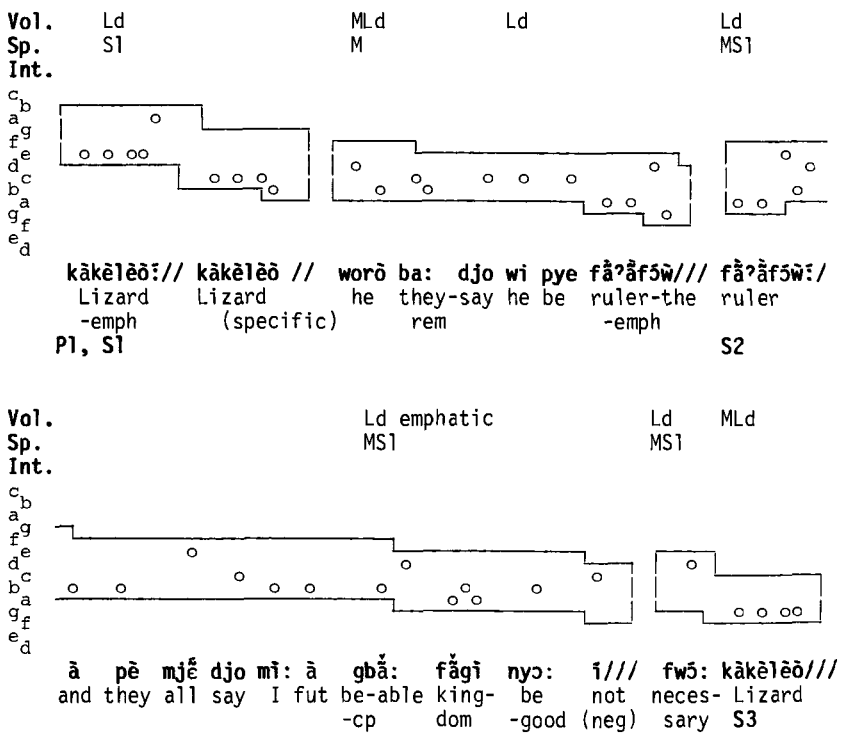
(1) Parallel discourse juncture occurs between subdiscourses which describe parallel events or subevents within a greater event. In "The Ruler and His Son," parallel discourse juncture occurs between subdiscourses 2, 3, and 4: events within the event of finding a wife.

Parallel discourse medial juncture is characterized by the strong rising terrace intonation of high tones across the juncture and by the simultaneous level intonation of low tones across the juncture. It is also followed by a paragraph containing louder volume and slower speed on its initial sentence than those on the initial sentences of most other paragraphs of the discourse.

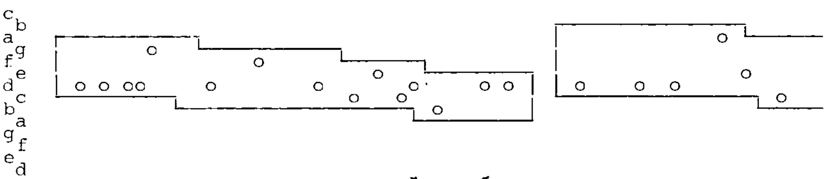
(2) Serial discourse juncture occurs between subdiscourses which describe a series of consecutive events. In "The Ruler and His Son," it occurs between subdiscourses 1 and 2, and between 4 and 5.

Serial discourse juncture is followed by a stronger realization of the stress characteristics of loudness and slowness than that following paragraph juncture. It is also followed by rising terrace intonation of both high and low tones across the discourse juncture.

Graph 7: "The Lizard"

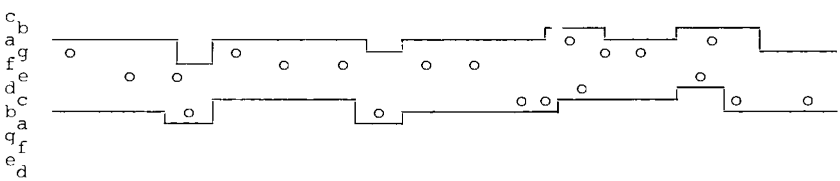


Vol. MLd SSo Ld
Sp. MFa emphatic MSl emphatic
Int.



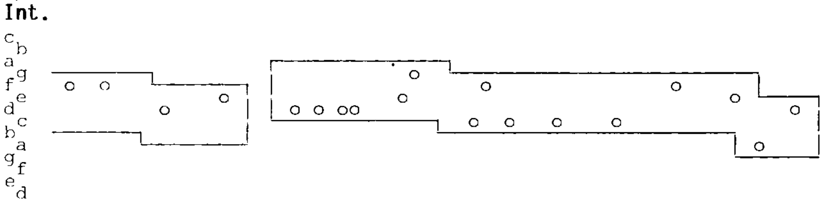
kàkèlèòː// mɔ sí i ǹdɔ̃́nyɛ̃̌ːgì tɔ̃̌gí # à pjèːlè sí baː
Lizard you but pr-ct hat-red cover and Rabbit but come-cp
-emph -the ct
S4 **P2,S5**

Vol. MLd SSo MLd MLd
Sp. FFa FFa MFa
Int.



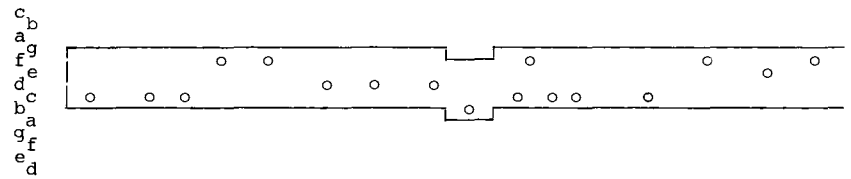
wí pje yɔː// ń: mɔ djo lè mɔ wi fà̃ʔà̃fɔ̃́w̃ː// a pí:lè bɛ̀ː
him tell emph oh you say rel you who ruler-the and child-pl agree
-emph -the

Vol. So MLd MSo So
Sp. Fa MFa Fa
Int.



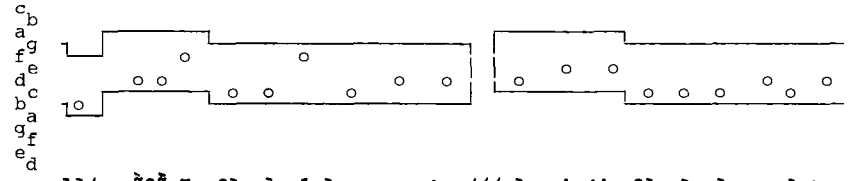
lé ní mɔ ní/// kàkèlèò djoː// pí:lè ǹ bɛ̀ː ní worò ní///
q then you with Lizard say child-pl cp agree then him with
S6 -the (spec)

Vol. MSo MSo
Sp. FFa Fa MFa
Int.



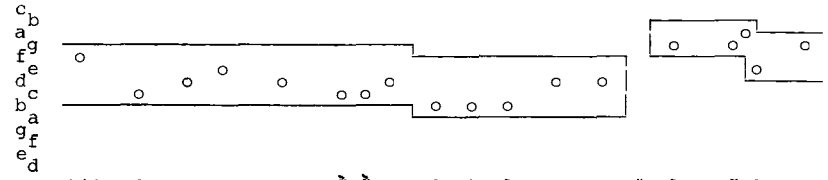
///à pjê:lê sí wí pjo mɔ djo lè/ pǐ:lê ñ bɛ̀: nî mɔ nî
and Rabbit but him tell you say rel child cp agree then you with
S7 -sg -pl-the

Vol. MLd emphatic SSo MSo
Sp. MSl M FFa MFa
Int.



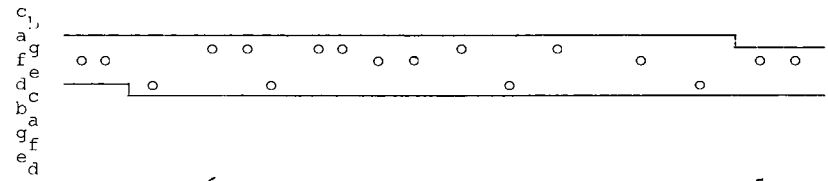
lè/ nyɛ̀ʔɛ̃̀nã̀ fɛ̀:rɛ̀ sí à mɔ ta:/// à wi djo fɛ̀:rɛ̀ à worò ta:
rel tomorrow shame but fut you get and he say shame fut him get
S8

Vol. SSo SSo LLd
Sp. FFa FFa SSl
Int.



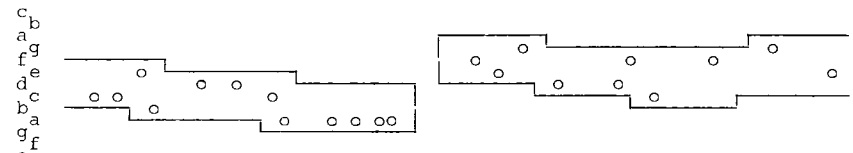
í// à wi wí pye nyɛ̀ʔɛ̃̀na fɛ̀:rɛ̀ à mɔ ta: # à nyǐgì gá
neg and he him tell tomorrow shame fut you get and cool emph
-the -cp
P3, S9

Vol. MLd MLd MSo
Sp. MFa MFa MFa
Int.



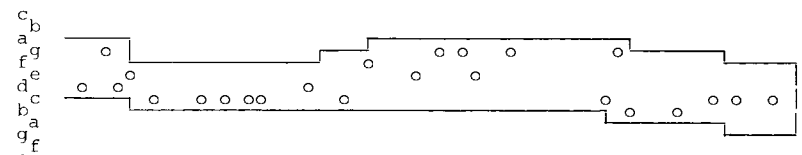
tali/ pɛ̃ mjɛ́ sɛ̃gì yáwɛ̃:rɛ̃ i sjɛ̃: ñ sá ni wĩ sjã̄:rĩ //
near they all field animal pr go cp move- pr-ct him greet-ct
(v) -the -pl -ct toward
aux

Vol. So VSo Ld MLd
Sp. FFa Sl MFa
Int.



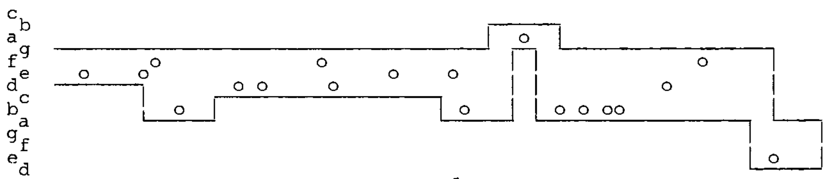
fɑ̀ʔɑ̈fɔ̃w̃ sjã́:rí yaː/ kàkɛ̀lɛ̀ɔ̃ # tjãgàː//à pĭ:lɛ̂ sĩ kɔ̃ ni
ruler greet there Lizard day-one and child-pl but even pr-ct
-the -emph -the
P4 S10

Vol. SSo LLd VLd So
Sp. FFa SSl Sl
Int.



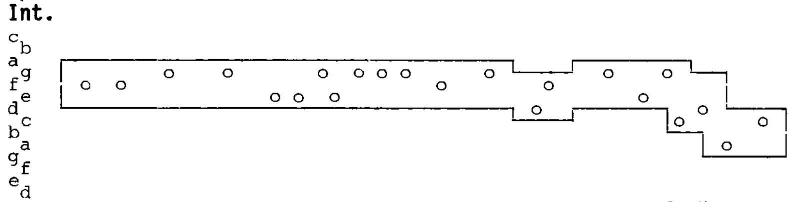
sɔ̀lɔ́ːmì kàkɛ̀lɛ̀ɔ̃ nya: ãbɛ̃: wozínɛ́ɔ̃ nĩ// bwɔ̃:w̃ ñdjoʔo ni///
pass and Lizard see so repose with log-bench top in
-ct-emph -the

Vol. MLd LLd
Sp. Sl FFa Sl
Int.



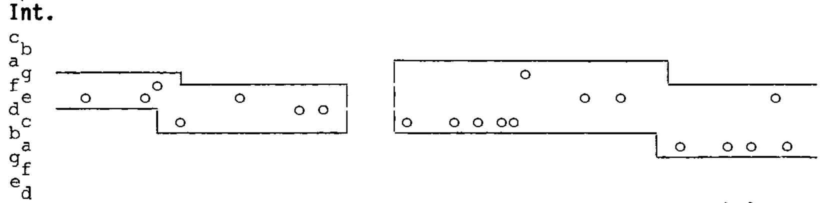
à pī:lè kòrò nī: djo hɛ̋:/ djo kàkèlèò wī nā: wè:///
and child-pl stay then say ha! say Lizard he here that
S11 -the -cp emph

Vol. SSo SSo
Sp. much FFa FFa
Int.



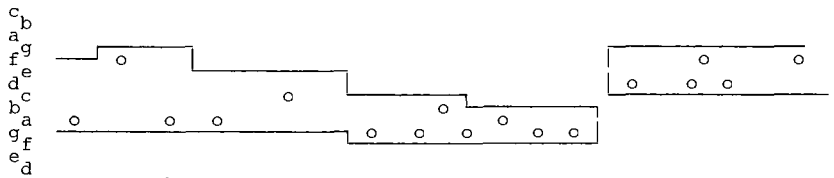
ki i nā: nī kàkèlénbálaga gi nā: gè: / nī ǹdɔ̃nyɛ̌:ǹ nī///
it pr here then lizard-male it here that then hat-the with
-ct -one
-emph

Vol. MLd LLd Ld emphatic less Ld
Sp. MSl FFa Sl FFa
Int.



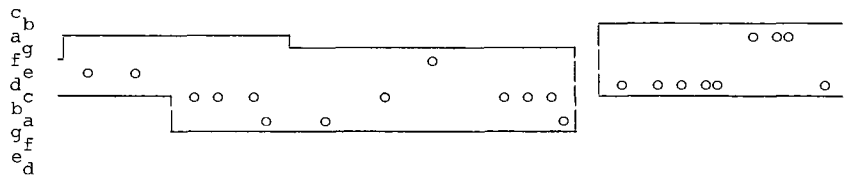
à pī:lè wí tjeri/// à kàkèlèò:// mɔ̃ wi lè fà̃ʔà̃fɔ̃w̃ /
and child-pl him cut and Lizard you who rel ruler
S13 -the **S14** -emph -the

Vol. MLd diminishing So MLd
Sp. FFa MFa
Int.



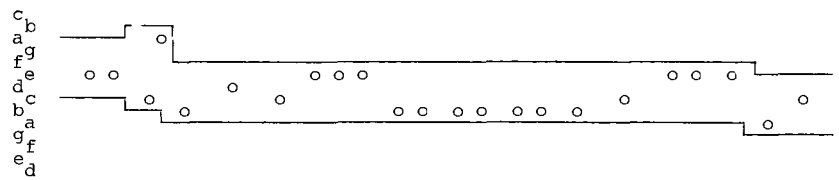
à mɔ fǎ ñ djé: bwɔ̀:gbèlêyî lá:ra ni# à pî:lè djo//
and you run cp enter bench-log under in and child-pl say
-emph -pl-the -the
P5, S15

Vol. medium-intensified same vol. moderate LLd
Sp. MFa MFa SSl
Int.

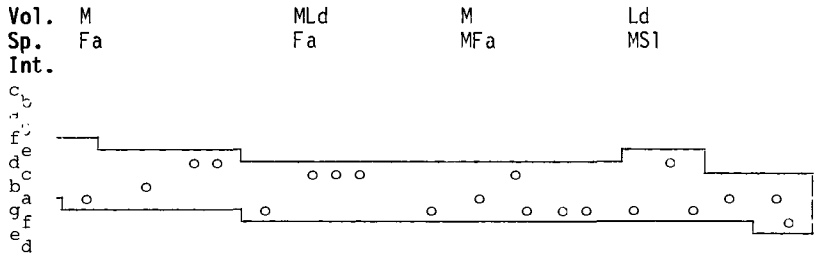


ye wi tjeri yaː// à be wî tjeri yaː/// à kàkèlèò pílá:ŵ ñ
you him cut there and they him cut there and Lizard zip and
(pl, hort)
S16

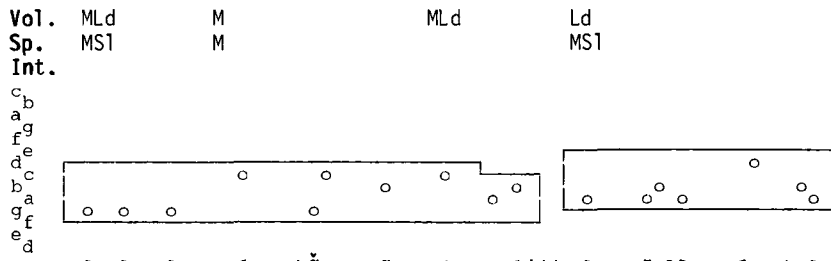
Vol. So MLd SSo
Sp. FFa FFa
Int.



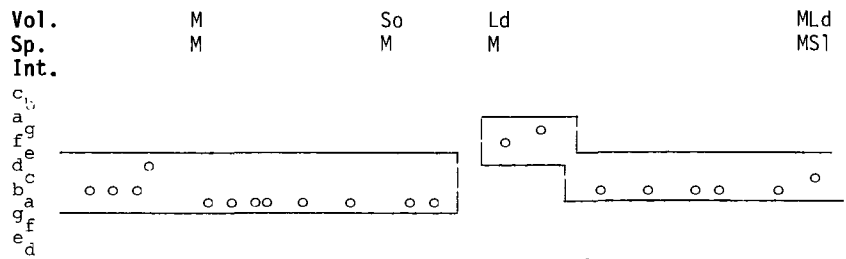
yiri pî:lè i wi kúrúgó kàrà kàrà kàrà/ à wi lúgú tí:gî ni//
come- child ct him after tap tap tap and he climb tree in
-out -pl-the -the



à be lúgú wì kúrúgó/// à wi sáː kòrò// ñdjógì ni yaː///
and they climb him after and he go- remain above in there
aux+pp -the

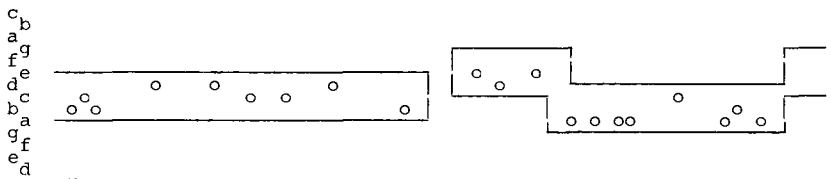


pǐːwàː à nǐ gbǎː nã wì na ǐ/// à pǐːlè gá baː
child fut again able arrive him on neg and child-pl emph come
-some -the -cp -cp
S17 **S18**



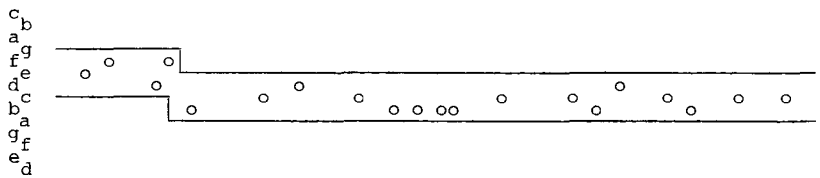
tjarigaː// kàkèlèò fã̀ ñ tìgì # wi sí fã̀ ñ tìgì lè wi
disperse Lizard run cp descend he but run cp descend rel his
-emph
P6, S19

Vol. M Ld MLd Ld
Sp. MFa Sl MSl Sl
Int.



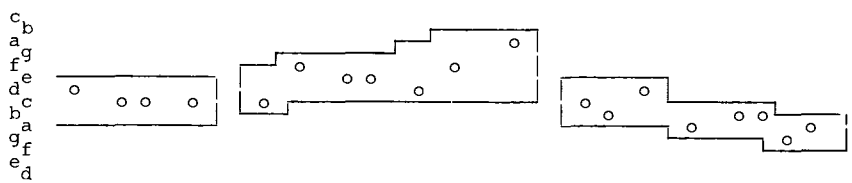
fǎgī té:-kwɔ́:lɔ́ li bé: lè:/// korō na kàkèlèō nī pī:lè //
king place-finish it there that that on Lizard then child-pl
dom-the **S20** -the

Vol. Ld MLd MLd
Sp. Sl M MFa MFa Fa
Int.



maʔá pī:lè nya: á be kàkèlèō nya:/ tjāʔǎ ō tjāʔǎ// a be
you- child-pl see and they Lizard see day to day and they
-emph -the -cj

Vol. M MLd M MLd M So
Sp. MFa MFa M MFa
Int.



wī nɛ̄nɛ̄ wi/// bī wī nɛ̄nɛ̄ bī wī kpó:///korō sī ñ yéré ābé:###
him chase it-is to him chase to him kill that but cp stop so
cj cj
S21 **S22**

'Lizard, Lizard, it was he whom they wanted to be the ruler. The ruler! They all said, "Oh, I can't rule the kingdom well. It has to be Lizard. Lizard, you are even wearing a red hat."

'But Rabbit came along and told him, "So, you say you are the one who is the ruler. Did the children agree to that?" Lizard replied that the children agreed with him. But the children said to him, "Since you said the children agreed, you'll be ashamed tomorrow." He answered that he wouldn't be ashamed. And they told him, "You will be ashamed tomorrow."

'The next morning, all the wild animals went to greet him, to greet the ruler, Lizard.

'One day, however, the children were passing by and saw Lizard sleeping on top of a bench. The children stopped and said, "Hey, look, Lizard is right there. It is a male lizard with a red hat," and the children cut him. "Oh, Lizard, you who are the ruler, you ran under the bench!"

'The children said, "Cut him there." And they cut him there. Then, zip, Lizard came out with the children after him, scritch, scritch, scritch, he climbed into the tree, and they climbed after him, and he stayed way up high there. No child could get where he was. When the children dispersed, Lizard ran down.

'But when he ran down, that was the end of his being ruler. That is why whenever a child sees a lizard he chases him. Chases him to kill him. That is the end of the story.'

2 THE PARAGRAPH

In the phonological hierarchy, the **paragraph** is the level immediately below the discourse and above the sentence. It consists of one sentence or a group of sentences bounded by paragraph juncture.

Each paragraph is characterized by paragraph stress on the initial component, by paragraph focal stress, by an overall intonation contour, and by external sentence juncture which separates its component sentences.

The phonological paragraph and the grammatical paragraph are coterminous. The phonological paragraph-initial margins may be identified by phonological and/or grammatical characteristics, whereas its final margins are identified only by phonological characteristics as will be described under Structure.

The paragraph is distinguished from discourse by paragraph initial stress (sect. 2.2.1), which is often less strong and covers less text than does the discourse stress. Paragraph juncture occurs medially in the discourse, but only externally to the paragraph.

The paragraph is distinguished from the sentence by the presence of paragraph juncture, by paragraph stress (which is stronger than sentence stress; sect. 3.2.1), and by the grammatical criteria of the initial margin (see below).

2.1 Structure of the Paragraph

The Paragraph may be simple or compound.

2.1.1 The simple paragraph consists of: initial margin, body, and final margin.

(1) The initial margin of the paragraph usually consists of only a part of the sentence in contrast to the initial margin of the discourse which may consist of an entire sentence or paragraph.

The phonological characteristic of the initial margin of the paragraph is paragraph stress (sect. 2.2.1), which is realized as high intonation, loudness, and slowness (see "The Lizard," paragraphs 2, 3, 4,

6). When any one of the characteristics is missing or reduced in degree, the stress is weakened. This occurs in paragraph types with initial relative clauses, particularly those beginning with the word **ãmɛ̀**: 'as' (see "The Wagon," paragraph 2).

The phonological characteristics of the initial margin may also be weak in the linking paragraphs that occur in discourse medial position since their intonation and speed are usually in the medial range with only a small interval between tones.

When the phonological criteria of the initial margin are weak, the grammatical criteria usually are present. Some of these are: preposed temporal or locative phrases or relative clauses and repetition of part of the preceding sentence. Also, the junctural pause preceding the paragraph may be longer than usual when the initial paragraph stress is weak.

On the other hand, when the grammatical criteria of paragraph initial margins are absent, the phonological criteria are strong. This occurs in serial sentences beginning with a conjunction **à** 'and' or **nî**: 'then'. These may occur sentence medially, sentence initially, or paragraph initially (see paragraph 2 in "The Lizard" and paragraph 4 in "The Wagon"). An example of **nî**: in these three positions is given on page 44.

Often, both strong phonological and grammatical criteria occur concomitantly in the initial paragraph margins. In "The Lizard," sentences 9 and 10 begin with temporal phrases and have strong paragraph stress. In "The Wagon," sentence 8 begins with a partial repetition of phrases of the preceding sentences, and also has strong paragraph stress.

(2) The body of the paragraph may consist of part of a sentence, a complete sentence, or several sentences.

Phonologically the speed of the paragraph body is normally faster, its volume softer, and the intonation lower than that of the initial margin except when paragraph focal stress occurs in the paragraph body (sect. 2.2.3). Initial margins of some paragraph types are lower and softer, however, than the initial part of the body. These are paragraphs whose initial sentences bear complex stress subtype 2 (page 72). An illustration of this is paragraph 2 in "The Wagon." There, the initial intonation begins low and is only a little higher than the end of the preceding paragraph, but it ascends in the paragraph body to the high point, which is the focal sentence (sentence 4).

The phonological realization of the body of the paragraph varies with the type of paragraph and the number of sentences. This will be treated under Paragraph intonation below.

(3) The final margin of the paragraph may consist of one word or phrase, or sometimes an entire sentence. Phonologically it is normally very low, very soft, and fast. Sometimes the final word or phrase is inaudible (see "The Wagon," end of paragraphs 1, 3, and 4).

The position of the paragraph in the discourse may modify the intonation and speed of the final margin. A medial paragraph preceding another medial paragraph may have a final linking sentence which ends

higher and slower than the preceding sentence. The prefinal sentence then carries the low intonation, but the final sentence has the soft volume of the final margin. In "The Wagon," the final sentence (sentence 7) of paragraph 2 links paragraphs 2 and 3. It carries medial intonation and ends medium fast. However, its volume is soft, showing that it is the final sentence of paragraph 2. The long sentence preceding it carries the focus of the paragraph and ends very low. The final margin must be low and soft unless a prefinal sentence ends very low.

In a long paragraph, the entire final sentence may comprise the paragraph margin. In "The Lizard" (paragraph 2, sentence 8), the final sentence is accelerated and soft, and has descending intonation.

2.1.2 The compound paragraph consists of the same types of initial and final margins as does the simple paragraph. However, within the body of the compound paragraph, a secondary stress occurs on the first phrase of the second component (sect. 2.2.2). This stress is much stronger and higher than sentence stress. Compare the stress of the final sentence of the first component with that of the second component in example 1 below.

There is no final margin on the first component of the compound paragraph, as can be seen in the example referred to above. The intonation and the volume remain medium preceding the second component.

The initial margin of the second component of the compound paragraph differs from the initial margin of the second component of a compound discourse:

* The intonation level of the low tones of the first phrase of the dependent discourse is either the same as or higher than that of the low tones of the final phrase of the preceding component.
* On the other hand, the intonation level of the low tones of the dependent paragraph is lower than that of the low tones of the final phrase of the preceding component. (See graph 6.)

2.2 Features of the Paragraph

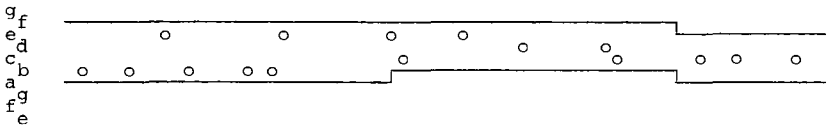
The features of the paragraph are demarcative, serving to make it a cohesive unit. These are described in the following order: initial and secondary paragraph stress, paragraph focal stress, intonation, sentence juncture, and paragraph medial juncture.

2.2.1 Paragraph initial stress is obligatory in every paragraph. It is manifested on the first phrase by higher intonation, louder volume, and slower speed than the stress on the preceding paragraph final margin. Even though it may be weak, it still is manifested.

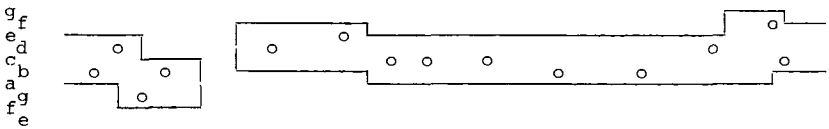
Paragraph initial stress is distinguished from the initial stress of a second component of a compound discourse by different realizations of stress. The initial stress of the second component of a compound discourse is realized as level intonation of low tones across discourse component boundaries and terraced intonation of high tones across component boundaries. The initial stress of the paragraph is always realized as terrace ascending intonation across paragraph juncture.

Paragraph initial stress is distinguished from sentence initial stress by its stronger realization on the paragraph than on the sentence. Comparison of sentences 6 and 7, which are medial in paragraph 2 of "The Lizard," with sentence 5, which carries paragraph stress, shows that the latter is loud and emphatic and has high intonation in contrast to the end of the preceding sentence. On the other hand, the contrast is not so great between intonation height, volume, and speed of the initial words of sentences 6 and 7 and the final words of the sentences immediately preceding them.

first component, **S3** (1)

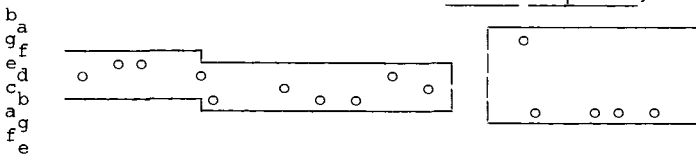


à pītjā:w̃ yīrī: // nī: wī pje ma: ra gi nyu:
and girl-the arise-emph then-cp him tell you-sg-fut ct it say-ct



gbɑ̃ʔɑ̃mɑ̃ ī /// mɔ gɑ́ ni gi nyu: nyà// wà: gɑ́ kɔ́:
hard neg you-sg emph ct it say-ct so anyone emph even-cp

second component, **S1**

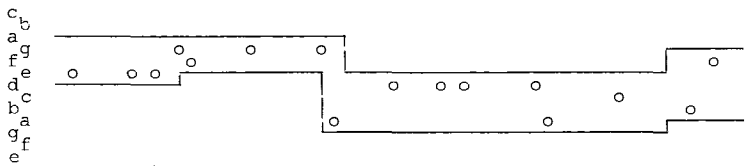


gī lɔ́ʔɔ́/ ka: pje fɛ̀:rɛ̀ kɛ̀:lɛ́ # nī: yīrī ñ
it hear it-fut be shame affair then-cp arise cp

'And the girl got up and told him, "You mustn't say it so loudly. If you say it like that and someone hears it, it will be a shameful thing."
'Then (she) got up and ....'

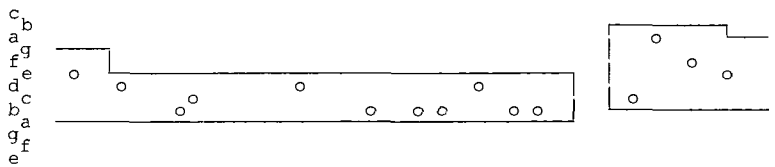
2.2.2 Secondary paragraph stress occurs in compound paragraphs on the initial phrase of the second component of the paragraph. This is realized as lower intonation of the low tones, but much higher intonation of the high tones in comparison to the low and high tones of the preceding component. In the above example taken from "The Ruler and His Son," a portion is given of the first component of the compound paragraph, followed by a portion of the second component. (Vertical lines in the intonation section signal the beginning and end of sentences.)

Vol. MLd M Ld (2)
Sp. S1 MFa MFa
Int.



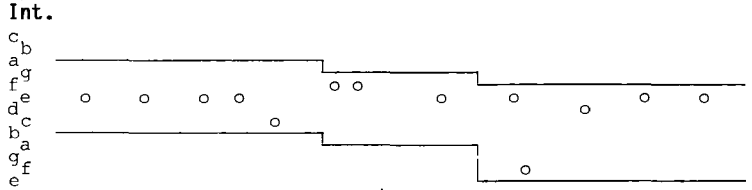
ā fǎʔǎfɔ́w̄ djá: kɔ̄ː wí yíbé/ nīː djo// nyāʔá
and ruler-the son even-cp him ask then-cp say what

Vol. MLd Ld Ld
Sp. MS1 MS1
Int.



na mɔ nă: kpmɔ̄: nyà lālā ó lālā/// nyàʔá na mɔ
on you mother hit so time to time what on you
(Par Focus)

Vol. M M
Sp. M M
Int.



da wi la:la ń wélé// ní náː wí lá: í
remp her test cp look then after her take neg
emph -cp

'And the ruler's son came to ask him saying, "Why do you hit mother like that all the time? Why didn't you test her, then after that take her?"'

2.2.3 Paragraph focal stress is another obligatory demarcative feature which occurs once in each paragraph. Because focal stress also occurs at the sentence level, it is described in section 3.2.2. On the paragraph level it differs from the sentence focal stress in its extent. While sentence focal stress may occur on one word or phrase of a sentence, the paragraph focal stress may affect an entire sentence or more than one sentence.

In the paragraph preceding the focal peak, the focal stress causes volume to become louder, intervals between tones to become wider, intonation to rise or remain at a relatively higher level, and the speed to be moderate. After the focal peak, the volume becomes softer, intonation drops, intervals between tones become narrower, and speed accelerates to the end of the paragraph. The buildup to the focal point and the focal peak may cover several sentences.

The focal stress peak may occur paragraph medially. In "The Lizard," sentence 16 is the focal peak of paragraph 5. Preceding the focal point, sentence 15 builds up volume and has medium fast speed. Then sentence 16 is higher, slower, and louder than the preceding sentence. Immediately after the focal point on the first clause of sentence 16, the intonation descends, the volume diminishes, and the speed accelerates to the end of the paragraph.

The focal stress peak may occur paragraph initially. In "The Lizard," the focal peak occurs on the first clause of the paragraph body: **pè myɛ̃ sḗgì yā̃wé:ré i syé:** 'all the field animals are going'. The margin of that sentence is the preceding conditional clause. Normally the next lower intonation level would begin on the first high tone following the conditional clause, but in this instance it does not because of the focal peak. The intonation remains level on the main clause due to the type of sentence, but the volume diminishes. Accelerated speed, softer volume, and descending intonation then continue to the end of the paragraph. (See paragraph 3.)

Focal stress may occur paragraph finally. In that event, the volume may diminish to medium at the end of the focal sentence, but not to soft. The final margin, however, may still be very low. Example 2 shows paragraph focal stress in the final sentence. Note that the first clause of the final sentence reaches the highest point in the paragraph. It is also loud. The wide intervals between tones continue through the second clause of the final sentence, even though the intonation goes very low and the volume diminishes to medium to signal the end of the sentence and paragraph.

2.2.4 Paragraph intonation is a demarcative feature of the paragraph, serving as a cohesive factor. Since intonation is a distinctive feature of the sentence, it is given in detail in sections 3.3.2 and 3.4.2.

Intonation at the simple paragraph level serves to mark the initial and final margins and focal stress of the paragraph. In most paragraphs, the initial paragraph margin is high, and the final margin is low. Most paragraphs, therefore, have an overall descending intonation contour.

Some paragraphs, however, have a final margin which is higher in intonation than the last part of the preceding prefinal sentence. This signals that something important follows, such as a discourse focal paragraph or a second or third discourse within a complex compound discourse. In "The Wagon," the final sentence of paragraph 2 is at a higher intonation level than the end of the preceding sentence. This signals the continuation of the story after the explanatory paragraph 2.

Semantic criteria determine to some extent the intonation contour of the body of the paragraph, but not to the extent that they do in the sentence. In some paragraphs, the body carries a relatively level intonation contour. By this is meant that the high points of the sentence intonation contours do not rise above a high medial range until the focal point, and the low points do not descend below a low medial range. Some of the paragraph types in which this occurs are: explanatory, statement and reply, command and response, and exhortative.

In other paragraphs, the body carries terrace intonation. This means that the high points of the sentence intonation contours rise to the high range, and the low points descend to the low range. Some of the paragraph types which bear terrace intonation are: adversative or argumentative, serial focal (in which the conjunction **nī**: occurs initially in the sentence), and exclamatory. An example of an adversative paragraph is paragraph 2 in "The Ruler and His Son." Often discourse introductory paragraphs also bear terrace intonation, an example of which is the introduction of the same discourse.

2.2.5 Sentence juncture is a demarcative feature which occurs between the sentences within the paragraph. It is realized as a definite pause preceded by a low sentence margin with soft volume and fast or medium fast speed, and followed by a higher sentence margin with louder volume and slower speed. The pause is usually slightly longer than sentence medial juncture. However, it may be about the same length as medial juncture between some components of complex sentences, or even between a front-shifted or rear-shifted phrase which is particularly set off from the main body of the sentence (page 66).

Sentence juncture pause is normally shorter than paragraph juncture pause. However, paragraph pause must always be followed by paragraph initial stress, whereas sentence pause is followed by sentence stress (sect. 3.2.1).

2.2.6 Paragraph medial juncture is a demarcative feature which separates the components of a compound paragraph. It is realized as a long or a short pause preceded by a sentence ending in medium intonation and volume, and followed by secondary paragraph stress.

3 THE SENTENCE

3.0 The Sentence Defined

In brief, the sentence is defined as the discourse level between the paragraph and the phonological group. It is realized as one or more phonological groups (chap. 4) and is bordered by sentence juncture. The sentence is characterized by the demarcative features of sentence initial, medial, and focal stress, and by the distinctive feature of intonation.

The phonological sentence correlates in many ways with the grammatical one. Phonological groups within sentences often correlate with grammatical clauses and phrases.

3.1 Sentence Structure Introduction

Sentences may be simple or complex. The complex sentence further divides into expanded and compound subtypes. These sentence types are described in detail in sections 3.3 and 3.4.

The basic sentence subtype is the simple sentence. The complex subtype consists of either a simple sentence with an expansion clause, or a combination of two or more simple or complex sentences, or of a combination of simple and expanded sentences. In order to see their interrelationships, the structure of sentence types is outlined briefly below.

The simple sentence is the basic unit which contains one sentence nucleus and is bounded by sentence juncture. It is comprised of from one to four rhythm groups and bears one simple intonation contour, one obligatory sentence stress, and one optional focal stress.

The complex sentence is a unit which contains more than one nucleus and is bounded by sentence juncture. It is comprised of two or more phonological groups which are separated by sentence internal juncture. It bears a complex intonation contour, primary and secondary sentence stress, and complex sentence stress. The complex sentence may be either expanded or compound.

The expanded sentence contains only one sentence focus.

The compound sentence contains a major focus and a minor focus and two or more sentence nuclei.

3.2 Shared Features

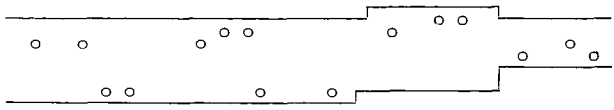
The distinctive feature of intonation is shared by both the simple and the complex types of sentence. However, because this feature is distinctive in some different ways in the two types, it will be described on both the simple and the complex sentence levels.

The demarcative feature of sentence medial juncture occurs in both simple and complex sentences, but as it is more prevalent in the latter, it is described in detail in the section dealing with complex sentences (page 66ff.). The demarcative features of sentence stress and focal stress are also shared by both the simple and the complex sentence types. For this reason they are described here before either type is given in detail.

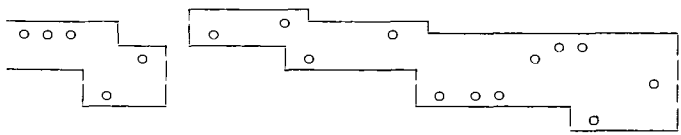
3.2.1 Sentence initial stress is a demarcative feature that marks the initial boundary of a sentence. Only one sentence stress occurs in each simple sentence. However, secondary sentence stress may occur in complex sentences (page 70). Every sentence must carry major sentence stress on its initial phonological group.

Sentence stress is realized as: increase in volume, decrease in speed, and high intonation level. This increase in volume (loudness), decrease in speed (slowness), and high intonation level may be equaled or surpassed at only one other point in the sentence--the place of major focal stress (see below). Sentence stress is illustrated in "The Lizard" where the volume, speed, and intonation levels are given above each line of the story.

(3)



djo worò à wodórõw tjõ sí lúgú// à worõ
say he fut wagon-the catch then mount and he



kóló?õ ñ to:/// à kõgi djé: ñ kòrò wodórõw ni
miss cp fall and hand-the enter cp stay wagon-the in
'... saying he would catch hold of the wagon and climb up, and he missed and fell. And his hand caught and turned around in the wagon wheel.'

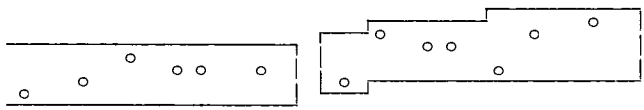
Sentence stress is sometimes the only way to distinguish between a sequence of two individual sentences and a compound sentence since the

same conjunctions may be initial in an independent sentence and in a dependent one. Example 3 shows the conjunction **à** 'and' sentence initially and sentence medially.

The first **à** 'and' is in a group at a lower intonation level than the preceding phonological group, showing that it does not carry sentence stress. The second **à** 'and' is on a higher intonation level than the preceding phonological group, showing that it does carry sentence stress, thus making it a new sentence.

The following example from "The Lizard" shows the conjunction **bĭ** in sentence initial and sentence medial position. It occurs more often in medial position than in initial.

Vol. M MLd M MLd (4)
Sp. MFa M
Int.



à be wĭ nɛ̃nɛ̃ wi /// bĭ wĭ nɛ̃nɛ̃ bĭ wĭ kpɔ́:///
and they him chase it-is to him chase to him kill
'and what it is, is they chase him. Chase him in order to kill him.'

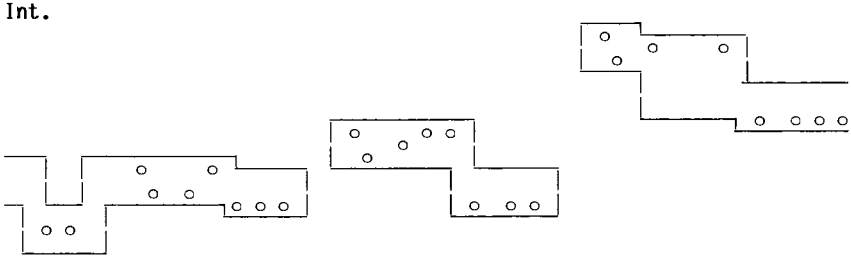
The sentence beginning with **bĭ** is a new sentence because it begins at a higher intonation level and is slower and louder than the preceding sentence. However, unlike most sentences, the initial stressed phonological group of this sentence is lower than the rest of the sentence. This is due to rising terrace intonation which occurs when the focus is in sentence final position. In this case, the focus is on **kpɔ̄:** 'kill'. The second **bĭ** is medial; it does not begin a new sentence because it is on the same intonation level and is not as loud nor as slow as the preceding word. Therefore it does not meet any of the above requirements for sentence stress.

Serial sentences whose subjects are the same do not repeat the subject. They employ a conjunction such as **nî:** 'then' as the initial word in each new dependent clause in serial compound sentences, in new independent sentences, and in new paragraphs. The only way to know whether the new clause conjunction **nî:** 'then' is the initial word of a new clause of a dependent sentence, of an independent sentence, or of a new paragraph is by the high intonation, loud volume, and slower speed which are the characteristics of sentence stress and paragraph stress. In example 5 from "The Ruler and His Son," the conjunction **nî:** 'then' occurs initially in a clause, in a sentence, and in a paragraph.

In the clause, sentence initial stress does not occur on **nî:** because of its soft volume and fast speed, and its intonation which is not as high as the beginning intonation of the preceding clause. On the other hand, the independent sentence has all the characteristics of sentence initial stress. The paragraph has much stronger characteristics of stress, showing that this is paragraph initial stress.

Dependent Clause Independent Sentence New Paragraph (5)

Vol.	MSo	M	So	Ld	MLd	VLd	MLd
Sp.	Fa	Fa	FFa	Sl	FFa	Sl	M
Int.							



pɔ̀lì// nî: wìyê: bɔ̀lì///nî: yasînégî pɔ̀lì # nî: wî kpmɔ̃́: ñ yìrìgè
smear then him- smear then bed-the smear then her hit cp raise
-cp self -cp -cp -up

'... smeared, then smeared himself. Then (he) smeared the bed. Then (he) hit her and woke (her)....'

Sentences with an initial subject or a temporal adverb, on the other hand, may seem to be independent, but actually they are not because they do not bear sentence initial stress. They do bear secondary stress (page 70), which is weaker. This is illustrated in sentence 8 in "The Lizard".

Sentence initial stress must have at least one of the three characteristics listed above. The obligatory characteristic is higher intonation sentence initially than the preceding clause. However, this does not always mean higher intonation than the remainder of the sentence. This was illustrated in example 5. In sentence 8 of "The Lizard," intonation characteristics of loudness and slowness have been eliminated in paragraph final position following paragraph focus. In that position the sentence is accelerated and has diminished volume.

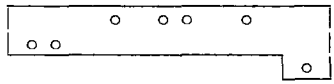
3.2.2 Sentence focal stress is an optative demarcative feature. Most sentences carry it, but some which function as links in a paragraph do not.

Sentence focal stress is realized as a wide interval between tone levels (with extra high or extra low tone on the focal word or words), loudness, and deceleration of speed (emphasis). Often sentence focal stress is realized as high intonation which may be higher than the intonation of sentence stress. However, sentence stress intonation is usually higher than focal stress intonation.

Sentence focal stress may be realized also as extra low intonation. This is illustrated in example 6 in which the emphasis is on the last two words.

Sentence focal stress occurs on a word or on a phrase within a sentence in initial, medial, or final position. When it occurs initially, it is concomitant with sentence stress. This causes extra high intonation on the initial word. Initial focal stress often occurs in

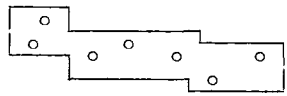
(6)



yèlē gá ŋúnɔ́ ná: ì///
you-pl emph sleep here neg-q
'You've slept here, haven't you?'

interrogative sentences having a preposed interrogative adverb or pronoun. In example 7, the emphasis is on the first word.

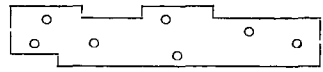
Vol. Ld M MSo (7)
Sp. Sl accelerate....
Int.



mɛ̌: wi gí pje ñ sɛ́:
how-q he it do cp be-so
'How does he do it that way?'

Sentence focal stress may occur medially in the sentence:

Vol. MLd Ld decrease (8)
Sp. M Sl accelerate
Int.



mɛ̌: be gâ: gí pye
how they emph-fut it do
'How would they do it?'

The focal stress in the above example is characterized by higher intonation, since the second phonological group of the sentence would normally have lower intonation than has the first phonological group which carries sentence stress. The first word of the second phonological group is **be** 'they'. It is at a lower intonation level than the preceding word, as the mid tone of **be** is on the same level as the beginning low part of the rising tone of **mɛ̌:**. But intonation on the focal word **gâ:** returns to the level of the preceding phonological group.

Sentence focal stress in final position may cause terrace intonation to rise rather than descend (see example 4). This example carries rising intonation both because of final sentence stress and because the sentence bears paragraph stress. As an explanatory sentence also, it is stressed and carries higher intonation, even though it is final in the paragraph. However, intonation may descend when paragraph stress precedes a sentence having final stress (see example 3). Descending intonation also occurs when the sentence with final stress carries strong descending intonation due to the sentence type, as in an interrogative

sentence beginning with an interrogative adverb (see the final part of example 2).

3.3 The Simple Sentence

The simple sentence is the level above the rhythm group and below the complex sentence. It consists of one or more phonological groups which bear one simple intonation contour, one initial sentence stress, and one optional sentence focal stress. It is bounded by sentence juncture.

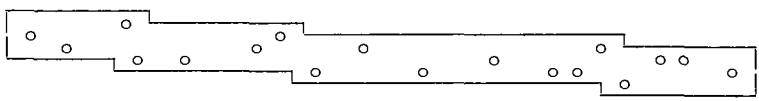
3.3.1 The structure of the simple sentence consists of an obligatory nucleus and an optional prenuclear margin and/or an optional postnuclear margin.

(1) The nucleus is characterized by:

* higher intonation, which is generally relatively higher than the postnuclear margin,
* louder volume, which is relatively louder than the postnuclear margin, and
* slower speed, which is relatively slower and more emphatic than the speed of the postnuclear margin.

with terrace intonation (as seen in "Speak with Your Child")

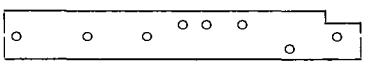
Vol. M MLd Ld SSo (9)
Sp. moderate moderate moderate FFa
Int.



wi ñ sâ: mĩ: pɔ̃-bí:lĩ lá: ñ le bàrĩkɔ̃gĩ lɔ̃ʔɔ̃ ni
he -cp go-cp my dog-little take cp put-in barrel water in
-the -the
INNER MARGIN / NUCLEUS / MARGIN
'He went and got my little dog and put him in the barrel of water!'

with level intonation (as in conversation)

Vol. LLd SSo (10)
Sp. moderate accelerate
Int.



ta mã: wo kárí ní mĩ: ní
fut come we go then me with
NUCLEUS / MARGIN
'Come, let us go.'

Although the intonation of example 10 is level, the sentence ends with slight downward intonation on the final word of the postnuclear margin.

(2) The postnuclear margin is characterized by

* acceleration
* decreased volume
* lower intonation, and
* sometimes less distinctly enunciated consonants and vowels.

In some cases, the final **i** is not heard distinctly in the sentence margin; in others, the general class pronoun is contracted and assimilated to the verb in the preceding nucleus.

zãgó: yèlè mjɛ́ í ra nyɛ́:rí mì: ké:l̀ na (11)
so-that you all des ct pray-ct my affair on
-emph -pl the
'so you all can pray for me'

wi ñ gí kã:ɔ̃ má. **[wi mì gí kã: wì má]** (11a)
he cp it give-him to
'He gave it to him.'

In example 11, the **ì** in **kē:lì** is elided since the word is pronounced at accelerated speed in the margin, and **i** is between homorganic consonants. In example 11a, the pronoun **wì** in the margin phrase **wì má** is contracted with the preceding verb **kã:**.

The postnuclear margin, however, has none of these characteristics if it carries sentence focal stress. When it carries focal stress, the postnuclear margin words are raised in intonation, are louder, and are more clearly and slowly enunciated.

focus on **nã ya:** focus not on **ya:** but on **lé** (12-13)

pe ñ nã ya: **a be nã:lé**
they cp arrive there and they arrive there

emphatic higher
louder louder
slower

They have arrived there.' 'Have they arrived there?'

In example 13, **nã:** is the contraction of **nã ya:** 'arrive there' because it is not stressed, but **lé** (question) is stressed. In example 12, **nã ya:** is stressed and is not contracted.

(3) The prenuclear margin carries sentence initial stress because it always occurs on the first word of the sentence. Therefore, the prenuclear margin of the simple sentence is always either higher and louder than the nucleus or it is equally as high and as loud as the nucleus.

The prenuclear margins and the nuclei may be identified by meaning and/or by phonological criteria.

In addition to sentence stress, often the focus also occurs on the prenuclear margin. When focal stress occurs on the prenuclear margin, it is higher and louder than the rest of the sentence.

In serial sentences which begin with the conjunction **nî:** or **sî**, the prenuclear margin conjunction is higher and louder than the rest of the sentence, as seen in example 14 from "The Ruler and His Son":

(14)

nî: yasînégî pɔ̃lî
then-cp bed-the smear
MARGIN / NUCLEUS
'then (he) smeared the bed'

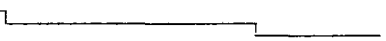
Also, the raising of the intonation above the beginning of a preceding serial sentence is an important factor in distinguishing a new serial sentence from the serial clause in a compound sentence (example 5).

A prenuclear margin which is a separate rhythm group is higher than the remainder of the sentence. This occurs when:

* the person is addressed by name:

(15)

Vol. MLd decreased
Sp. Sl accelerated, emphatic on verb
Int.

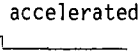


kākēlēð: // mɔ sî î ñdɔ̃nyɛ̃̌:gî tɔ̃gî
lizard you-sg but ct hat-red-the cover-ct
MARGIN / NUCLEUS
'But Lizard, you are wearing a new hat.'

* a question word is first in the sentence:

(16)

Vol. Ld MLd
Sp. Sl accelerated, emphatic on verb
Int.

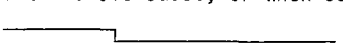


sɑ̃̄ / wi yîrî
where he get-up
MARGIN / NUCLEUS
'Where did he come from?'

In both of the preceding examples, the prenuclear margins are higher, slower, and louder than the nuclei. These three features together indicate sentence focal stress.

The prenuclear margin is level with the beginning of the nucleus when it is neither of the above cases, or when sentence focus does not occur.

(17)

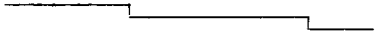


à pî:bêlê wî tjeri
and children-the him cut
MARGIN / NUCLEUS
'And the children cut him.'

In all the examples, the nuclear components are clearly enunciated. Only the margin may be unemphatic and slurred over, and this only when sentence focus does not occur on the margin.

The simple sentence may have both a prenuclear and a postnuclear margin.

Vol. Ld MLd So (18)
Sp. Sl accelerate
Int.

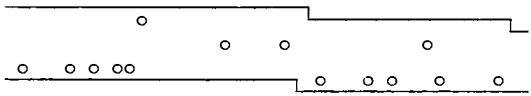


a sjɛ̃̀:mî nã lé wí na
and crowd-the arrive q him on
MARGIN / NUCLEUS / MARGIN
(prenuclear) (postnuclear)
'Did the crowd reach him?'

(The focal word is underlined in the free translation of the above example.)

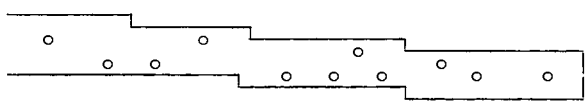
(4) The simple sentence may have an expanded margin in either prenuclear or postnuclear position.

Vol. Ld, emphatic M (19)
Sp. Sl accelerate
Int.



à kàkèlèɔ̃:// mɔ wi lè fɑ̃ʔɑ̃-fɔ̃w̃// à
and lizard you-sg he rel ruler-the and

Vol. M So So
Sp. accelerate accelerated
Int.



mɔ fɑ̃ ñ djɛ́:// bwɔ̃:gbèléyî lá:rá ni
you-sg run cp enter bench-slats underneath in
the
'And Lizard, you who (are) ruler, you ran under the log bench.'

Example 19 has an expanded prenuclear margin which is an expansion of the subject. The margin consists of two parts: the name and the relative clause. The margin bears the focal stress of the sentence. The nucleus is a compound clause which has accelerated speed and diminished volume. The postnuclear margin is very soft.

3.3.2 Features of the simple sentence are demarcative and distinctive.

(1) Sentence initial stress is a demarcative feature that is shared by both the simple and the complex sentence. This feature was described in section 3.2.1.

(2) Sentence focal stress is another demarcative feature of the

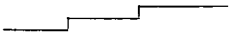
simple sentence shared with the complex sentence. This was described in section 3.2.2.

(3) Sentence intonation is a distinctive feature on the sentence level because the type of intonation signifies movement or stationary position in time, place, and events. It is the raising or lowering of tones of words or of groups of words, thus forming intonation units which stand in relationship to each other and form the intonation contour of the sentence. Two types of intonation contours occur: terrace and level.

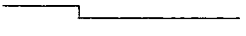
Each simple sentence bears one intonation contour. This contour may be modified by sentence focus, somewhat by its position in the paragraph, and even by the position of the paragraph in the discourse, but not to the extent that the type of intonation is changed. At the end of the paragraph, for example, sentence terrace intonation may descend more rapidly than it does in the middle of the paragraph. In mid paragraph, terrace intonation may ascend rather than descend because it is building up toward sentence focus. Or in discourse, a discourse medial paragraph ends with a sentence of level or very slowly descending terrace intonation to signify that another paragraph follows.

(a) Terrace intonation contour refers to the relative intonation level of components of the sentence, each of which may be at a lower or a higher intonation level than the preceding one. In a simple sentence, the terracing goes only one way: either descending or ascending. Descending occurs more frequently than ascending intonation. Ascending terrace intonation may be caused by sentence focal stress in final position on a word bearing high tone. In the following seven illustrative sentences, focal stress is indicated by underlining.

ascending terrace intonation



descending terrace intonation (20.1,2)



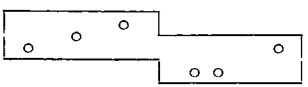
S1. **wi i nyà?á kpé?élé**
he ct what do-ct
'What is he doing?'

S2. **nyà?á wi kpé?élé**
what he (ct)do-ct
'What is he doing?'

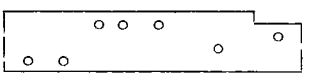
Ascending intonation may occur in a sentence preceding paragraph focus, as noted above.

Terrace intonation is not the descent on the final word of the sentence, which occurs in sentences of both level and terrace intonation contour. This descent is part of the realization of sentence juncture,

sentence with terrace intonation



sentence with level intonation (20.3,4)



S3. **mì: i sjé: kà?à má**
I ct go-ct village to
'I am going home.'

S4. **wò ñ kárí ní wi ní**
we cp go then him with
'We went with him.'

which is preceded by lower intonation and followed by higher intonation. In sentences bearing the terrace intonation contour, the entire final phonological group is lower than the preceding one, and not just the final word or syllable. Each phonological group nucleus is on a separate intonation level.

In sentence 3, the nucleus of the postpositional phrase **kà?à** is realized on a lower intonation level than the nucleus of the preceding phrase. However, in sentence 4, the nucleus **wi** of the postpositional phrase is on the same level as the nucleus of the preceding phrase. Only the margin **nî** of the postpositional phrase in sentence 4 is lower. This lower intonation, then, is due to sentence juncture and not to a terrace intonation contour.

Terrace intonation levels change generally when there is a change of tone on the word. For example:

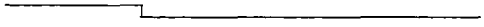
terrace change — no change until after post-positional phrase nucleus (20.5,6)

S5. **wi ǹ kárí kà?à má**
he cp go village to
'He went home.'

S6. **wi ǹ kárí tjénégí má**
she cp go market-the to
'She went to the market.'

However, when major sentence medial juncture occurs and a new rhythm group begins, the terrace intonation level may change between words bearing the same tone.

(20.7)



S7. **wi ǹ yírí // pí:lé i wí kúrúgó ...**
he cp get-up children-the ct him after ...
'He left with the children after him,...'

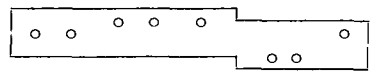
Simple sentences bearing terrace intonation contour usually have from two to four intonation units. These correlate with the phonological groups, which may be rhythm groups or breath groups (chap. 4).

In simple sentences, the terrace intonation contour is carried both on high tones (indicated by the top line of the contour diagram) and on low tones (indicated by the bottom line).

Meaning is related to the occurrence of terrace intonation. Terrace intonation occurs in sentences that include changes of place, events, or time. It also occurs in sentences that show contrast in degree, as in sentences modified by the adverbs "too much" and "too little." It does not occur in sentences that speak of movement within a set block of time, as the far past or the present, or when the adverbs "every day," "every week," etc. modify the sentence. It does not include states of being, as in "he is sitting there." Neither does it include the idea of accompaniment, as in "he talks with him," "we went with him."

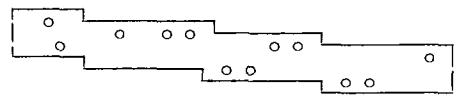
The sentences in example 21 were selected to illustrate the types of situations in which **terrace intonation** occurs.

when the location of the event is specified: (21.1-7)



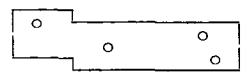
S1. **wi i bā:rá ná:/ yèlè má**
he ct work-ct here you-pl to
'He works here at your place.'

if the event happens as a series of events within the narrative:



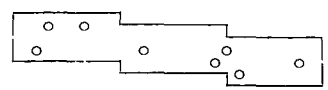
S2. **ní: sí kárí lɔ̃ʔɔ̃tɔ́rɔ́ kàʔà má**
then-cp but go hospital village to
'But then she went to the hospital.'

in interrogative elliptical sentences:



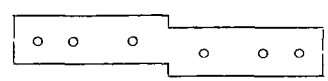
S3. **á mɔ tjɛ́w̃**
and your-sg wife-the
'and your wife?'

in interrogative sentences containing interrogative adverbs, nouns, or pronouns:

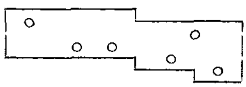


S4. **wĩ́ má/ pe sɔ̃:w̃ kã:**
who to they deer-the give
'To whom did they give the deer?'

when the degree of action is specified, implying contrast:



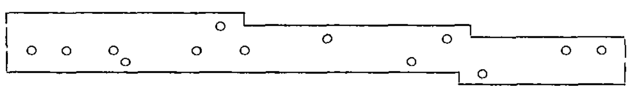
S5 **wi i nyũ: ni tjã:ri**
he ct talk-ct exceed-ct
'He talks too much.'



S6. **pe ǹ fã̀ gbã̄ʔã́mã̄**
they cp run hard
'They ran hard.'

A sentence nucleus may bear level intonation while the postnuclear margin bears terrace intonation, making the sentence a terraced sentence. In the following example, level intonation carries through the stative clause and through the nucleus of the manner postpositional phrase, but terrace intonation begins on the final locative phrase:

Sentence: Nucleus — Inner Margin — Outer Margin
Words: — nucleus margin — nucleus margin

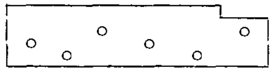


S7. **wi i yaː̀ wodɛ̃́ː ɔ̃ ní/ lòkpɔ́ːgì tã́ːnã́**
he ct there one-sit-suf with water-large-the near
'He is sitting there, by the sea.'

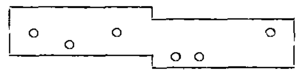
It is to be noted that each successive terrace level begins on the margin following the final grammatical nucleus of the preceding unit. Therefore, level intonation carries **across** the grammatical nucleus and descends on the margin. In sentence 7 above, the intonation carries across the nucleus **wodɛ̃́ː** and descends on the margin which is the suffix **ɔ̃**. The next level carries across the noun suffix and margin of the postpositional phrase and through the nucleus of the following postpositional phrase. Another terrace level occurs beginning on the class-definite suffix of the noun nucleus and carries across the border between the nucleus and margin of the postpositional phrase.

(b) Level intonation contour is the occurrence of tones of sentence components on the same relative level. All high tones are the same relative height, all low tones are the same level, etc. There are no intonation units at separate levels in sentences bearing the level contour, as the following eight illustrative sentences show.

level intonation — terrace intonation (22.1,2)



S1. **wi ǹ gí djoː wì má**
he cp it tell him to
'He told him.'



S2. **wi ǹ pã kàʔà má**
he cp come village to
'He came home.'

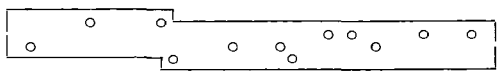
Level intonation contour contrasts with terrace intonation contour which is realized as successive intonation levels.

As was noted above, the downward intonation on the final syllable only is not a terrace intonation contour, but it is part of the phenomenon of sentence juncture.

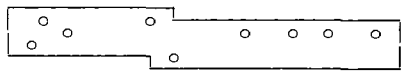
The contrast between sentences 1 and 2 of the above example is in the relative heights to each other of the nuclei of the nuclear phrases and of the nuclei of the margin phrases. In sentence 1, **djo** 'told' (the nucleus of the nuclear phrase) and **wĩ** 'him' (the nucleus of the margin phrase) are on the same intonation level. This can be seen by comparing the low tones of **ñ** 'has' in the nuclear phrase and of **wĩ** 'him' in the margin phrase. They are on the same intonation level. On the other hand, in sentence 2 the nucleus **pã** 'come' in the sentence nuclear phrase and the nucleus **kã?à** 'village' in the sentence margin phrase are on different intonation levels. This can be seen by comparing the relative heights of the low tones of **ñ** 'has' and **kã?à** 'village' in the two intonation units: **kã?à** is lower than **ñ.**

Furthermore, it should be noted that a sentence bearing a level intonation contour can have higher intonation initially or lower intonation finally due to initial or final focal stress. The following sentences carry level intonation contours, even though the intonation changes initially or finally. Sentences 3 to 6 bear initial focal stress, and sentences 7 and 8 bear final focal stress. The final focal stress is low in sentence 8 because it is a response to a question (page 71), and because the stressed word has low tone. Sentence 8 carries focal stress on the final adverb and negative particle.

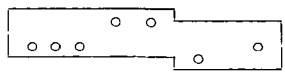
(22.3-8)



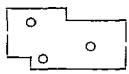
S3. **mĩ: gã wɔ̃ː wi tɛ̃ː-kãrĩga tjã̃ ĩ**
I emph also-cp his place-go know neg
'I don't know where he has gone either."



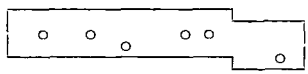
S4. **ɛ̃ː?e/ sẽgĩ gã lɛ̃ːlĩ ĩ**
no field-the emph be-far neg
'No, the field isn't far.



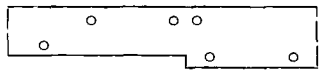
S5. **tɔ̃rɔ̃gɔ̃ yɛ̃ wɔ̃: mĩ: nyɛ**
Torogoite one I be-ct
'I am a Torogoite.'



S6 **pɔ̃ɔ̃ wi:**
dog it-is
'It is a dog.'



S7. **pe i mĩ: yiri Zyè**
they ct me call-ct Zie
'My name is Zie.'



S8. **yè gã ŋũnâ: ĩ**
you emph sleep-there neg-q
'You've slept there, haven't you?'

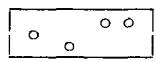
Meaning is related to the occurrence of level intonation. Level intonation occurs in sentences in which the time change is not noted, when the action occurs in a set time span, when a stative verb occurs (such as "sit"), or when a stative adverbial phrase occurs (as "with sitting"), or when the action occurs in the same location as in contiguous sentences of the paragraph.

Level intonation does not occur in sentences which show contrast in time, place, degree of action, or in questions and answers.

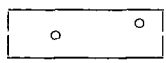
The following fifteen sentences were selected to illustrate the types of situations in which **level intonation occurs.**

Level intonation occurs: (23.1-15)

* in sentences having no margin phrase to show change of place or time:

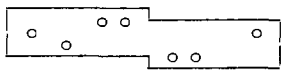


S1. **wi ñ kãrĩ**
he cp go
'He left.'

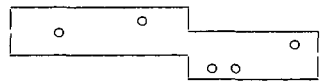


S2. **ma: sjé:**
you-sg- go-ct
hort-ct
'Go.'

(but if there is a locative postpositional phrase in the final position, the sentence is terraced):

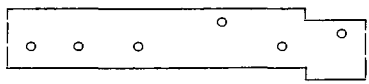


S3. **wi ñ kárí kà?à má**
he cp go village to
'He went home.'

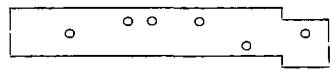


S4. **ma: sjé: kà?à má**
you-sg- go-ct village to
hort-ct
'Go home.'

* sentence margins that are postpositional phrases indicating accompaniment:

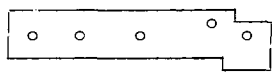


S5. **wi i nyũ: nî be nî**
she ct talk-ct then them with
'She is talking with them.'

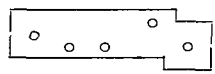


S6. **wo kárí nî mì: nî**
we-hort go then me with
'Come, go with me.

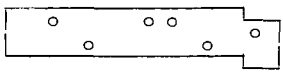
* in sentences whose margins have the meaning "for," "on," "about," or which have an indirect object:



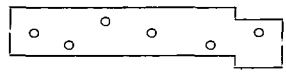
S7 **wi i nyũ: gî na**
she ct talk-ct it on
'She is talking about it.



S8 **wi ñ lì: gî na**
he cp eat it of
'He ate of it.'

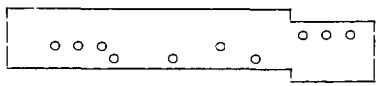


S9 **kpã:gì múgú mì: má**
house-the open me to
'Open the door for me.'

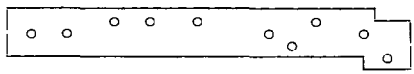


S10 **wi ñ gî djo: bẽ má**
he cp it tell them to
'He told them about it."

* in sentences which occur in a certain time span:

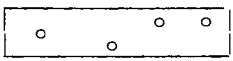


S11 **nîkã?ãɔ̃ ñ pje mì: kúrúgó**
evil-spirit cp be me after
'An evil spirit was after me.'



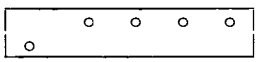
S12 **wi i bã:rá ná: tjã?ã̃ ó tjã?ã**
he ct work-ct here day to day
'He works here every day.'

* in questions with the interrogative particle **lɛ́**:



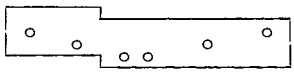
S13 **mɔ à tɛ̃́: lɛ́**
you-sg fut sit q
'Won't you sit down?'

* in negative statements:



S14 **mĩ: gã́ gĩ tjã̀ ĩ**
I emph it know neg
'I don't know.'

Questions with the interrogative particle **lɛ́** present an exception to level intonation. Sentence 13 which does not have focal stress contrasts with sentence 15 which does:



S15 **mɔ à lɔ̃ʔɔ̃ gba: lɛ́**
you fut water drink q
Would you like a drink of water?'

The meaning of sentence 15 is a question of desire to drink. Normally it is assumed the person who just arrived will take a drink of water, but if it is chilly the question may be asked. In sentence 13, on the other hand, the question is simply an invitation to the person to sit down. Similarly in sentence 14 the negative statement, which has no focal stress, contrasts with the negative statements in sentences 3 and 4 in the preceding section which have initial focal stress.

3.4 The Complex Sentence

The complex sentence is the level above the simple sentence and below the paragraph. It consists of two or more rhythm groups (sect. 4.2) which are separated by major sentence medial juncture (page 66). The complex sentence bears a complex intonation contour and is bordered by sentence juncture. It is further characterized by sentence stress on the initial word, by primary and secondary focal stress, and by complex sentence stress.

The complex sentence is realized as two subtypes: the **expanded sentence,** consisting of one simple sentence preceded by or followed by one or more rhythm groups, and the **compound sentence,** consisting of two or more simple or expanded sentences or a combination of both.

The complex sentence is distinguished from the simple sentence by the complex intonation contour and sentence medial juncture which characterize it. The simple sentence has a simple intonation contour, and rarely has sentence medial juncture.

The complex sentence is distinguished from the paragraph by having sentence initial stress which is not as strong as paragraph initial stress. It also has medial juncture between its components, whereas paragraph components are separated by sentence juncture.

3.4.1 Structure of the complex sentence. Each component of the complex sentence has an obligatory nucleus plus optional prenuclear and/or postnuclear margins. The nuclei and margins are characterized by intonation, volume, and speed, as described under the simple sentence.

The contrast between these characteristics in the nuclei and margins is often less marked here than it is in the simple sentence, due to the overlay of complex sentence stress, which is likewise characterized by volume, intonation, and speed (page 71).

Compound sentence: (24)

	Expanded sentence			Expanded sentence (Compound)	
Vol.	Ld	Ld	M	So	VSo
Sp.	M	MFa	MFa	Fa	VFa
Int.	Hi			MLo	

ŋgá kɛ́:llɛ̀: ta: nâ: lɛ̀/ tárì na// mì:ɔ̃̀ lí tórígó ya:/ wì má// wi
I- affair -that get here rel earth -the on I-cp it send there him to he emph

Vol.	MLd	MSo	So	VSo	
Sp.	M	MFa	Fa		
Int.	MLo	MLo	Lo	VLo	

sí gá kɛ́:llɛ̀: ta: ya: / ñdjógì ni// wa: lí tórígó ná:/ mì: má///
but emph affair get there above -the in he- fut it send here me to

'When something happened here on earth, I sent it there to him, but if something happened there above, he would send it here to me.'

The structure of the above example is shown in chart 1. Included are the features of volume, speed, and intonation which characterize the respective components.

Note that in the larger components of the compound sentence, the second expanded sentence is in general softer in volume and lower in intonation than the first expanded sentence. This is due to the type of complex sentence stress on the compound nucleus of the compound sentence (page 71).

Moreover, the components of each expanded sentence bear the type of complex sentence stress in which the introducer clauses are louder, slower, and higher than the main clauses. It is to be noted that in the expanded sentences, even the margins of the introducer clauses are louder, slower, and higher than the nuclei of the main clauses.

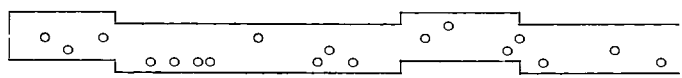
Chart 1.
The Compound Sentence

Expanded Sentence + Expanded Sentence (Compound)							
Introductory Clause + Main Clause				Introductory Clause + Main Clause			
Nucleus+Margin		Nucleus+Margin		Nucleus+Margin		Nucleus+Margin	
Vol.	Ld	M	So	SSo	MLd	So	SSo	Softest
Sp.	M	MFa	Fa	FFa	M	MFa	Fa	Fa
Int.	Hi		MLo		Lo		LLo	Lowest

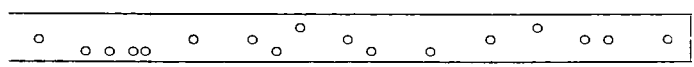
On the other hand, due to secondary sentence stress, the volume and speed of the nucleus of the second component of the compound sentence are louder and slower (page 70) than those of the final margin of the first component. However, the intonation of the second component is lower than the intonation of the final margin of the preceding component of the compound sentence.

3.4.2 Features of the complex sentence are characterized by: (1) complex intonation contour, (2) sentence medial juncture, (3) secondary sentence stress, (4) complex sentence stress, and (5) sentence focal stress.

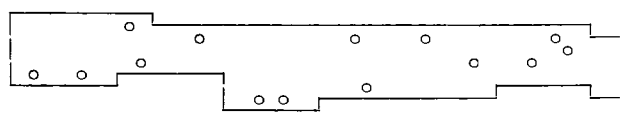
(25.1-2)



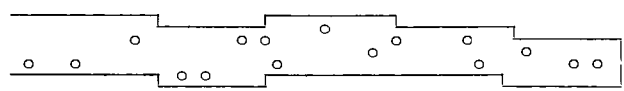
S1. **korõ na/ kàkẽlẽõ nĩ pĩ:lẽ// ma?ã́ pĩ:lẽ nya: ã**
that on Lizard with child-pl you-sg child-pl see and
-the -emph -the



be kàkẽlẽõ nya: tjã?ã̃ ó tjã?ã̃// ã be wĩ nɛ̃nɛ̃ wi
they Lizard see day to day and they him chase it-is
'Therefore, Lizard and the children, if you notice the children when they see a lizard every day, what they do is chase him.'



S2. **à pĩtjáw̃ gá yĩrĩ / nĩ: gĩ nya:// àyõ:://**
and girl-the emph get-up then-cp it see oh



mĩ: õ tja: nĩgɔ̃tjárĩw̃ ná: na ĩ // nĩ: wĩ ya?a
I neg want fellow-the here of neg then him leave
-ct -ct -cp
'And when the girl **awoke** and saw it, "Oh, I don't want anything to do with this fellow," and (she) left him.'

(1) Intonation is a distinctive feature in the complex sentence. The multiple contours within a complex intonation contour are never more than the number of bound constituents in the sentence.

The three illustrative sentences of example 25 show contrast in meaning between sentences with level intonation and those with terrace intonation. In sentence 1, the expanded complex sentence carries level intonation because it refers to daily activity: "when they see a lizard every day." Normally a sentence containing a conditional introducer clause carries terrace intonation because the sentence usually depicts a change in status or time; but in sentence 1 the same activity continues all the time.

In the second illustrative sentence, however, the expanded complex sentence (also containing a conditional introducer clause) bears terrace intonation because it shows progression of successive actions. These do not occur within a specific time as does the action in sentence 1.

Sentence 2 is a compound sentence whose initial component is an expanded sentence. The first clause is a compound introductory clause which is united by the cohesive feature of level intonation of the high tones (represented by the high circles and the top line). The high intonation on "and the girl" is due to sentence stress, after which the level intonation carries across the conditional-temporal clause that includes the indirect statement clause "then sees it" and the exclamation "oh!" The compound introductory clause is followed by the main clause which begins on a lower intonation level. This clause bears terrace intonation, but it and the final clause, "I don't want anything to do with this fellow" and "then left him," are united by level intonation because the final clause is a serial component of the compound sentence. The entire sentence bears terrace intonation, but of its components, the temporal-conditional clause bears level intonation, whereas the main clause and the final serial clause bear terrace intonation.

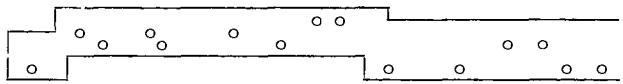
In sentence 2, the intonation of its components is carried on the top line, as described above, and that of the phonological groups (chap. 4) on the bottom line. In the literal translation of this sentence, the phonological groups are underlined separately.

It is interesting to note in the same sentence that primary focal stress occurs on **yìrì** 'get up', and secondary focal stress occurs on **nā: na** 'of this' in the main clause. In the free translation the primary focal stress is in boldface and the secondary underlined. The primary stress on the low tones of **yìrì** is marked on the bottom line of the graph, while the secondary stress on the high tone of **nā:** is marked on the top intonation line of the graph.

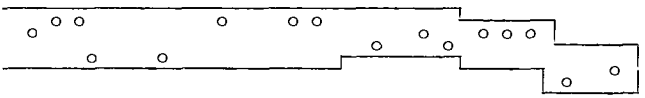
A third illustration of combined intonation contours (given below) is an expanded sentence with a terraced introductory relative clause. The prenuclear and postnuclear margins of the relative clause are lower than its nucleus. The relative clause is followed by a compound main clause consisting of an expanded embedded sentence, "thought he would catch hold of the wagon and climb up," which carries level intonation, and of a serial sentence, "and he missed and fell," which carries terrace intonation. The sentence as a whole carries terrace intonation.

The borders between the introductory clause and the main clause, and between the two components of the main clause, are crossed by level intonation. The borders between components of the complex sentence may be crossed by terrace intonation as in sentence 2 above, or by level intonation as in sentences 1 and 3 and between the components of the compound clauses as in sentence 2.

(25.3)



S3. **mɛ̀: worɔ̀ ba: ye ñ lúgú lɛ̀ // ñ djo worɔ̀ à**
as he come-cp jump cp climb rel cp say he fut



wodórɔ̃w̃ tjɔ̀/ sí lúgú à worɔ̀ kɔ́lɔ́ʔɔ́ ñ tɔ:
wagon-the catch then climb-up and he miss cp fall
"As he jumped up, thinking to catch hold of the wagon and climb up, he missed and fell."

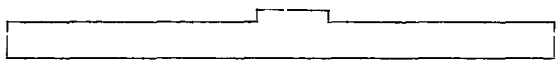
Meaning in the expanded subtype of the complex sentence is related to the occurrence of level or terrace intonation, as the following examples show. The introductory clause and the main clause may be on the same intonation level or on different intonation levels.

(a) Level intonation across component boundaries in complex sentences indicates a state or a relationship. These include the following categories:

* the relative clause introducer sentence: although the relative clause bears terrace intonation, the intonation is level across the boundary between **lɛ̀** and **djo worɔ̀.**

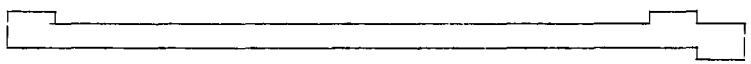
S1. (see example 25.3) (26.1-12)

* the purpose clause introducer sentence:



S2. **mì: i gi sɔ̃̀gí yɛ̀lɛ̀ mjɛ́̃ í pje mì: se:nyɛ̃̀nɛ̃**
I ct think-ct you all des be my family
'I think you should all be my family.'

* hortatory introducer sentence (affirmative):



S3. **pí:bɛ̀lɛ̀ ñ yɛlɛ pe nɛ̃́yí lá: pe sa ñdɛ̀gí lá: ségí má**
child-pl cp right they cow-pl take they go corn take field to
-hort -hort
'The children should get the cows and go get the corn in the field.'

* indirect quote:

S4. **worõ ba: djo wi pje fã̀ʔã̀fɔ̃w̃**
he they-rem p say he be ruler-the
'It was he they had said who should be the ruler.'

* vocative with **pjẽ** 'have, make':

S.5 **à pjẽ:lè sĩ wĩ pje mɔ djo lè/ pĩ:lè ñ bɛ̃: nĩ mɔ nĩ lè**
and rabbit but him tell you say rel child cp agree with you with rel
-pl-the
'But the rabbit told him you (who) say, the children agree with you....'

* indirect statement with know, see, etc., in introductory clause:

S6. **à wi bẽ nya: pe i sjẽ: sã kõ:**
and he them see they ct go-ct go draw (water)
'and he saw them going to draw (water)'.

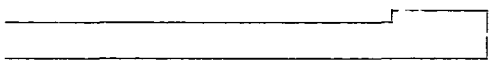
* equational clause + purpose + conditional:

S7. **wà: õ ya: / bĩ gbã̌: sɔʔɔ ĩ // kã pje mĩ: nĩbĩ bã̀ ĩ**
one ct-neg there to able-fut-cp cook neg it-emph be I one it-is-not neg
'There is no one able to cook, except me alone.'

S8. **mĩ: ñ gĩ tjã̀ sjɔ̃: õ sjɔ̃: õ ya: bĩ gbã̌:**
I cp it know person whatever person ct-neg there to able

mĩ: sjɔ: ĩ // kã pje worõ bã̀ ĩ
me save neg it-emph be him it-is-not neg
'I know that no one but him can save me.'

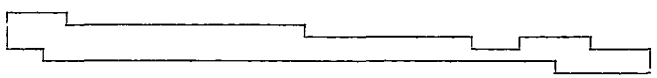
* class identifier clause + relative clause:



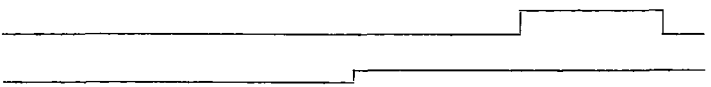
S9. **mĩ: tjɛ̃w̃ bã̃ wi wɛ̃: nã́: ĩ**
my woman it-isn't she this-one here neg
'It isn't this one who is my wife.'

(b) Intonation is terraced across component boundaries in the expanded sentences which indicate a change in status or time, or where a direct quote follows the word **djo** 'say':

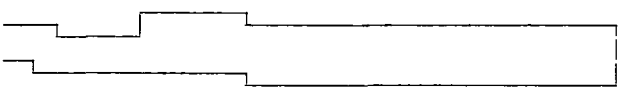
* change in status and time:



S10. **pĩ:bɛ̃le ñ nɛ̃yĩ lã́: / pe sa ñdɛ̃gĩ lã́:/ sɛ́gĩ má**
child-pl cp cow-pl take they go corn take field from
-the -the -hort -the -the
'The children took the cows so that they could go get the corn from the field.'

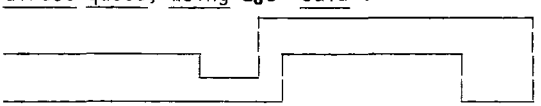


S11. **mĩ: i gi sɔ̃̀gĩ mĩ: à nĩyɛ̃ː yirige sùtánà kólógĩ**
I ct it think-ct I fut myself take-out Satan road-the



ni bĩ kã: zyɛ̀zú má wi gbɛ̃̌: mĩ: syɔ:
in to give Jesus to he-hort be able-fut-cp me save
'I think that I will get myself out of Satan's path, in order to give myself to Jesus so he can save me.'

* direct quote, using **djo** 'said':



S12. **à pĩ:lɛ̀ djo/ ye wi tyeri yaː**
and child-pl-the say you-pl him cut there
'And the children said, "You (pl) should cut him there."'

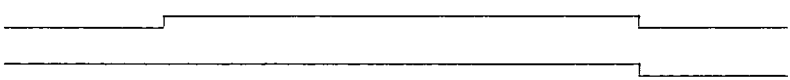
The use of **bĩ** in sentence 11 shows a change of status and time, and therefore terrace intonation is employed across boundaries between constituents. On the other hand, the use of **bĩ** 'to' in sentence 8 shows purpose and is in the same time span, and does not show a change of status, so level intonation is employed across constituent boundaries. Similarly, the use of the hortatory pronouns **pe** in sentence 10 and **wĩ** in

sentence 11 shows a change of status and time and so bear terrace intonation across constituent boundaries. In contrast, the hortatory pronoun **pe** in sentence 3 occurs in the middle of a command and does not show change of time or purpose, and thus bears level intonation.

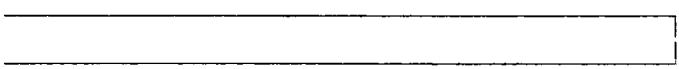
Meaning in compound sentences is related to the occurrence of terrace or level intonation.

(a) Terrace intonation occurs across component boundaries when a second constituent of the compound sentence indicates a change of direction, as in adversative sentences, or when a change of status occurs, as between affirmative and negative constituents, or between question and answer constituents when the question seeks information.

* adversative second constituent: (27.1-9)

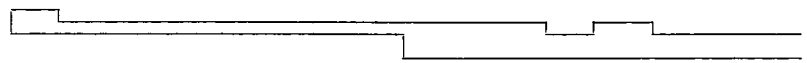


S1. **nĩ: djo mĩ: à pjɛ̀:rĩ / sáa mũ: wɛ̀lɛ́// mɔ sĩ**
then say I fut quiet then-fut-ct cleanse-ct look you-sg but

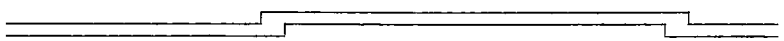


kɔ̃ ba mɔ wɔ̃́w̃ la:la wɛ̀lɛ́/ sĩ nà: wĩ lá:
even come your-sg one-the test look then after her take
'Then (he) said, "I'll be quiet and try to straighten up, but you should be sure and test yours, and after that take her."'

* change of subjects and direction (state ± negative reaction ± result concerning another):

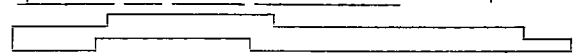


S2. **ka:là li lɛ̀: nà: / li i nyɛ fɛ̀:rɛ̀ kɛ́:le// gi gá yɛlɛ mɔ ĩ**
happen- it that-here it ct be- shame happen- it emph right you des-
ing (n) ing ing (n) -sg fut



da gi nyũ: gbã̌ʔã́mà ĩ// djã̀gɔ́ be kɔ gĩ tjã́ nĩ wɔ̀ nĩ ĩ
ct it tell hard neg so-that they even it know then us with neg
-ct -hort
'This is a happening that is a shameful thing; don't say it loudly, so that they won't know about it and us.'

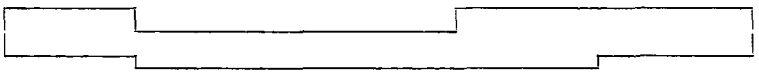
* question and answer constituents (when question seeks information):



S3. **wi i nyàʔá kpɛ́ʔɛ̀lɛ́// wi i yaː wodɛ̃́:ɔ̃ nĩ**
he ct what do-ct he ct there one-sit with
'What is he doing? He's sitting there.'

(b) Level intonation occurs across boundaries between all types of serial constituents of a compound sentence:

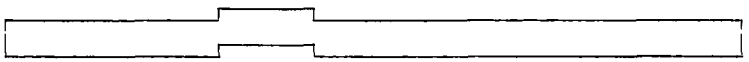
* when the subject is not repeated because it is the same subject:



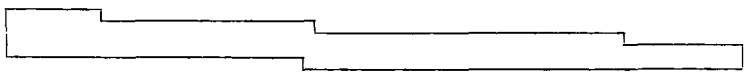
S4. **à wi djo/ mi: tjɛ̃w bɑ̃ wi wɛ: nɑ́: ĩ// nĩ: wĩ yaʔa**
and he say my woman it-isn't she that here neg then her leave
-the -one -cp
'And he said, "**This** one isn't my wife," then (he) left her.'

In the above example, level intonation occurs on the high tones across the boundary between the constituents, but not on the low tones.

* when the second constituent responds to a command or situation:



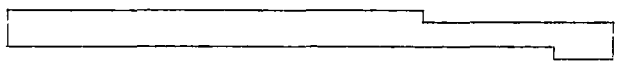
S5. **à pĩ:lɛ̀ djo/ ye wi tjeri yaĩ// à be wĩ tjeri yaĩ**
and child-pl say you him cut there and they him cut there
-the -pl
'And the children said, "You cut him there," **and** they cut him there.'



S6. **nĩ wɔ̃ĩ kɑ̀: kɔ̃: ñ sɑ́ĩ wɛ́lĩ á be baĩ sĩnɛ́**
then also some draw-up cp go-cp bathe then they come-cp lie-down
-cp
'Then (she) also drew some (water) and went and bathed, then they came and lay down.'

(However, when the second subject differs from the first as in the two preceding examples, the high and low tones as represented by the top and bottom lines are both on the same level across the boundary between the two constituents.)

* question and answer constituents which require yes or no answers:

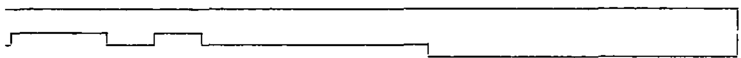


S7. **a pe nɑ̃ĩ lɛ́// ɛ̌: pe ñ nɑ̃ yaĩ**
and they arrive-there q yes they cp arrive there
'Did they arrive there?' 'Yes, they arrived there.'

* cause and result constituents:

S8. **mĩ: i gi sɔ̃̀gĩ: mĩ: à nikɑ̃́ʔɑ̃́w sjɛ̃́:rɛ́ djo: yèlê mɑ́// mɛ̀: lɛ̀/ wi mĩ:**
I ct it think I fut demon words say you to how rel he me
-ct-emph -the -pl

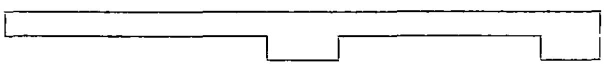
wɔʔɔ ǹ baː̄ sɛ́ː // zã̌gɔ̄ː̄// yèlè mjɛ̃́ ī ra nyɛ́ːrī mīː kéːlì na//
perse- cp come how so-that you all des ct pray my account on
cute -cp -pl -ct -the



àmɛ̀ː lê kɔ̄lɔ̄tjɔlɔ̄ː ā gbã̌ː bje/ sī **mīː** sjɔː **sūtānā mā**
how rel God fut be-able do then me save Satan from

'I think I will tell you **about the demon,** how he persecuted me so, **so that** you can be praying for me (about) how God can save me from Satan.'

* greetings and response constituents:



S9. **yèlè gā ŋūnɔ̄ nāː ī // wɔ̄lɔ̀ i nāː nīdjãʔã̀**
you-pl emph sleep here neg-q we ct here today
'You're all right, aren't you?' 'Yes, we're o.k. today.'

(2) Sentence medial juncture is a slight pause which occurs between components of a complex sentence and sometimes between the nucleus and margin of a simple sentence. It is not as long a pause as sentence external juncture.

Sentence medial juncture is a demarcative feature to unite components of a compound sentence. It is never followed by major sentence stress. Two degrees of this juncture occur: major sentence medial juncture and minor sentence medial juncture.

(a) Major sentence medial juncture is realized as a medium-long pause which is not as long as an external sentence juncture pause but which is longer than a minor juncture pause. It is often followed by secondary sentence stress (page 70).

The phonological groups contiguous to major internal juncture are generally either the same intonation level, or the group following the juncture is lower than that of the preceding unit, except in sentences in which terrace intonation is rising instead of descending.

The phonological group following the sentence external juncture, on the other hand, is always at a higher intonation level than the intonation unit preceding it.

Major sentence medial juncture occurs between phonological rhythm groups which are often coterminous with certain types of grammatical constructions: following the conditional and temporal introductory clauses of a complex sentence, between the main clause and the relative clauses which begin with **àmɛ̀ː** 'like, as', between paratactic compound sentences, and preceding and following embedded explanatory sentences and phrases.

Major sentence medial juncture is represented by //; minor juncture by /. Following are nine examples of the many grammatical constructions with which major juncture normally occurs:

* between conditional or temporal clauses and the independent clauses of complex sentences:

S1. **ǎ fǎʔǎfɔ̃w gá sáː gɔ̃w tjariga ñ wɛ́lɛ́ //** (28.1-9)
and ruler-the emph go-aux-cp chicken-the spread cp look

à wi gɔ̀tyɛ́:gɛ̀lɛ̂ nya: sīː
and he chicken-thighs-the see two
'When the ruler came to spread open the chicken and look at it, he saw the eggs, two of them.'

* between components of a compound conditional clause and a temporal one, and preceding the independent clause:

S2. **lălī ni be baː sínā lɛ̌: // à wi**
time-the in they come-cp lay-down rel foc and he

gá nīː ŋúnɔ̃ // à wi nīː nãmīːgī wɔ̀lɔ̀
emph again-cp sleep and he again-cp pomade-the get-out
'When they came to lie down and when she was again asleep, he again took out the pomade.'

* between a perception introductory clause and the independent clause:

S3. **mīː ñ gī nya:// mɔ ñ tɔ̃nɔ̃ ñ pītjáːw̃ nā: la:la ñ wɛ́lɛ́**
I cp it see you-sg really cp girl-the here examine cp look
'I see that you have really looked this girl over.'

* between serial components of a compound sentence:

S4. **mīː ñ tɔ̃nɔ̃ ñ wī la:la ñ wɛ́lɛ́ gbǎʔǎmā// nī nāː wī lā:**
I cp really cp her examine cp look hard then after her take -cp
'I have really looked her over hard; then after that (I) took her.'

* between paratactic compound sentences:

S5. **wi tofɔ̃w bɛ̄: mă: pje fǎʔǎfɔ̃lɔ̃// wálī sáʔá mă: pje**
his father-the there rem p be ruler money much rem p be

wī mā// àlī tɛ́:w̃ mă: pje wī mā
him to even gold-the rem p be him to
'That father of his was ruler; he had much money; he even had gold.'

* between introductory clauses and indirect hortatory statement and command clauses:

S6. **ye kɔ̃lɔ̃gī yaʔa yaː// wi pɛ̄-mjɛ̃́ sjǎ̃:rī**
you-pl road-the leave there so-that-he them-all greet
'You should let him leave there so he can greet all of them.'

* preceding and following explanatory embedded sentences and phrases:

S7. **lălī ni be sáː sínɛ́ lɛ̌: // à pītjáːw̃ gá ŋúnɔ̃ː //**
time in they go-cp lie-down rel and girl-the emph sleep
-the -aux -emph -emph

nãmĩ:ge mǎ: pje nɔ̃gɔ̃tjãrĩw̃ mã // kũgbolõ nĩ: // ã wi lɔ̃ʔɔ̃
pomade rem p be young-man-the to jar in-foc then he water

le gĩ ni ñ pĩrĩgẽ // ã wi nãmĩ:gĩ bẽ: kã: wõlõ: //
put-in it in cp stir and he pomade-the there some get-out-foc

ñ tɛ̃ʔɛ̃ ñ pĩtjã:w̃ pɔ̃lĩ
cp put-down cp girl-the rub
'(1) When they went and lay down, (2) and the girl was asleep, (3) the young man had some pomade, (4) in a jar, (5) and so he put water in it and stirred it, (6) and he got out some of the pomade, (7) put it down and rubbed it on the girl.'

Clauses and phrases separated by major juncture are numbered in the free translation above. Number 1 is a temporal clause; number 2 is a conditional clause; number 3 is an embedded sentence; number 4 is an explanatory phrase which follows another postpositional phrase "belonging to the young man"; numbers 6 and 7 are serial clauses.

* between the relative clause beginning with **ãmɛ̃**: 'as, like' and the independent clause, which precedes or follows it:

S8. **ã dũrũw̃ nyĩ // ãmɛ̃: gi da pje lẽ**
and gourd-bowl-the be-full like it rem p-cp be rel
'And the gourd was full, like it had been.'

* following an introductory word such as a name or an explanation, or preceding an identification phrase or word following a clause:

S9. **ã wi sã: gĩ djo: wi tõ:w̃ mã // nĩ: djo //**
and he go-aux-cp it say his father-the to then-cp say

ãba:// mĩ: ñ pã nĩ mĩ: tjẽw̃ nĩ
father I cp come with my woman-the with
'And he went and told his father, saying, "Father, I have brought my wife."'

(b) Minor sentence medial juncture is realized as a possible short pause. It may or may not be followed by secondary sentence stress. It is never followed by initial sentence stress. The pause of minor juncture is not as long as that of major juncture. It is realized sometimes as pause, and other times as slight length on the final word preceding it.

Minor juncture is distinguished from closed juncture by the negative characteristic that vowel and consonant elision occur where there is no juncture or closed juncture, but not where there is minor or major sentence medial juncture.

* with closed juncture:

S1. **wi gã fɔ̃lɔ̃ ñ tjewã: kã:ɔ̃ mã ĩ** (29.1-2)
he emph agree cp wife-some give-him to neg
'He didn't agree to give him a wife.'

* with minor juncture:

S2. **mĩ: ñ lĩ tõrĩgõ ya: / wĩ mã**
'I sent it there, to him.'

In sentence 1 above, consonant elision and vowel assimilation occur between **kã:** and **wĭ,** giving the contracted word **kã:ɔ̃.** However, in sentence 2, minor juncture occurs between **yaː** and **wĭ,** and contraction does not occur. Contraction of words does not always occur where there is no juncture, but it is possible for it to occur there between some words. However, contraction never occurs across sentence medial juncture.

Minor juncture, as illustrated below, occurs between phonological groups which may be breath groups or rhythm groups concomitant with the following types of grammatical constructions:

* between series of verbs, nouns, or embedded clauses or sentences that occur within a clause:

S1. **à wi baː mĭ: lá: / ń súrúgú / ń kpɛ́ʔɛ́lɛ́ //** (30.1-11)
and he come-cp me take cp mix-up cp work

nĭː djo / mĭ: ĭ sa̰dɔ̌:gĭ lúgɔ́
then-cp say I des soothsaying-the take-up
'And he came and got me all mixed up, and said I should take up soothsaying.'

S2. **à mĭ: tɔ̀nɔ̀ ń yérɛ̄ / ń dĭ sjɔ: / gba̰ʔa̰mà /**
and I really cp stop cp it receive hard
'And I really agreed to receive it, heartily.'

S3. **mĭ: i gi sɔ̰gĭ/ tjɔ̀logĭ nĭ sa̰dɔ̌:gĭ / kĭ mjɛ̰̄ i mĭ: mà / kanĭdjãna**
I ct it think initia- with soothsay it all ct me to same-thing
-ct -tion-the -ing-the
'I think initiation and soothsaying are for me, alike.'

* between introducer clauses and main clauses in hortatory, locution, and other complex sentences (hortatory clauses are often followed by closed juncture, but may be followed by minor juncture, while locution clauses are often followed by major juncture; however, in long sentences they may be followed by minor juncture or no juncture).

* hortatory clause:

S4. **ki ń ɣɛlɛ / mĭ: ĭ gba̰ː gɛ̀:bé: tɛ̰̀: / yɛ̀lɛ̄ na**
it is right I des be-able that-there show you-pl for
'I ought to explain that to you.'

* locution clause:

S5. **à tjɛ̀:rĭ gã pje / waː ba mĭ: pje / wɛ̀:bé: tjɔ́rɔ̌ /**
and little emph be he-fut come me tell that-there plant
'And a little later he would come tell me, "Plant that".'

* between the main clause and the postpositional phrase:

S6. **worɔ̄ ń djo / mĭ: ĭ fali kpɛ́ʔɛ́lɛ́ / worɔ̄ mà**
he cp say I des work do him for
'He said that I should work for him.'

* in equational sentences between **pje** 'to be' and the following noun phrase:

S7. **wi à gbã: mĩ: lá: wi pje / mĩ: sjɔ̃:**
he fut able-fut me take he-hort be my person
'He would be able to take me as one of his family.'

S8. **dɛ̀:bɛ̀: mjɛ̃̀ i nyɛ / worõ yafũ:rõ**
that-there all ct being his totem
'All that is his totem.'

* following **àmɛ̀: lɛ̀** or **àmɛ̀: lɛ̀ sĩ** 'as, but as':

S9. **àmɛ̀: lɛ̀ sĩ / wi mĩ: wɔʔɔ lɛ̀ ñ sɛ́:ɛ̌ // ki ñ yɛlɛ /**
as rel but he me persecute rel cp so-emph it cp right

mĩ: ĩ gbɛ̃̌: gɛ̀:bɛ̀: tɛ̃̀: / yɛ̀lɛ̀ na
I des be-able-fut that-there show you-pl for
'But, how he persecuted me, I would like to explain that to you.'

* preceding adverbs and following some conjunctions such as **kàdjá:** 'however':

S10. **kàdjã̀: / mĩ: sĩ à gĩ djo: mɔ mã́ / gbɛ̃̌ʔɛ̃́mà**
however I but fut it say you-sg to forcefully
'But, moreover, I will tell you about it clearly.'

Juncture is demarcative since it is optional in many sentences. The above examples illustrate the types of grammatical constructions in which juncture occurs most frequently. However, in long sentences, a minor juncture may be substituted for a major one, or no juncture may occur in a place where normally a minor one would. Compare sentence 3 above with sentence 11 following. The word **sɔ̃̀gĩ** 'thinking' is followed by minor juncture in 3, but normally it is followed by major juncture:

S11. **Kɔ̀lɔ̀tjɔlɔ̀: nĩ mĩ: sɔ̃̀gĩ // wɔ̀lɔ̃ mã́ / dulunyã̀ nyɛ //**
God with I think-ct us to world is

sjɔ̃: nĩ ɔ̀ ná: / wɛ̀: wà: gbɛ̃̌: pje lɛ̀ / bĩ
person again ct-neg here that-one he-fut able-fut be rel to

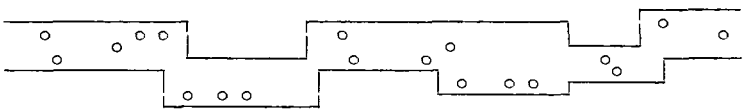
dulunyã̀ kãrĩgã̀ ĩ // ká pje mĩ: nĩ Kɔ̀lɔ̀tjɔlɔ̀: bɛ̃̀ ĩ
world direct it emph be me with God it-is-not neg
'God and I think, the world belongs to us, and there is no one here who can control the world except me and God.'

(3) Secondary sentence stress is a demarcative feature of the complex sentence. It occurs frequently in compound sentences and in certain types of expanded ones, such as quotations. It occurs in addition to sentence initial stress, being on the first word of a noninitial component of a complex sentence following sentence medial major juncture. More than one secondary stress may occur in a sentence.

In expanded sentences, it is often difficult to tell whether the louder volume, slower speed, and higher intonation on a noninitial component are characteristics simply of complex stress subtype 2, of sentence focus, or of secondary stress. Secondary stress and complex stress may always coincide in the complex stress subtype 2. In sentences in which the conditional or other normally initial clause occurs in final position, the characteristics of stress may also be due to focal stress.

In compound sentences, however, secondary stress is more easily identified than in expanded ones. A good illustration of this was given in section 3.4.1. There the second expanded component of the compound sentence begins louder and slower than the final margin phrase of the preceding expanded component, but it begins at a lower intonation level. Louder volume and slower speed are characteristics of secondary sentence stress. The volume of secondary stress is not as loud as that of sentence initial stress of the compound sentence.

Secondary stress in serial compound sentences of the type which begin with a conjunction may be higher than the nucleus of the preceding clause, but not higher than the conjunction of the preceding clause. Higher intonation and loudness on **nî:** mark secondary sentence stress.



(31)

nî: yasînégî pɔ̃lî // nî: wîyɛ: bɔ̃lî // nî: wî pje
then-cp bed-the smear then-cp himself smear then her tell
'**then** smeared the bed, **then** smeared himself, **then** told her....'

(4) Complex sentence stress is a demarcative feature which occurs on both subtypes of the complex sentence. It occurs in addition to sentence initial stress. Complex sentence stress is realized as contrast in louder and softer volume, slower and faster speed, and higher and lower intonation which set off the components of the complex sentence from each other.

Complex stress characterizes the entire complex sentence, whereas sentence stress occurs only on the initial breath group, and focal stress occurs only on the focal word or words of the sentence.

Complex stress occurs in addition to the volume, speed, and intonation features which normally mark the nuclei and margins of the complex sentence. In the softer component of the complex sentence, the characteristics of the nucleus and margin show little contrast and sometimes none.

Two subtypes of complex sentence stress have been distinguished. A third group of complex sentences does not carry complex stress. Both components of this third group are characterized by having the same volume, speed, and intonation.

Vol.	Ld ...	/ M	// SSo	/ VSo	(32.1-3)
Sp.	M MFa ...		// FFa	/ FFa	
Int.	HHi		// LLo		

Sl. **mî: gâ kɛ̂:llɛ̂: ta: nâ: lɛ̂ / târî na// mî:ɔ lî tôrîgô ya: wî mâ//**
I emph affair -that get here rel earth -the on I-cp it send there him to
'If something happened here on earth, I told him about it there.'

(a) Complex stress subtype 1 is characterized by louder volume, slower speed, and higher intonation on the first component which contrasts with softer volume, faster speed, and lower intonation on the

second component. This subtype normally occurs in complex sentences which have an initial conditional introductory clause.

Complex stress subtype 1 also occurs on compound sentences which express statement or condition and result, and on question-answer compounds of the type giving new information.

Vol. LLd // SSo
Sp. SSl (M) // M
Int. HHi // LLo
S2. **mĭ: à ba wà: kpó: // wi à mĭ: pje/ wè:bé: kā:**
I fut come one kill he fut me make that-there eat
'I would kill one, (and) he would tell me, "Eat that."'

Vol. LLd // SSo
Sp. SSl // M
Int. HHi // LLo
S3. **sā wi wĭ nya: // wālĭsjɔ́:bèlè kpaʔā̋ ni**
where he him see money-receivers-the house in
'Where did he see him?' 'In the tax house.'

(b) Complex stress subtype 2 is characterized by softer volume, faster speed, and lower intonation on the first component which contrasts with louder volume, slower speed, and higher intonation on the second component. This subtype normally occurs on complex sentences with initial introducer clauses which may be a quotation clause employing the verb **djo** 'said', a relative clause, an indirect statement clause employing the word **tjā̋** 'to know', or an exhortation employing **sɔ̃gĭ** 'think' in the introducer clause.

Vol. M // MLd (33.1-3)
Sp. MFa // M
Int. LLo // HHi
S1. **à fɛ̃ʔɛ̃fɔ̃w̃ gĭ djo: wĭ má/ nĭ: djo// mĭ: à pjè:rĭ sâa mũ: wélé//**
and ruler it tell him to then say I fut quiet then cleanse look
-the -cp -ct -ct
'And the ruler told him, saying, "I'll be quiet and try to clean up."'

Vol. M // Ld
Sp. M // SSl
Int. LLo // HHi
S2. **mĭ: i gi sɔ̃gĭ // yèlè mjɛ́ ĭ da nyɛ́:rĭ korò ké:lĭ na**
I ct it think-ct you all des-fut ct pray-ct that affair-the on
'I think you all should be praying about the matter.'

Vol. M // MLd M
Sp. M // MSl accelerate
Int. LLo // HHi LLo
S3. **mĭ: ñ gĭ tjā̋// sjɔ̃: ò sjɔ̃: ò yaĭ bĭ gbā̋:**
I cp it know person to person ct-neg there to able-fut

Vol. increase a little
Sp. accelerate
Int. HHi HHi
mì: sjɔ: ì // ká pje worō bǎ ì
me save neg it-emph be him it-isn't neg
'I know no one is able to save me except him.'

(c) A third group of complex sentences does not carry complex stress. They are those which bear level intonation.

Complex stress is limited in occurrence, not normally occurring on indirect quotations, in hortatory or command sentences, nor in indirect statements which include the words **nya:** 'see', **sɔ̄gī** 'think, want', **tja:** 'want':

Vol. M / M (34.1-3)
Sp. M / M
Int. HHi M / M
S1. **à wi pìtjá:bèlè nya: be i sjé: sá kō:**
and he girls-the see they ct go-ct go-aux draw (water)
'And he saw the girls going to draw water.'

Vol. M / M
Sp. M / M
Int. M / M
S2. **ma: wí pje / wi pā nā:**
you-fut him tell he come here
'Have him come here.'

Vol. Ld / Ld
Sp. MSl / MSl
Int. M / M descending
S3. **à pē myɛ̌ djo / mì: à gbǎ: fǎgī nyɔ: ì**
and they all say I fut able kingdom-the make-good neg
'And they all said I can't be good for the kingdom.'

Complex stress does not normally occur on compound sentences which are statement-response, command-response, or greeting-response, or on statement-elaboration, or most serial sentences.

Vol. MLd // Ld // Ld M (35.1-2)
Sp. MFa // MFa // MFa
Int. LLo // Hi // Hi
S1. **à pī:lè djo// ye wi tjeri ya: // à be wi tyeri ya:**
and child-pl say you him cut there and they him cut there
-the -pl
'And the children said, "Cut him," and they cut him.'

Vol. So / So // SSo
Sp. Fa / Fa // MFa
Int. Lo / Lo // Lo
S2. **à mì: wí pje / mì: ǹ gí lô?ó// á mì: kòrò ni gǒbèlè kú:**
and I him tell I cp it hear then I stay ct chickens kill-ct -the
'And I told him, "I understand," then stayed killing chickens.'

The realization of complex stress may be modified somewhat by focus, position in the paragraph, or by the inclusion of one type of sentence within another, but in general all or more of the manifestations listed above are present. In illustrative sentence 2 above, the final component is medium fast, or slower than the fast of the preceding component. This may be due to minor sentence focus since this example is part of a larger statement-result compound sentence. On the other hand, the extra softness on the final clause occurs because of the final position of the clause in the paragraph.

(5) Focal stress in the complex sentence is normal, whereas the simple sentence may or may not have a focal stress. Often the complex sentence has two focal stresses, one of which is primary and the other secondary. Primary focal stress is stronger than secondary. The interval between the tones due to primary focal stress is greater than it is with secondary focal stress.

Both primary and secondary focal stress may occur in expanded and in compound sentences. Secondary focal stress seems to occur more frequently in compound sentences than in expanded ones.

An example of primary and secondary focal stress is given in the section on intonation (see example 25.2). Primary stress occurs on **yīrī** in the introductory clause, and secondary stress occurs on **ná: na** in the main clause.

The following example illustrates primary and secondary focal stress in a compound sentence.

```
Vol.           Ld                     //                MLd      (36)
Sp.                      MFa          //       M        M
Int.           Lo        M   M        //       Hi       VHi
     à fȁʔȁfɔ̃w̃ gī djo: wì má/ nīː djo// mì: à pjè:rī  sáa  mũ:  wélé//
     and ruler it tell him to then say  I fut quiet   then cleanse look
          -the                                             -ct

Vol.          M       /    Ld  Ld          //      MSo
Sp.           M       /    MSl             //      M
Int.          M       /    Hi              //      MHi
     mɔ  sī  kɔ̃  ba   mɔ   wɔ̃w̃ la:la   wélé// sī   ná:   wī  lá:
     you but yet come your one  test    look   then after her take
                           -the
```

'And the ruler told him, saying, "I'll be quiet and <u>try</u> <u>to</u> <u>be</u> <u>good</u> but you be sure and **test your own,** and then take her."'

In the above example, the primary stress is on "test your own" because the loudest volume outside of initial sentence stress, the widest interval between tones, and slower speed occur on it. The secondary stress is on "and try to be good" (then-ct cleanse-ct look). It has the highest intonation, but it has only medium intervals between tones and is medium loud. The two types of focal stress are realized in the above sentence as follows:

	primary stress	secondary stress
Vol.	loud (Ld)	medium loud (MLd)
Sp.		
Int.	high (Hi) (wide interval between tones)	very high (VHi) (medium interval between tones)

The extra high intonation on the words which bear secondary focal stress is due to the complex sentence stress subtype 2 on the first expanded sentence, which causes the main clause to be highest. Also, the entire compound sentence bears complex sentence stress subtype 1, which causes the first expanded sentence to be higher than the second.

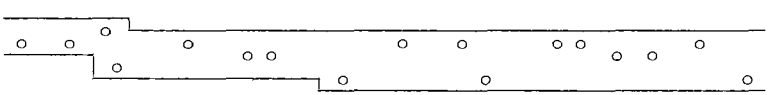
In other sentences, the primary focal stress is often higher, louder, and slower than the secondary.

4 THE PHONOLOGICAL GROUP

4.0 Introductory Concepts

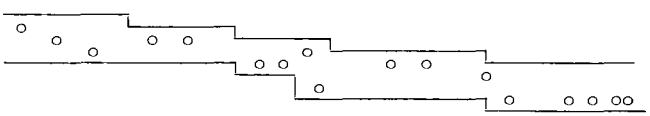
Borders and characteristics of an intermediate level exist which justify setting up the phonological group as an additional level between the sentence and the word. In the hierarchical phonological structure of this language, the levels between the sentence and the word are somewhat fluid since these may undergo change when a word or a phrase is added to a sentence. The phonological group consists of breath groups and rhythm groups, both of which may occur within the sentence.

RG 1 // 2 (37)
BG 1 2 // 1



/// à nyǐgì gá tali // pè mjɛ̃ ségì yáwé:ré i sjé: ñ
and dawn-the emph be-near they all field-the animals ct go-ct cp

RG // 3 ///
BG 2 // 1 2 / 3 ///



sá ni wì sjã́:rí // fã̀ʔã̀fɔ́ẁ sjã:rí yà: kàkèlêò
go-ct him greet-ct ruler-the greet-ct there lizard
'And at dawn, all the wild animals go and greet him, greet the ruler, Lizard, there.'

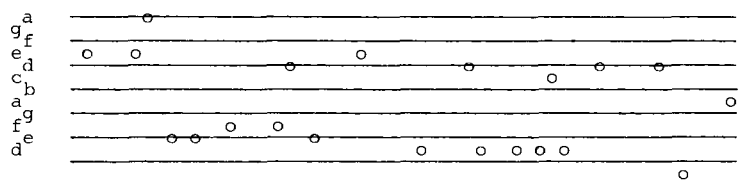
The phonological group may be compared to the grammatical phrase or clause. Often the breath group is coterminous with the grammatical phrase, and the rhythm group with the grammatical clause. However, neither is limited to specific grammatical divisions. A breath group may

consist of a grammatical clause, or a rhythm group may consist of a grammatical word. Example 37, taken from "The Lizard," illustrates this fact. For ease in referring to them, rhythm groups (RG) and breath groups (BG) are numbered above the Intonation line. Sentence medial minor juncture is marked /; medial major juncture is marked //; sentence juncture is marked ///; and the breath groups are underlined.

In example 37, rhythm group 1 consists of one grammatical conditional clause; rhythm group 2 consists of an independent clause; and rhythm group 3 consists of a verbal phrase and an appositional noun phrase. Breath groups constitute phrases and also cross phrase boundaries. In rhythm group 1, breath group 1 consists of a noun phrase, and breath group 2 consists of a verb phrase. In rhythm group 2, breath group 1 consists of a clause extending through the first verb phrase of the compound predicate and into the second verb phrase through the object, and breath group 2 consists of one word. In rhythm group 3, breath group 1 consists of one word which is a noun phrase; breath group 2 consists of two words which comprise a verb phrase; and breath group 3 consists of a noun phrase which is a proper name.

Phonological group borders may change within a given sentence when, for example, a clause which would be a rhythm group becomes a breath group in a complex sentence. In example 37, the first breath group of the second rhythm group illustrates this. Often a verb phrase which begins with the words **ñ sâ:** 'and go' constitutes a new rhythm group or at least a new breath group. Whereas in the example cited it is part of the same breath group as the preceding verb phrase, in the following example, the same words constitute the initial words of a new breath group and of a new rhythm group:

RG 1 / 2 (38)
BG 1 2 / 1 2



mĭ: pĭ:bèlē ñ nĕyĭ lā: / ñ sā: ñdĕgĭ lā:/ ségĭ mā
my child-pl cp cow-pl take cp go-cp corn take field to
-the -the -the -the
'My children took the oxen and went and got the corn at the field.'

In example 38, the rhythm groups are separated by sentence medial minor juncture, but the breath groups within the first rhythm group are not. Breath group 1 includes the subject noun phrase and the tense-aspect marker **ñ** 'have' because the latter is a phonetic clitic with the preceding word (**pĭ:bèlē ñ** 'the-children-have') and is an expanded word. The change of intonation level of the breath groups does not occur across the boundaries of the breath groups, but it occurs elsewhere between the nuclei of the words on each side of the border. The two breath groups cited do occur on different intonation levels since the

rising tone on **nɛ̃:yĩ** is at a lower intonation level than is the rising tone on **pĩ:bɛ̀lɛ̃.** The intonation change occurs following the nucleus of the latter word, on the suffix **-bɛ̀lɛ̃** 'the' (pl).

4.1 The Breath Group

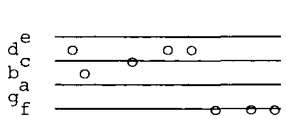
The breath group is the basic subtype of the phonological group. It is the level below the rhythm group and above the word. Up to four breath groups occur in a rhythm group. Its borders are potential pause, which is minor juncture.

Each breath group may be composed of from one basic or complex word to four or five that are not broken by a breath and that are on the same intonation level, except when bearing focal stress or when in sentence-margin position. A breath group may cross grammatical phrase boundaries, but it often is coterminous with a grammatical noun phrase, verb phrase, or postpositional phrase. It is called a breath group because a breath is not taken medially within the group. Although a rhythm group may be broken by breaths between breath groups, this is not usually done.

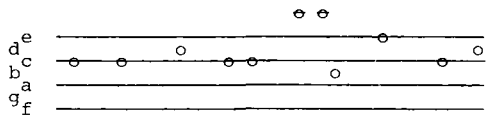
Borders of the breath groups may or may not be marked by sentence medial minor juncture, but they are never marked by major juncture unless the borders of the breath group are identical with the borders of the rhythm group.

Although breath groups may be separated from each other by their different intonation levels, their borders do not coincide with the place where the change of intonation occurs (see page 86) unless the borders of the breath group and rhythm group are the same. Terrace intonation change occurs with the breath group on the margin following its nucleus.

(39)



S1. **nĩ: ya-sĩnɛ́gĩ pɔ̃lĩ**
then bed-the smear
-cp
'then smeared the bed'



S2. **mĩ: ɔ̃ tja: nĩgɔ̃-tjárĩw̃ bɛ́: na ĩ**
I ct- want man-young there on neg
neg -ct -the
'I don't want anything to do with that fellow.'

In the above examples, the breath groups are underlined. In both sentences 1 and 2, final margins of breath groups bear terrace intonation on the final syllable of the nouns **yasĩnɛ́gĩ** 'the bed' and **nĩgɔ̃tjárĩw̃** 'the young man'. The final syllable in each case is the grammatical suffix which follows the noun nucleus, and it is the margin following the nucleus of the breath group.

The breath group is often identical with the word. A breath group of more than one word contrasts with the compound word by the lack of consonant and vowel sandhi across open juncture between the words of the breath group. The compound word, on the other hand, does have features of vowel and consonant sandhi which occur across internal open juncture between its components (see page 175).

Some fluctuation between breath groups and compound words occurs in the realization of a few pairs of verbs, when these verbs together have a different meaning from that of each one separately. For example, the sequence **ŋ̃ ñ ta:** (breathe cp have) together mean "rest." Some speakers pronounce this as a compound word when it is in the completive aspect, but as a breath group when it is in the continuative aspect, as shown:

in the completive aspect	versus	in the continuative aspect	(40)
mĩ:ñ ŋ̃-ñda:		**mĩ:i ŋ̃gĩ ni da:gi**	
I-cp breathe-have		I-ct breathe-ct ct have-ct	
'I rested.'		'I am resting.'	

The absence of the completive aspect marker between the two verbs, and the voicing of the consonant of the second verb is evidence that the verb sequence on the left is a compound verb. The verb sequence in the example on the right has an aspect marker between the verbs, and the voiceless consonant of the second verb remains voiceless. Therefore, it is pronounced as a breath group and is not a compound word.

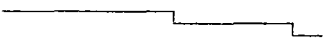
Another type of example shows fluctuation between compound words and breath groups. The reflexive pronoun and the following verb may be pronounced either as a compound word or as a breath group. It may be pronounced as:

a breath group			or	a compound word		(41)
wĩyɛ̃ da:	~	**wɛ̃̀ da:**		**wĩyɛ̃-da:**	~	**wɛ̃̀-da:**
self have		himself have		self-have		himself-have
'recuperate'				'recuperate'		

Another evidence of changes from breath group to compound word is to be seen in tone sandhi in noun sequences (page 81f.). Comparisons of verbs and verb phrases and nouns and noun phrases may be seen in charts 6 and 8.

4.1.1 The structure of the breath group consists of an obligatory nucleus and optional margins which may be preposed or postposed to the nucleus. Both nucleus and margin may be simple or complex. The following example illustrates a complex postnuclear margin. The margin is realized as one complete breath group and part of another. In this example, the margins and nucleus are separated by / and the breath groups are underlined. Intonation is indicated by the line above the example.

(42)



nĩgɔ̃tjârĩ / w̃ bɛ̂:/ na ĩ
man-young-the there on neg
NUCLEUS / INNER / OUTER
MARGIN MARGIN
'not of that young man'

Example 43 from "The Snake" illustrates a prenuclear margin and a complex nucleus which are all part of a single breath group. The margin is at a slightly lower intonation level than the nucleus in both cases. In example 42, the inner margin is at a higher intonation level than the outer margin.

(43)

kɔ̃gĩ / lá: ñ tɛ́ʔɛ́ ñ djo
hand-the take cp put cp say
MARGIN/ NUCLEUS (COMPLEX)
'reached out her hand desiring to'

The margins and nuclei are identified by grammatical criteria and meaning, and also by intonation and sometimes volume. Example 43 illustrates a rhythm group containing one breath group. In this case the margin and nucleus are the same for both the breath group and the rhythm group. Both carry level intonation, as indicated by the level intonation of the low tones, but the margin and nucleus are reflected in the intonation level of the higher tones, as indicated by lines above the examples.

In example 42, the postnuclear margin is complex, consisting of an inner margin and an outer margin. The slight downward intonation begins with the inner margin which is the noun suffix. The intonation is terraced again on the outer margin **na ĩ** 'of not'. This example is taken from the clause **mĩ: ɔ̃ tja: nĩgɔ̃tjãrĩw̃ bɛ́: na ĩ** 'I don't want anything to do with that fellow'. This is shown with a graph above it in number 2 of example 39 in the preceding section. This clause carries level intonation, but it is the final part of a sentence that carries terrace intonation, and the terrace intonation is imposed on the final part of the sentence on the margin of the final breath group.

4.1.2 Features of the breath group: (1) word juncture, (2) consonant and vowel elision and assimilation, (3) consonant voicing, (4) tone sandhi in noun phrases, (5) tone sandhi in verb phrases, and (6) allotones.

(1) Word juncture occurs within phonological groups between words. It is realized as a possible slight pause which is preceded often by a minor unstressed syllable and is followed by a syllable bearing stress. Tone sandhi, except in some noun phrases, and consonant sandhi of the type occurring in complex words (pages 181 and 175) may not carry across word juncture.

(2) Elision of consonants, vowels, and tones resulting in contractions of words which would not normally be contracted, occurs within breath groups, but never occurs across breath group boundaries. A series of words may occur in one sentence as a single breath group and in another as two, depending on the length of the sentence. In the following examples, the rhythm group borders are marked by // and the breath group borders are marked by /.

S1. **/// nĩ: lɔ̀gà: // kã:ɔ̃̄ má/ ɔ̀ɔ wɛ́lĩ// nĩ wɔ̃: ...** (44)
then-cp water-some give-him to and-he bathe then also-cp ...
'Then (she) gave him some water and he washed, then also...'

S2. **/// àwi nĩ: to:/ wà: na:// à wɛ̀:bé: kãrĩ / wĩ má///**
and-he again-cp fall one on and that-one-there go him to
'And he chose another one, and he went to him.'

In example 44, the breath group **kã:ɔ̃̄ má** (give-him to) would be **kã: wĩ má** in slower speech. However, in the first sentence, the same words occur in a single breath group instead of in two because they are in

medial position in a long sentence and are therefore spoken rapidly. Sentence 2, on the other hand, comprises a medium-length compound sentence containing two rhythm groups and four breath groups. In this example, the words **kārī / wī mā** (go-him to) occur in two separate breath groups. While in sentence 1 the verb and pronoun **wī** are contracted, they are not contracted in sentence 2.

(3) Voicing of consonants results when voiceless consonants of general class pronouns occurs medially in a breath group.

```
S1. mɔ  gá  tjã̋   ga̍ː   pje fɛ̄ːrɛ̀ ì          (45.1)
    [mɔ  gá  tjã̋  ki à   pje fɛ̄ːrɛ̀ ì]
    you emph know it fut be  shame neg-q
    'Don't you know it will be shameful?'
```

The pronoun **ki** plus the tense aspect marker **ã** become **ka̍ː** and the **k** becomes **g.** There is no juncture medially in the rhythm group when the consonant becomes voiced. But when a juncture occurs between **tjã̋** and **ka̍ː,** the **k** of the pronoun remains voiceless.

```
S2. / mìː ǹ  gī tjã̋ /  ka̍ː   pje fɛ̀ːrɛ̀ /      (45.2)
      I  cp it know  it-fut be  shame
      'I know it will be shameful.'
```

Example 45, sentence 1 above is realized as one breath group, but sentence 2 is realized as two.

The voicing of consonants affects only the general class pronouns in this position. However, voicing does occur in fluctuation with nonvoicing in some other words. In these cases when voicing occurs, the word has become a compound word. It fluctuates usually with a breath group of two separate words when there is no voicing.

```
S1. àmɛ̀ː lè/   wa̍ː  gbȁã-bje //   sí  mìː sjɔː     (46)
S2  àmɛ̀ː lē/   wa̍ː gbǎː    pje //  sī mìː sjɔː
    how  rel  he-fut able be      then me  save
    'how he will be able to save me'
```

In example 46, the two words **gbǎː pje** in sentence 2 have become one compound word, **gbȁa-bje** in sentence 1. The voicing of the consonant on words other than general class pronouns occurs only in compound words (see page 175).

(4) Tone sandhi is limited in breath groups to only certain noun phrases and postpositional phrases. In noun phrases it resembles two syntactic types of tone sandhi which occur in compound words (see page 181).

The difference between the compound word and the breath group at this point is the fact that the tone conditioning carries across internal word juncture in the word but across external word juncture in the breath group. Also in the word, tone sandhi is obligatory between certain components, but in the breath group it is optional between those same components.

compound word		breath group	(47)
1. **lòmúrú-lɔ̃ʔɔ̃**		2. **lòmúrúw̃ lɔ̃ʔɔ̃ ~ lòmúrúw̃ lɔ̃ʔɔ̃**	
[lòmúrú + lɔ̃ʔɔ̃]	**lòmúrú-lɔ̃gĩ**	[lòmúrú + lɔ̃ʔɔ̃]	
lemon + water	lemon-water-the	lemon + water	
'lemon juice'	'the lemon juice'	'the lemon's juice'	

In example 47 number 2, either the low tone on the second component may be realized as high tone, or the phrase may be enunciated without tone change. There seems to be a slight nuance of meaning in the breath group between the example with the tone sandhi and that without it. When tone sandhi occurs, the two components seem to have a closer tie than when there is no tone change.

Tone sandhi also occurs in noun phrases consisting of pronoun plus noun or noun plus noun. When the first component bears mid tone, the second component is raised one tone.

1. **sjɔ̃: pja**	2. **mɔ kɛ̃:le**	(48)
[sjɔ̃: + pjà]	[mɔ + ke:lɛ̃]	
person + child	your-sg + affair	
'the son of man'	'your fault'	

Tone sandhi occurs in postpositional phrases when the object is a general class pronoun. The object tone is realized as high or low, depending on the tone of the postposition. Stated in the form of a rule:

Mid tone is realized as:

high tone preceding a postposition of **mid** tone; and as
low tone preceding a postposition of **high** tone.

1. **mi gi taʔa gĩ na**	2. **mĩ: ñ lĩ: gĩ** na	(49)
you it place it on	I cp eat it of	
'You must place it on it.'	'I ate of it.'	
3. **mĩ: ñ gĩ kã: wĩ mã́**	4. **pe ñ gĩ múgú wĩ mã́**	
'I gave it to him.'	'They opened it for him.'	

(5) Tone sandhi in verb phrases occurs within breath groups and acts as a cohesive feature. These tone alternants are limited to general class pronoun objects in verb phrases. They are partially phonologically conditioned and partially morphologically conditioned.

The general class pronouns **wi, gi, yi, ge, li, be, di, bi** normally bear mid tone and are unstressed unless they are in clause initial position. Within the verb phrase, general class pronouns are conditioned by the tones of the verb phrase components immediately preceding them, and by the tones of the verbs following them, according to the following rules:

Mid tone on the pronoun is realized as:

mid between **mid** tone and **mid** or **low** tones: (50)

wi màa gi lĩ: 'She has eaten it.'
she rem p it eat

wi i gi tja: 'She wants it.'
she ct it wanting

low between **mid** tone and **high** tone:

wi i gĩ lĩ: 'She is eating it.'
she ct it eating

high following **high** or **low** tones:

pe ñ gĩ kpɛ̃ʔɛ́lɛ́ 'They did it.'

wi gã gĩ tjã̄ ĩ 'He doesn't know it.'

wi à gĩ lĩ: 'He will eat it.'

mɔ à kɔ̃ gĩ djo: ĩ 'You mustn't say it.'

When the constituent preceding the general class pronoun is elided, the tone on the pronoun is still realized as mid, low, or high according to the tone of the elided constituent and of the following one. For example, either **ñ** or **ĩ** is elided when another word is preposed to the subject.

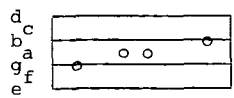
without preposed word: preceding word is not elided	with preposed word: preceding word is elided	(51)
S1. **mĩ: ĩ gĩ kpɛ̃ʔɛ́lɛ́** I ct it do-ct 'I do it.'	S2. **korɔ̃ na mĩ: gĩ kpɛ̃ʔɛ́lɛ́** that on I (ct) it do-ct 'So I do it.'	
S3. **pe ñ gĩ kpɛ̃ʔɛ́lɛ́** they cp it do-ct 'They did it.'	S4. **korɔ̃ na be gĩ kpɛ̃ʔɛ́lɛ́** that on they (cp) it do 'So they did it.'	

Sentences 1 and 3 in example 51 do not manifest elision of the tense-aspect markers **ĩ** and **ñ**, while sentences 2 and 4 do. By comparing sentence 1 (which has **ĩ**) with 2 (from which **ĩ** has been elided), and also by comparing 3 (which has **ñ**) with 4 (from which **ñ** has been elided), it will be noted that the tone on the pronouns in sentences 1 and 2 is the same, and the tone on the pronouns in sentences 3 and 4 is the same.

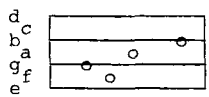
It is also to be noted that between two high tones or between a low and a high tone, the high tone of the pronoun is realized as phonetic lower-high tone. This allotone is a cohesive feature which will be explained below.

(6) Allotones characterize breath groups. Allotones usually occur medially in the breath group, but not across breath group boundaries. They are the realization of a medial tone between two different tones in which the progression is from a lower to a higher tone. In example 52 number 1, the mid tone on **wi** is lower mid, between low and mid tones. In

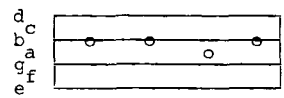
(52)



1. / **à wi i tja:** /
and-he ct wants
'and he wants'



2. / **worɔ̃ ĩ sã** /
he-des go
'he would go'



3. / **sĩ nã: wĩ lã:** /
then after her take
'then take her afterwards'

number 2, the high tone on **ī** is lower high, between mid and high tones. The allotone occurs on the **wī** in number 3, where the high tone became lower high.

Allotones usually occur across borders or between an expanded word and another word within a breath group. In each of the three preceding instances, allotones occur on the final tone of the expanded word preceding another word in the same breath group. They do not occur initially on the word, on the first syllable of a new breath group, or medially within a word.

4.2 The Rhythm Group

The rhythm group is the second subdivision in the phonological group. It is the level below the sentence and above the breath group. Up to four rhythm groups generally occur in each simple sentence, and each rhythm group is composed of from one to four breath groups. The rhythm group differs from the breath group by its having distinctive borders, by its control of the timing of the phonological group, and by its relation to terrace intonation. The rhythm group contrasts with the breath group also in the placement of terrace intonation, which may occur across rhythm group borders but not across breath group borders (see page 86).

The rhythm group is often coterminous with a grammatical clause, a word, or a sentence, as has been illustrated in the preceding sections.

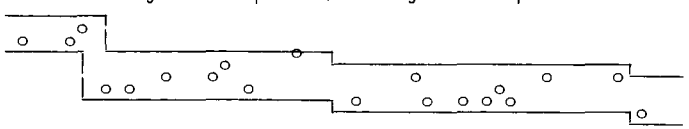
4.2.1 Rhythm group structure comprises an obligatory nucleus and optional margins which may precede or follow the nucleus. Both nucleus and margins may be either simple, with one breath group in each, or complex with more than one breath group. The following graph of an example from "The Wagon" illustrates the nuclei and margins of two rhythm groups.

OUTER MARGIN/INNER MARGIN/NUCLEUS/ NUCLEUS / MARGIN (53)

Vol. Ld M MLd Ld Ld MSo

Rhythm Group 1 / Rhythm Group 2

Int.



mĭ: pĭ:bēlē ñ nĕyĭ lá: / ñ sâ: ñdĕgĭ lá: ségĭ mā

my child-pl cp cow-pl take cp go-cp corn take field to

-the -the -the -the

'My children took the oxen and went to the field and got the corn.'

The verb **lá:** is the nucleus of each rhythm group, although the nucleus of the second rhythm group also includes the words preceding **lá:**. Notice that the nucleus in each rhythm group is louder than the margins. In the first rhythm group, the first breath group is very loud through the first two syllables of **mĭ: pĭ:bēlē ñ** because of initial sentence stress, and in this case discourse initial stress. However, the latter part of this breath group, **bēlē** and **ñ**, are medium volume. This is the outer margin. The intonation is very low also. It rises on the lower tones

toward the nucleus **lā:**, but just before **lā:** the final low tone of **nɛ̌yī** drops lower than the preceding low tones. This increases the interval between high and low tones on **nɛ̌yī lā:** and increases the loudness on the nuclear word **lā:**, which is also the focal point of the sentence. The margin in the second rhythm group follows the rhythm group nucleus. It has lower volume and lower intonation.

The characteristics of the nuclei and margins of the phonological groups may be modified because of the overlaid characteristics of the higher levels such as the sentence and the paragraph. Note in graph 7, "The Lizard," that sentences 6, 7, and 8 become softer and more accelerated as they near the end of the paragraph.

4.2.2 Features of the rhythm group:

(1) The borders of the rhythm groups are marked by sentence medial juncture, which may be major or minor. This differs from the breath group whose borders may be realized as minor juncture but never as sentence medial major juncture.

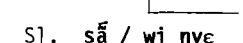
The borders are further realized as a potential pause across which vowel, consonant, or tone reduction and assimilation do not occur. This is in contrast to the breath group whose border may be crossed by the voicing of consonants (see page 81).

(2) Rhythm groups enable phonological groups to fit within a limited time span by the acceleration or deceleration of the components of a given phonological group. It is to be noted that in the following examples the long phonological groups are accelerated according to the number of components within them, and where there are shorter components, they may be decelerated.

The rhythm may be further modified by diminishing speed because of the sentence nucleus, focal stress, or sentence stress. It may also be modified by accelerating speed in rhythm groups which occur in the margins of the sentences. Rhythm carried over from paragraph and discourse level may also further modify the speed of a rhythm group.

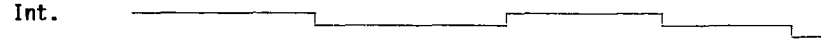
In the following examples, the numbers 1 to 4 refer to the number of rhythm groups (RG) and breath groups (BG) in the utterances. Breath groups are underlined.

RG 1 / 1 (54.1,2)
BG 1 / 1
Int.



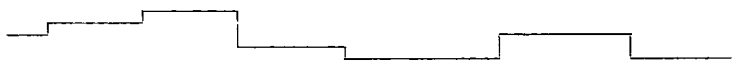
S1. **sɑ̃̄ / wi ŋyɛ**
where he be-ct
'Where is he?'

RG 1 / 2 //
BG 1 2 / 1 2 //
Int.



S2. /// **lɑ̌lī ni wi sɑ̄: sīnɛ́ lɛ̌:// ɑ̀ pītjɑ́:w̃ gɑ́ ŋũnɔ̄:// **
time-the in he go-cp lie-down rel and girl-the emph sleep

RG 1 / 2
BG 1 2 3 4 / 1 2
Int.



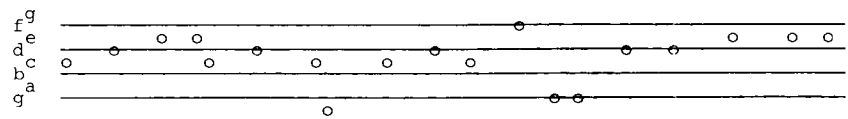
à wi nĩ: nãmĩ:gĩ bɛ̃: kà: wɔ̀lɔ̃ / mà pĩtjá:w̃ pɔ̀lĩ ///
and he again pomade there some take-out cp girl-the smear
-cp -the
'When he lay down, and the girl was asleep, he again got out the pomade and smeared the girl.'

(3) Terrace intonation functions as a cohesive, demarcative feature although it is not distinctive at the phonological group level. It may occur rhythm group medially within breath groups and between inner and outer margins of breath groups. Also, larger changes in terrace intonation levels may occur across the borders of rhythm groups.

In example 55, breath groups are underlined and the rhythm groups are separated by /. Sentence borders are indicated by ///. The letters on the left of the graph are marked according to the eight-note musical scale in order to show the actual intervals between tone levels. The intonation is terraced, so that within each rhythm group the high tones of one breath group are lower than the high tones of the preceding breath group. However, the interval between the terrace levels of rhythm groups is greater than it is between those of the breath groups within the rhythm groups.

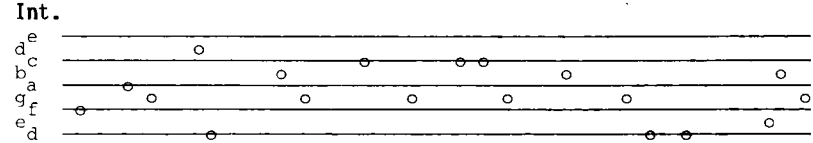
In sentences in which level intonation occurs within a part of the sentence, the rhythm groups may be at different intonation levels.

RG 1 / 2 (55.1, 2)
BG 1 2 / 1 2
Int.

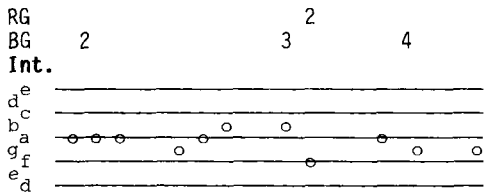


S1. **à wi gá sã: djɛ́: ya: // à wi pĩtjá:bɛ̀lɛ̀ nya: be: sjɛ́: sã́ kɔ̃́:/**
and he emph go enter there and he girl-pl-the see they go-ct go draw
-cp -ct (water)
'And having entered there, he saw the girls going to draw (water).'

RG 1 2
BG 1 2 1
Int.



S2. **à worɔ̀ sá: kɔ́gĩ lá: ɲ̃ tɛ́ʔɛ́ ɲ̃ djo / worɔ̀ à nyá:gĩ**
and she go-cp hand-the take cp put cp say she fut grass-the



kɔ̃nɔ̃ʔɔ̃ / tàmatī: nyŭgì lā:rā ni
pull-out tomato head underneath in
'She reached out her hand desiring to pull the grass around the roots of the tomato plants.'

In example 55 sentence 1, both rhythm groups have terrace intonation. In the first rhythm group, the high tone on **sā:** in the first breath group is a little higher than the high tone on **djē:** in the second breath group of the same rhythm group. In the second rhythm group of sentence 1, there is also a gradual terrace intonation. The width of intervals between intonation levels is not great because the rhythm groups are medial in the sentence. The sentence is not completed in the example. In sentence 2, however, the differences in width of intervals between the intonation levels of the two rhythm groups are greater, due to the kind of sentence and to the necessity of setting off the grammatical clauses from each other. However, the final rhythm group rises almost as high as the first one, since it is in nonfinal position in the sentence and is rising toward the sentence focus, which is not shown in this part of the sentence. In the first rhythm group of sentence 2, the breath groups are at different intonation levels. Notice that the words **lā: ñ tɛ́ʔɛ́ ñ djo** are at the same intonation level. The low tone of the word **kɔ̃gì** is at the same intonation level as the low tones on **ñ,** but the high tone on **kɔ̃gī** is at a slightly lower level than on **lā:,** since **kɔ̃gī** is the margin and **lā:** is the nucleus of the phonological group. This is reflected in the slight variation of intonation.

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Part II

THE LOWER LEVELS

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5 PHONEMES AND PROSODIES

5.1 Inventory

The inventory of the segmental phonemes of this language includes sixteen consonants, seven vowels, and five suprasegmental (prosodic) phonemes. Of these, tone consists of five tonemes. Three nonphonemic demarcative features complete the total picture and are described in section 8.2. The phonemes and distinctive prosodies are shown in the chart on the following page; full descriptions are given in chapter 8 and may be located by consulting the index to this volume.

In the chart, the phonemes are arranged in classes with articulatory labels, but these also constitute function classes in the phonetic structure as determined by the prosodic features which may accompany them. The prosodies are listed at the right, together with the phonemes with which they are most noticeably manifested. They function at the level of the word and so are treated with it in chapter 8.

5.2 Description of Phonemes

Phonetic realizations are described according to place and manner of articulation. Full examples of minimally contrasting sets for each position class and formation class are given in charts 3a and 3b. Except for tone, the prosodies are combined with these sets; tone distribution is found in chart 10. This interpretation conforms to data recorded by linguists in West African languages. Examples in the charts and throughout this study are written semiphonetically in cases where the phonemic transcription would cause difficulty to the reader who is accustomed to the Senoufo orthography used in existing literature. For example, the variant [ř] of the phoneme /d/, occurring at the beginning of unstressed syllables, is written as r, and [ɲ] is written as ny. Voiceless phonemes are written voiced where they are phonetically voiced, and the secondary (delayed) release feature is written phonetically as Cj, Cw, and Cm. But where focus is on the alternation itself, both the phonemic and phonetic transcriptions are given. However, the 1982 change in Senoufo literature from ty to c and dy to j for the palatal stop major variants of the palatalized stops has not been incorporated in this work. Mid tone is not written in the phonemic form.

Chart 2

INVENTORY OF PHONEMES AND PROSODIES

Phonemes

Consonant Phonemes

	Labial	Alveolar	Palatal	Velar	Labiovelar	
Stops						+CR
Voiceless	p	t		k	kp	
Voiced	b	d		g	gb	
Fricatives						
Voiceless	f	s				
Voiced	v	z				
Nasal	m	(n)	(ɲ)	(ŋ)*		
Approximants		l	y	w**		

Vowel Phonemes

	Spread Front	Spread Central	Rounded Back	
High close	i		u	+ ˜
Mid close	e		o	+ : + ʔ
Mid open	ɛ†		ɔ	+ ˜
Low		a		

Prosodies

Tone: High /ˉ//, Low /ˇ/, Mid /¯/, Descending /ˆ/, Rising /ˇ/

Length: CV:

Secondary release: CR

Nasalization: ˜

Glottalization: ʔ

* n, ɲ, and ŋ are marginal phonemes (p. 96f.).

** w is listed as a velar because it functions like velars and because the nasal manifestation of w is velar [ŋ]. Phonetically w is a labiovelar.

† ɛ is always long; it never occurs except with length.

Chart 3a
CONSONANTS

Examples of minimally contrasting sets of consonants with accompanying pertinent prosodies.

Position Classes (Points of Articulation)

Labial	Alveolar	Palatal	Velar	Labiovelar
pari to cross	**tárígá** adhere		**kara** be messy	**kpàrà** to compete
párá to sell	**tàlì** be accustomed		**kà?à** village	**kpa?a** house
bàrì to chat	**dariga** to dazzle		**gàraga** wood carrier	**gbàrà** sponge of plant
baraɔ carp	**dàlì** chimpanzee		**gàlà** indigo	**gba?alagà** bedbugs
fari crush between	**sàrì** needle			
fa?a be light	**sá?a** many			
fálá to farm	**sálá** to peel			
vàlá farming (n)	**zàrí-djogo** multimmate rat			
vã̌:-vã?ã mud dauber	**zà?á** rain			
màrà to conserve	**nàrì** misfortune	**nyari** to shake off	**ŋà?ã̀nà** to endeavor	
mànì rice	**lá?á** take off of	**ya?a** to leave	**wa?a** become dry	

5.2.1 Consonants tend to be fortis in stressed position except in words with the feature of length where they are more lenis (page 142). The stops occurring medially in unstressed position have quick, light contact which may result in a flap or a fricative. These variants are given in detail beginning on page 128f.

Formation Classes (Manner of Articulation)

pã̀ to come	**tã̀** to carve (wood)		**kã̀** to boil	**kpã̀ɔ̃** mouse (with long hair)
pã́nã́ partly full	**tã́gá** to touch		**kã́ʔã́** to bewitch	**kpã̀:rà** cowries
bã̀ it isn't	**dã̌:** to please (ct)		**gã̌nã** tooth	**gbã̀** become hard
bã̀-bɛ́: clay bed	**dã̄gá** to curse someone		**gã̀ʔà̀gà** crab	**gbã̀ʔã̄mã** very much
mã: coming	**nã** to arrive	**nyã̄** to swim	**ŋã̌ɔ̃** twin	
mã̀ʔà̀ to circle	**nã̀ʔà̀** to herd	**nyã̀ʔà̀** to bark	**ŋãʔà̀** arrowhead	

Voicing

Voiceless	Voiced	Secondary Release Voiceless	Secondary Release Voiced
pà: some	**ba** to come-aux	**pjà** child	**bjà** sheep
pɔʔɔ to heal	**bɔlɔgɔ̃** vine (type of)	**pwɔ:** to tie	**bwɔ̃ʔɔ** leaves used in sauce
tà: some	**dà:là** courtyard	**tja:** to want	**dja:la** breaking (n)
tɔlɔgɔ leg	**dɔ̃rɔ̃** worms	**tjɔlɔɔ̃** woman	**djɔli** to sew
ká: to chew	**gá** if	--	--*
kɔ̃ yet	**gɔ̃rĩrɔ̃** cotton	**kwɔ̃:** to finish	**yá-gwɔ̃:** only
kpɔ̃ town name	**gbɔ̀̃** baboon	**kpmɔ̃́:** to hit	**nɛ̀-gbmɔ̃́:ɔ̃** herb doctor
fálá to farm	**vă:** a swing	**fjà:là** to hurry	**sɛ̀-vjá:** fearlessness
sã:ri to smooth out	**zã̌-lɔ̀:lɔ̀** kidney	**sjã́:rí** to greet	**zjà:rà** nest

* No example of kj or gj has been found in the Tyebaara dialect.

** Although [gbm] and [vj] have been found in word medial position, they are voiced variants of /kpm/ and /fj/. No phonemic voiced forms have been found in this dialect.

Chart 3b

VOWELS

Examples of vowels showing minimal contrast in all prosodies except tone.

Short	with length	With length and glottalization
tire to grind	**ti:re** trees	---
téríré immediately	**té:rí** putting down	**te?ere** name of village
---	**té:rì** the saliva	**tɛ?ɛlɛ** to insult
tárígá to stick on	**ta:ri** to be placing (on)	**ta?arà** following one
tɔ́rɔ́ to track	**tɔ:rɔ́** to be in poor health	**tɔ̀?ɔ̀rɔ̀** to stutter
tórígó to send	**to:ri** catching	**to?oro** to be stunted
túgú to dig	**tu:go** to rub together	---
tűrú digging		

Oral		Nasal	
Short	Long	Short	Long
ti it, they	**tí:** stop	**tĩ́** become full	**tĩ́:** weaving
tɛ̌gî the hoe	**tɛ̂:gí** being unaware of	---	---**
---*	**tɛ:̀** gold	---*	**tɛ̃̀:** to explain
ta progressive part.	**ta:** to get	**tã** to carve wood	**tã̌:** becoming sharp
tɔ: to grow thick	**tɔ́:lí** now	**tɔ̃́** to close	**ŋɔ̃-tɔ̃́:nɔ̃** long knife
tolõ a squirrel	**to:lo** a fall	---	---**
túgú to dig	**tu:go** to rub together	**tű̃gú** fighting	**tũ:** falling

* There is no phonemic short /ɛ/ or /ɛ̃/, although short [ɛ] and [ɛ̃] occur as variants of /a/ and /ã/.
** There is no nasal e or o, either short or long.

(1) Stops and fricatives have both a voiced and a voiceless series of phonemes. Voiceless consonants have voiced alternants in compound words in medial stressed position under certain conditions. This means that according to underlying morphophonemic structure, voiced consonants are sometimes interpreted as variants of voiceless consonants and sometimes as phonemically voiced ones. Labial stops and fricatives tend toward spirantization when they co-occur with the feature of length and precede the high spread [i].

(a) The voiceless and voiced series of single stops occur at three points of articulation: labial, alveolar, and velar. Voiceless and voiced double stops are labiovelar.

Voiceless stops are lightly aspirated. When a short morpheme is nasalized, the aspiration has a heavy nasal quality. The voiceless stops /p, t, k/ have voiced variants which occur in unstressed syllables in word medial position. These are described under consonant variants in the basic word.

Alveolar stops are pronounced with the tip of the tongue against the alveolar ridge. Some speakers strongly palatalize the t before i when it co-occurs with length. When occurring with the secondary release feature, alveolar stops vary from prepalatal position before long vowels to palatal before short vowels; d is realized as [d] in stressed syllables and as [ř] (sometimes [d]) in unstressed syllables. The phonetic trilled r which is heard in some words is a series of two flap r's which result from the elision of the vowel i between two homorganic consonants.

Velar stops are articulated with the back of the tongue touching the velum. The k has a fronted alternant in postpalatal position before the shortest variant of the high front vowel i when the following consonant is an alveolar approximant l. This occurs in a two-syllable, long rhythm group of the CiCV/CuCV type, as for example in **kīlé** [k<ílé] 'to pull', which has two alternant pronunciations: [k<ílé] and [t>ílé].

(b) The double-articulated stops /kp/ and /gb/ are pronounced with simultaneous closure of the lips and back of the tongue against the soft palate, with noticeable suction in the oral cavity, and with a pop upon release. The release of kp and gb is realized as oral, even when combined with nasalization: **kpɔ̃** [kpɔ̃] 'Kong' (name of a town); **gbɔ̃** [gbɔ̃] 'baboon'. The nasal release occurs, however, as a distinctive characteristic when the labiovelar stops co-occur with both secondary release and nasalization:

kpmɔ̃:	[kpmɔ̃:]	'to beat'	(56)
nɩ̃-gbmɔ̃:ɔ̃	[nɩ̃gbmɔ̃ɔ̃]	'herb doctor'	

(2) Fricatives occur at two points of articulation: labial /f, v/ and alveolar /s, z/. Alveolar fricatives seem to be more prepalatal in position when they occur with the secondary release feature.

(3) Nasal consonants occur at four points of articulation: labial, alveolar, palatal, and labiovelar /m, n, ɲ, ŋ/. They contrast in word initial position with the oral consonants b, l, y, and w; everywhere else they are variants.

There is a clear contrast between m and b in word initial position; either nasalized or oral vowels may follow both b and m:

bǔ:	'thorn'	and	**mǔ:**	'to light a flame' (57)
bɛ̀:	'to agree'	and	**mɛ́ʔɛ̄**	'a name'

On the other hand, the contrast between the nasal and oral approximants n, ɲ, ŋ and l, y, and w occurs in only a few unambiguous words in which oral vowels follow both oral and nasal approximants.

lá:	'a need'	and	**naĩ**	'fire' (58)
yaʔa	'to allow'	and	**nyàa** [ɲàa]	'grass'
waʔa	'to dry'	and	**ŋãʔã**	'arrowhead'

There is no evidence of nasal vowels following oral approximants; only oral vowels have been recorded following oral consonants l, y, and w.

Proof of the interpretation of n, ɲ, and ŋ as nasal consonants rests on proof of contrast between oral and nasal vowels following them. Only one such contrast has been found following ŋ and only a few more following m, ɲ, and n. In all other words the heavily and lightly nasalized vowels following nasal consonants are in complementary distribution and do not contrast. For this reason, the nasal consonants n, ɲ, and ŋ are considered marginal phonemes.

The lightly nasalized vowels in the examples on the left below are oral vowels with nonphonemic nasalization. These words contrast with those that are heavily nasalized in the right column. Although some of these words have underlying forms which would explain the heavy or light nasalization, for others the underlying forms no longer exist. Historically there may have been no contrast between primary nasal consonants and oral consonants. This would conform to some other West African languages of which J. Le Saout says, "Each nonsyllabic nasal consonant will thus be in complementary distribution with a nonsyllabic oral consonant in initial position in the syllable" (Le Saout 1973:187). In support of this is the fact that at the present time some speakers of the same dialect differ as to heavy and light nasalization on certain words. However, on the basis of a few words, we are presently classifying lightly nasalized vowels as oral following nasal consonants.

Oral Vowels (nonphonemic, lightly nasalized)		**Nasal Vowels** (phonemic, heavily nasalized)	(59)
mɛ́:gĩ	'the name'	**mɛ́:gɛ̀lɛ̃**	'the ropes'
ñùgù	'to filter'	**nũgũ**	'to draw back-ct'
nya:	'to see'	**nyã:**	'to weep'
ŋɔnɔ	'knife'	**ŋɔ̃nɔ̃**	'a breath'

Oral and nasal variants of specific words in Tyebaara and other dialects support the historical restriction of nasal consonants to nasalized words and oral consonants to nonnasalized words:

Dialects				(60)
Tyebaara	Nãfããra	Tãgaara	Tagbãra	
yiri ~ nyĩnĩ ~ yili	**yiri**	**nyĩnĩ**	**nyĩnĩ**	go out
sibele ~ sĩmãnã	**sibele**	---	---	squat
lúgó ~ nṹgó	**lúgó**	**nṹgó**	---	move back

The consonant l has a nasal variant n which occurs in the noun suffix contiguous to a nasalized stem (phonemes are underlined):

1. **lālà**	2. **làrì-lá:lá**	but	3. **làrì-djɜ̃nà**	(61)
time	time-take-suf		time-good-suf	
'time'	'harvest'		'good time'	

The oral consonants b and l have nasalized variants [m] and [n] in medial position in basic words (see dialect examples above). However, the oral variants of b, l, y, and w occur following internal open juncture (=) in compound words and following grammatical prefinal juncture (-)in expanded words.

Expanded (62)

sjɛ̃:=bèlè 'the people' **sjɔ̃:=wà:** 'another person'

Compound

sjɛ̃:-lɛ́:ɔ́ 'maternal uncle'

In Tyebaara, the phonetic [ŋ] is a realization of /g/ in nasalized words which occurs only in rhythm unit medial position. In some other dialects, [ŋ] may be a nasal realization of /g/ or of /w/ in word medial position when they occur either initially or medially in the morpheme.

Tyebaara: **ŋɜ̃ga** [ŋɜ̃gá ~ ŋɜ̃ŋɜ̃] 'to be crooked' (63)

nɜ̃w̃ [nɜ̃w̃] 'the man' (expanded word)

nɜ̀ɔ̃̀ [nɜ̀ɔ̃̀] 'man'

Teneri: **nãw̃** [nãŋ̃] 'the man'

nãwã [nãŋã] 'man'

Tagbana: **fɔ̃bɔlɔ** [fɔ̃mɔ̃lɔ̃] 'brides'

nyɛ̃gɛ̃̀lɛ̃ [nɛ̃ŋɛ̃́lɛ̃] 'horns'

(The Tagbana data is from an unpublished study of the Katiola dialect done by Don Bothel.)

In cases of vowel reduction following nasal consonants, the nasal consonant assimilates to the point of articulation of the following contiguous consonant. This means that according to the underlying morphophonemic structure, nasal consonants are interpreted sometimes as variants of other nasal consonants and sometimes as nasal variants of oral consonants b, l, y, and w and sometimes g. In many cases, both long and short forms are currently used.

m is realized as: (64)

[n] before alveolars

mà-dɛ̀gɛ̀ [màdɛ̀gɛ̀ ~ ñdɛ̀gɛ̀] 'corn'

mĩ sa lĩ: [nsa lĩ:] 'you go eat'

[n] before velars

mì: mìgí tjɜ̃ [mì:ŋgí cɜ̃] 'I know it'

[n>] prepalatal before y
mĩ yĩrĩ mĩ yẽrẽ [mĩ yĩrĩ n>yẽrẽ] 'you stand up'
[m] before labials
mĩ ba lĩ: [mba lĩ:] 'come eat'

n is realized as:
[ŋ] before velars
nɨ̃gɔ̃-pílẽ [nɨ̃gɔ̃pílẽ ~ ŋgɔ̃pílẽ] 'small boy or girl'

ɲ is realized as:
[n] before alveolars
nyũ̃-dɔ̃̃nɔ̃ [nũdɔ̃̃nɔ̃ ~ ɲ.dɔ̃̃nɔ̃] 'hat'

(4) The approximants occur at three points of articulation: alveolar, palatal, and labiovelar /l, y, w/. While w is phonetically a labiovelar, it functions in the system as a velar. Historically the [ŋ] was probably the nasal variant of /w/. The approximants /y/ and /w/ are more consonantlike when in stressed position and in words without the feature of length, more vowellike in unstressed position and in words with the feature of length.

5.2.2 Vowels in Tyebaara play an important role in the interpretation of certain consonants and approximants as was seen in the previous sections of this chapter.

(1) Both nasal and oral vowels were established as Tyebaara phonemes in the above discussion separating nasal and oral consonants m and b and the approximants l, y, and w from their nasal counterparts n̄, ɲ, and ŋ (see charts 2 and 4).

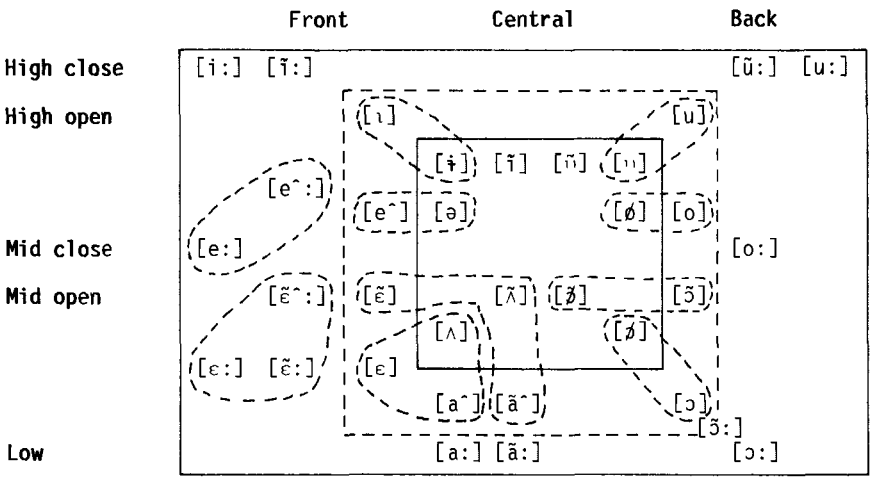
(2) Short vowels are pronounced in a central position in the mouth, with the tongue "bunched up" lengthwise. This produces a tenseness of the tongue, but not of the vocal cords.

Short vowels tend to have several variants due to assimilation to contiguous consonants or vowels. Concomitant prosodies also produce some variants, notably: length, which tends to neutralize the tenseness of the tongue in short syllables following long initial syllables, giving less centralized variants; and nasalization, which tends to heighten lower vowels and to centralize higher vowels.

(3) Long vowels, on the other hand, are articulated in a more peripheral position. The tongue seems to be lax and not advanced at the base. The prosody of secondary release causes heightened variants of some long vowels, otherwise these exhibit few quality variants.

Chart 4 shows the vowel phonemes and their variants. Vowels in the periphery in the outer square of the chart are the long oral and nasal vowels. Short vowels are in the inner squares. Variants are shown in the dotted areas in the chart. Nasalization is symbolized by ~, and length by :. The short phonetic variants [ɛ] and [ɛ̃] are variants of the phoneme a, since there is no phonetic short ɛ. It is also important to note that there is no nasal e or o in the Tyebaara dialect of Senoufo. A high nasalized variant of ɔ occurs following labial stops, and in noun suffixes following ũ.

Chart 4
VOWEL PHONEMES AND VARIANTS



5.2.3 Prosodic features are an important part of Tyebaara phonological structure. Most of these operate at the level of the word, while a few operate at higher levels.

On the level of the basic word, there are five distinctive prosodic features and three nondistinctive ones. These and three additional non-distinctive features function on the level of the compound word. On the higher levels of sentence and paragraph, there are other nondistinctive or demarcative features as noted below.

(1) There are five distinctive prosodies: tone, length, secondary release, glottalization, and nasalization. The feature of tone has five distinctive tonemes. These prosodies, together with consonants and vowels, serve to distinguish the meanings of words. Since they function at the level of the basic word, they are treated in conjunction with it in chapter 8.

(2) There are three nondistinctive prosodies: stress, rhythm, and vowel distribution. These are demarcative features which also function on the level of the basic word and are described with it. The demarcative features--tone sandhi, consonant and vowel sandhi, and internal open juncture--function on the level of the compound word with which they are described.

The demarcative features of discourse, paragraph and sentence stress, focal stress, intonation, and external juncture were described at the higher levels in chapters 1 through 4. The demarcative features of each higher level interlock with the features of the lower levels to form phonological shapes which distinguish the levels from each other, while still keeping the identity of the constituents of each level.

6 THE SYLLABLE

6.1 Syllable Structure

The syllable is the level between the word and the phoneme. It is the minimum unit of a word. It consists of a single syllable peak or nucleus which may or may not be preceded by a consonant that functions as onset. There is no coda. The nucleus may be a vowel or a syllabic consonant, and may be simple or complex. The onset also may be simple or complex. The structure of the syllable is shown in figure 1.

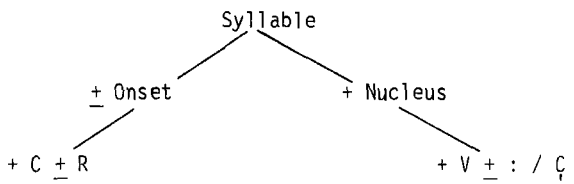


Figure 1. The Syllable

Read: A syllable consists of an optional onset filled by a consonant with optional secondary release (CR) and an obligatory nucleus filled by a vowel with optional length or by a syllabic consonant.

6.2 Syllable Tone

Every syllable carries a tone; however, tone is a prosody of the word, and the syllable tone is part of the tone of the entire word. Therefore, if a part of the syllable or an entire syllable is elided, the tone is not normally elided, but is manifested either on the remaining part of the syllable (vowel or consonant) or on the preceding syllable.

wi ñ nāː kárí (65)
[wi mí nāː mí kárí]
he cp after cp go
'He then went.'

The underlying forms of **ñ nā꞉** are **mī nā: mī.** The tone remains on the nasal consonant ñ when the syllable vowel is elided, and it is attached to the preceding syllable **nā:** when the entire syllable **mī** is elided. In compound words, the word tone may be attached to the first syllable when the other syllables are elided, or the word tone may be redistributed over both elements of the compound word.

			(66)
kologō	**kô-zī̋gé**	**ko-be?ê**	
road	road-straight	road-bad	
'road'	'straight road'	'bad road'	

The descending tone of "road" is manifested on the first syllable in "straight road," and on the entire word in "bad road".

Other prosodies such as length, nasalization, and secondary release will also be mentioned for the purpose of describing the components of the syllable structure. But it will be shown later that they are more conveniently interpreted to be distinctive features of the word.

6.3 Syllable Types

Syllable types are listed in chart 5. They are divided according to the presence or absence of a feature of length, and are listed from top to bottom in the chart in order of frequency of their occurrence.

Chart 5

SYLLABLE TYPES

Short			Long		
Type	Example		Type	Example	
CV	**fǎ**	'to run'	CV:	**fā:**	'to build'
CRV	**tjō**	'to catch'	CRV:	**tjo:**	'pick-ct'
V	**a**	particle introducing interrogative sentence	V:	**ɛ̀ɛ̄**	'yes' (response to question)
C [N]	**ñ-djo?o**	'above'	[N:]	**m̀꞉**	'yes' (response by woman to greeting)
[C]	**nǎ.w̃**	'the man'		--*	

* No syllabic long consonant occurs except the nasal consonant. Phonetically long consonants heard in word medial position result from vowel reduction and are distributed over two syllables.

In the chart and in examples that follow, the dot marks the separation of syllables; the hyphen, the separation of stressed nuclei in a compound word. In polysyllabic words, the syllable referred to is underlined.

1. **tjǎ̃.g̃.gɛ̄:** [cɑ̃g̃ːɛ̄ː] 'that day' (67)
2. **fǎ.ñ.-nā.ga** [fɑ̃ñnāga] 'loin cloth' (cloth-tail)

In example 67 number 2, the first n carries low tone and is unstressed; the second carries mid tone and is stressed.

Each of the long syllables has a subtype which is glottalized:

CV:?	**ta?a**	'to place on'	CRV:?	**fjɛ̃?ɛ̃**	'a caterpillar'(68)
V:?	**ɛ̃?e**	'no'	N:?	**m̃?m**	'no'

Hardly any significant restraint has been found on the co-occurrence of vowels and consonants in word initial syllables. The significant restrictions affecting the different consonants are conditioned by the stress factor and by the noninitial position of the syllable in the word.

Syllables of the V and Ç types are relatively rare and are restricted in variety of vowels or consonants and in distribution in the word. Syllables of the V type are limited to particles and to reduced syllables which are suffixes of a noun (page 158f.).

The long syllables V: and N: always carry stress and are limited to response particles and ejaculations: **m̃:** 'yes' (response to a question), **ɛ̃:** ejaculation.

The Ç syllable is realized as [Ç] or [Ṇ]. The [Ç] variant occurs in noninitial position and never carries stress. It results from the reduction of **i** between two homorganic consonants or in word final position. In final position the reduced syllable fluctuates with the full syllable (see example 69). In word medial position, the reduced syllable does not usually fluctuate with the full syllable, but it can be elicited. In the following examples, the syllables are separated by a dot in the semiphonemic transcription, and stress is marked by (') preceding the stressed syllable. Reduced syllables are underlined in the phonemic transcription.

'tjã̃.gĩ 'the day'	[cã̃ŋ̃ ~ cã̃gĩ]	**'sɛ̃.gĩ** 'the field'	[sɛ̃g̃ ~ sɛ̃gĩ]	(69)
'wi.mĩ 'kã.rĩ 'he has gone'	[wɨŋ̃ kãr̃]	**'a.wi 'kã.rĩ.lɛ́** 'has he gone?'	[awɨ kãr̃ĩlɛ́]	
'gɔ̃.rĩ.rɔ̃ 'cotton'	[gɔ̃r̃r̃ɔ̃]	**'gɔ̃.rĩ.rĩ** 'the cotton'	[gɔ̃r̃r̃ĩ]	
'lã̃.lĩ.mĩ nã̃ 'it is time'	[lãl̃ñnã̃ ~ lãl̃ĩñ nã̃]			

The [Ṇ] variant of the /Ç/ type syllable occurs in the initial, medial, or final position in a compound word and may or may not carry stress. It is a nasalized syllable whose vowel is reduced. The reduced vowel may be any vowel. The consonant is a variant of m, n or ŋ, and assimilates to the consonant of the following syllable. No nasal variant of w has been found as a reduced syllable. While [ŋ] occurs as a syllable, it is an assimilation of n or m to the following velar consonant. Both the long and the short forms of most reduced syllables are employed.

mà-dègè	[màdègè ~ n̲dègè]	'corn'	(70)
nǐgɔ̀-tjáríɔ	[nǐ̀gɔ̀cáríɔ ~ ŋgɔ̀cáríɔ]	'young man'	
nyǔ-dɔ̃̀lɔ̃ (nyũ-dɔ̃nɔ̃)	[ɲǔdɔ̀̃nɔ̃ ~ n̲dɔ̀̃nɔ̃]	'hat'	
pe mǐ pã	[pe m̲̀ pã ~ pe mǐ̀ pã]	'they came'	

The five tones occur on both short and long forms of all syllable types. There do not seem to be significant restrictions on tone conditioned by the segmental composition of syllables.

Part III
THE WORD

[blank]

7 DEFINITIONS AND OVERVIEW

7.1 Definitions. The **word** is the level between the phonological group and the syllable. It is a unit in which occur characteristic patterns and which is bounded by external word juncture. It consists of from one to four stressed nuclei with one optional postnuclear satellite. It constitutes the domain of consonant, vowel, and tone sandhi, and of elision. Since this entire study is on the phonology of this language, it is understood that reference is made to the phonological word unless distinction between it and the grammatical word is pertinent.

External word juncture (also referred to as "word juncture" or "open juncture") is defined as potential pause which is always followed by a stressed syllable in the following word, and which is often preceded by an unstressed short syllable in the last preceding word. The first syllable of the phonological word always has primary stress, and often coincides with the stem of a grammatical word. Although the phonological word often corresponds to the grammatical word, it may also extend across grammatical word boundaries.

The **nucleus** of the word is defined as one to four rhythm units with stress on the first syllable. It is the domain of prosodic features which may extend over the nucleus or over the entire word. The nucleus may consist of from one to three syllables. It is preceded by external word juncture or by internal open juncture (page 173) and is followed by external word juncture, internal open juncture, or prefinal juncture (page 121).

The **satellite** is defined as consisting of from one to two syllables which are preceded by prefinal juncture and are followed by external word juncture. It is subordinate to the nucleus to which it is attached. This is manifested by the fact that it tends to vary in tone pattern according to the tone pattern of the nucleus to which it is attached (page 169). It does not have separate stress.

The **structure** of the word is shown in figure 2.

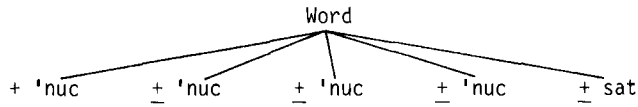


Figure 2. The Word

Read: A word consists of an obligatory nucleus followed by three optional nuclei, all carrying stress on the first syllable, and may be terminated by an optional postnuclear satellite which is unstressed.

7.2 Types of words in Tyebaara are discussed in detail in chapters 8 and 9. They are:

(1) the **basic word**, which has a single tone placement and limited vowel and consonant sequences, has only one stressed nucleus and an optional, unstressed postnuclear satellite;

(2) the **complex word**, manifesting two subtypes:

* the **expanded word**, which has complex tone, consonant and vowel sequences and added syllables, has only one stressed nucleus and an optional postnuclear satellite which is unstressed;

* the **compound word**, which has more than one nucleus--each of which has primary stress--may be terminated by an optional postnuclear satellite which is unstressed.

Chart 6

THE NOUN AND THE NOUN PHRASE

PHONOLOGICAL	+nuc	±sat	+nuc	±sat	+nuc	±sat	+nuc	±sat
Noun								
basic	X	X						
expanded	X	X						
compound	X		X		X		X	X
Noun Phrase	X	X	X	X	X	X	X	X
GRAMMATICAL	+st±suf/	suf	+st±suf/	suf	+st±suf/	suf	+st±suf/	suf
Main Form Cl	n/v 1/2 /pro	1-5	n/v 1/2	1-3	n/v 1	1/3	n/v 1	1/3

Read: Each noun consists of one or more stems plus an optional suffix which may be part of the nucleus or may comprise the satellite. The first phonological nucleus is realized on the grammatical level as a stem (generally a noun, verb, or pronoun) plus an optional suffix of subtype 1 or 2. The satellite following the first nucleus may consist of any of five suffix subtypes. The second, third, and fourth nuclei are realized as stems of predominantly nouns or verbs plus optional suffixes of subtype 1 or 2 in the second nucleus, or subtype 1 in the third or fourth nucleus. The satellite following the second nucleus may be realized as a suffix of subtype 1, 2, or 3, and those following the third and fourth nuclei as suffix subtypes 1 or 3.

7.3 The word versus the phrase. It will be helpful here to give a brief comparison of the grammatical structures of the word and of the phrase, and to compare the grammatical with the phonological components.

(1) The noun and the noun phrase are differentiated by the number and placement of the noun suffixes: basic and complex nouns are limited to one noun suffix which occurs in final position, whereas the noun phrase has several noun suffixes occurring in medial and final position following each noun stem of the phrase. (In this section, the equal sign symbolizes grammatical juncture preceding suffixes.)

Compound noun	Noun phrase	(71)
tjɛ̃-kolo=gɔ̃	**tjɛ́nɛ́=gĩ kɔ́lɔ́=gɔ́**	
market-road=suf 1	market=the (suf 2) road=suf 1	
'market row'	'market road'	

In chart 6, the noun and the noun phrase are contrasted as to phonological and grammatical components. The phonological part of the chart is self-explanatory; therefore, "read" applies only to the grammar and form class lines. Restrictions pertaining to the grammatical components are detailed in the following paragraphs.

In disyllabic words, the grammatical suffix may be either part of the phonological nucleus or may comprise the phonological satellite, but there are not two suffixes in a basic word. Each simple noun has a singular concord suffix of the indefinite subtype. This consists of one CV syllable, except for some **wii**-class nouns, which have a V syllable or a zero suffix.

Chart 7

NOUN SEMANTIC CLASSES
(named after class identifiers)

	wii	**gii**	**lii**	**dii**	**bii**
1.	living beings	large objects	small objects	collective	mass
	sjɔ̃: 'person'	**kà=ʔà** 'village'	**kɔ̀=lɔ̀** 'stool'	**sjɛ̃:=rɛ** 'words'	**sjɛ̃:=mɛ̃** 'crowd'
	nɛ̀-mà: 'mosquitoes'	**nɛ̀-mà=ʔà** 'large mosquito'	**nɛ̀-mà:=nã** 'small mosquito'	**nɛ̀-mà:=rà** 'swarm of mosquitoes'	**solo=mɔ̃** 'salt'
2.	borrowed words collective	diminished value, events	one of collection, action		abstract object
	fànì 'cloth'	**fànì-lɛ́=ʔɛ́** 'old cloth'	**wálí-pí=lé** '5 francs'	**kpà:=rà** 'cowries'	**sĩ-tjìlì=mɛ̀** 'intelligence'
	wálí 'money'	**ŋɰ̃nɔ̃=gɔ̃** 'dream'	**djo:=lo** 'speech'	**sĩ:=re** 'feathers'	**ŋɰ̃nɔ̃=mɔ̃** 'sleep'

Nouns are grouped according to semantic classes with semantic connotations as shown in chart 7. The suffix is preceded by the equal sign in the examples. The **wii**-class examples have zero suffixes.

Suffix subtypes are: (1) indefinite (CV), (2) definite ('Cĩ), partitive (CCã:), (4) demonstrative ('CCẽ:), (5) interrogative (CCĩ:). The

consonants are homorganic with the consonant of the class identifier: **ti:=ge gi:** 'it is a tree', **tī:=ggē:** 'that tree'. The suffix vowel of subtype 1 harmonizes with the predominant vowel of the contiguous stem (page 156). All subtypes have plural forms that vary according to class.

Complex nouns (expanded and compound) may be realized with singular or plural forms of any of the five subtypes of suffixes. These occur always in final position.

In the noun phrase, the suffix of the initial noun may be realized as any one of five subtypes. However, succeeding nouns are restricted to subtypes 1 (indefinite) or 3 (limitative). The one exception to this is: when the initial nucleus of the phrase is a possessive adjective consisting of a proper name or a pronoun, the suffix of the following noun may be realized as 1 (indefinite), 3 (limitative), or 2 (definite). When the grammatical suffix is part of the phonological nucleus, it can only be 1 (indefinite) or 2 (definite) in the singular forms, as other suffix subtypes occur only following prefinal junctures and thus are realized as phonological satellites.

The noun stem is normally comprised of either a noun or a verb or a combination of both, but it may be comprised of a prefix, pronoun, or an embedded combination of forms (page 198).

The noun phrase may be comprised of either all nouns, or nouns or pronouns combined with adjectives.

1. **mĩ: nã̌=w̃ tjɔ̃nɔ̃=ɔ̃̀ pjà** (72)
   my man-the young-brother-suf 1 child
   'the child of my husband's younger brother'

2. **sjɛ̃́:=bèlè bɛ́: pèlè**
   person=pl-suf 2-the there some
   'some of these people'

(2) The compound verb and the verb phrase are also differentiated by the number and placement of verbal particles, only one of which may occur in a compound verb, whereas in a verb phrase all verb stems are preceded by verbal particles.

Chart 8

THE VERB AND THE VERB PHRASE

Phonological Units		±sat		+nuc	±sat		±sat		+nuc	±sat		±sat		+nuc	±sat
Verb															
basic	+			X	X										
compound	+			X	X	+			X	X					
Verb Phrase	+	X		X	X	±	X		X	X	±			X	X
Grammatical Units		±pt	±pt	+st	±suf		±pt	±pt	+st	±suf		±pt	±pt	+st	±suf
Form Class		TAM-1	pro	v	1-3		TA-2	pro	v	1-3		TA-2	pro	v	1-3

The verb phrase may comprise up to four verbs, but the compound verb may comprise only two verbs. The verb may include only a verb stem, or else it may require a particle, a suffix, or both. Particles and verb stems are often separated by objects. Only one object occurs in each verb phrase, but it may occur preceding a verb in any position. Verb particles are often attached phonologically to the words preceding them but not to the verb they modify (page 164). Each particle signifies tense, aspect, and mode. They have two distribution classes: (1) all markers of tense, aspect, and mode (TAM) occurring in clause initial position; (2) (TA) markers in clause medial position (present-past tense: completive aspect ñ, continuative aspect ni), and future tense: completive aspect, high tone or zero, and continuative aspect ra.

The basic form of the verb, the completive form, is most often employed in both compound verbs and compound nouns. Most verbs have two forms: completive and continuative. Completive verbs must follow a completive aspect particle, and continuative verbs a continuative aspect particle.

completive		continuative		(73)
wi ñ gĩ fã: [wɨŋ̃gɨ̃ fã:]		**wi i gi fã:ri** [wi:gi fã:ɾɪ]	
cp cp v		ct v=suf	
'he built it'		'he is building it'	

The verb suffix is always phonologically attached to the preceding verb stem. Most suffixes are phonological satellites. However, sometimes the suffix replaces part of the verb stem and is phonologically part of the nucleus. Three subtypes of verb suffixes occur: transitive, plural, continuative aspect.

1. **kàrĩ=gà**	2. **ta?a=la**	3. **tjã̆=gĩ**	(74)
turn-tr suf	to place-pl suf	know-ct suf	
'turn'	'to stack'	'knowing'	

The verb phrase nucleus may be comprised of a verb only or of a verb plus auxiliaries. Auxiliaries do not have suffixes. The particles occurring between stems in the verb phrase are restricted to tense and aspect, class 2. Class TAM-1 occurs only initially in the clause. These particles may be elided between auxiliaries, or they may combine with the preceding particle, becoming part of the same nucleus. However, particles are not elided between verbs, except occasionally in the future tense. The following examples compare the verb and the verb phrase.

basic verb		compound verb	(75.1-4)
1. **kõlõ**	**kõlõ=gõ**	2. **kpàrà-tjõ**	
	roll-suf 1	encircle-catch hold	
'to be steep'	'roll' (tr)	'to pardon'	

verb phrase		verb phrase
3. **màa gĩ lõ?õ ñ djo: ñ kwõ:**		4. **ñ ná: ba=à gĩ pje**
rem p it hear cp say cp finish		cp after come-cp it do
TAM-1 ob v TA-2 v TA-2 v		TA-1 av pt aux-TA-2 ob v
'had already interpreted it'		'has then come and done it'

A compound word may include an embedded clause from which the extraneous particles are eliminated.

1. compound: nuc nuc nuc sat (76.1-4)
sjɛ̃:-fɔrɔ-gwɔ́:=bɛ̀lɛ̀
'the already tired people'

2. clause: nuc sat sat nuc sat nuc
sjɛ̃:=bɛ̀lɛ̀ ǹ fɔ̀rɔ̀ ǹ kwɔ́:
person-pl-the cp tire cp finish
n-suf 2 TAM-1 v TA-2 v
'The people are already tired.'

3. compound: nuc nuc nuc
gàrɽ̀-mà-nɔ̃:
'mid June to mid July'

4. phrase: nuc nuc nuc sat nuc
kâri mɔ nɔ̃́:=w (má)
go your mother-the (to)
verb pro n-suf (pp)
'Go to your mother.'

Compound words manifest tone sandhi, giving the word an acceptable compound word tone pattern (page 181). Also, in number 1 above, another cohesive feature of compound words occurs, that of consonant assimilation (page 175), in which **kwɔ́:** becomes **gwɔ́:**.

8 THE BASIC WORD

The basic word is the domain of limited rhythm, tone, vowel, and consonant patterns. It consists of one stressed nucleus comprising one or two syllables and an optional post nuclear satellite of one unstressed syllable. The entire word may contain no more than three syllables.

The basic word is the level at which most of the prosodic features are best described. These occur only once in the basic word, and act either as cohesive nonphonemic features or as phonemic features. The basic word will be described first as to structure and secondly as to prosodic features.

8.1 The structure of the basic word is shown in the following figure.

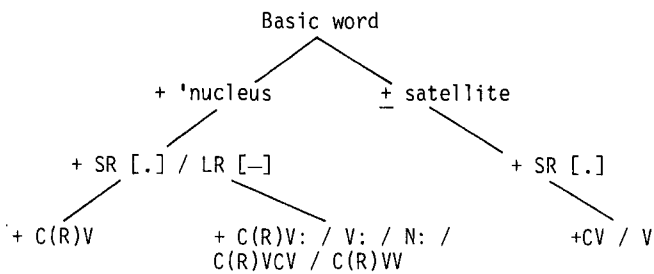


Figure 3. The Basic Word

Read: The basic word consists of an obligatory nuclear slot which may be filled by either a short rhythm unit of the CV or CRV syllable type or by a monosyllabic long rhythm unit of the CV:, CRV:, V:, or N: syllable type or by a long rhythm unit of two short syllables of the CVCV, CRVCV, CVV, or CRVV types. The word may be terminated by an optional satellite which is a short rhythm unit of the CV or V syllable type. The nucleus has primary stress, and the satellite has no stress.

The basic word may be divided into two subtypes: the nucleus and the nucleus-satellite.

(1) The nucleus subtype of the basic word consists of a nucleus only. It may have a short word rhythm or a long word rhythm.

(a) Words of the short word rhythm are realized as one short syllable of one of the following two patterns:

Word Rhythm	Structure	Examples		(77)
Short [.]	CV	**sĩ́**	'to be straight'	
	CRV	**tjã́**	'to know'	

(b) Words of the long word rhythm are realized as one long syllable or two short syllables without intervening juncture. They are realized according to the following patterns:

Word Rhythm	Structure	Examples		(78)
Long [—]	CV:	**sĩ:**	'two'	
	CRV:	**tjã́:**	'cause to fall'	
	*CVCV	**sige**	'wait'	
	*CRVCV	**tjàlà**	'tremble'	
	**CVV	**nã̀ɔ̃**	'man'	
	**CRVV	**ṣãbã-tjã́ɔ̃**	'a literate'	
	V:	**ɛ̃̄ɛ̃**	'yes'	
	N:	**m̃:**	'yes'; also an acknowledgement by a woman to a greeting	

* The long word rhythm of the C(R)VCV structure has subtypes patterning as C(R)VCV where $V_1 = V_2$, as C(R)iCV/C(R)uCV, and as C(R)VCi (page 123).

** The CVV and CRVV types are limited to the basic form of nouns of the semantic class **wii** (see chart 7).

The most frequent form of the long nucleus type of words is the CVCV form. The least frequent forms are the V: and N: which are limited to response particles or interjections.

(2) The nucleus-satellite subtype of the basic word consists of a nucleus and a postnuclear satellite. It has two word rhythms: short-short, symbolized as (..), and long-short, symbolized as (—.). The first part of each pattern is the nucleus, and the second is the satellite. In the basic word, the satellite is always one short syllable. The satellite and nucleus are separated by a prefinal juncture (page 121).

(a) Words of the short-short word rhythm consist of a syllable structure of C(R)VCV. Prefinal juncture separates the two syllables, causing a slight lengthening of the vowel of the first syllable (page 128). This results in a different vowel variant in some words and also in different consonant variants in the final syllable of some words. Disyllabic words of the short-short word rhythm often correspond to derived words, which are formed by the addition of a suffix.

				(79)
nã̀ɔ̃̀	'man'	**nã̀=nà**	'man of small stature'	
sĩ́	'to be straight'	**sĩ́=nɛ̃**	'straightness'	
		sĩ́=gĩ	'becoming straight'	

The examples of disyllabic words, given in semiphonemic transcription followed by phonetic, show the phonetic contrast between the vowels in the words having the long word rhythm and those with the short-short word rhythm (prefinal juncture is marked =).

Word Rhythm		Structure	Examples			(80)
short-short	[..]	CV=CV	**wo=lo**	[woˆloˆ]	'action of pouring'	
long	[–]	CVCV	**wǭlō**	[wǭlǭ]	'we'	
short-short	[..]	CV=CV	**kã̄=ŋã**	[kã̄ˆŋãˆ]	'writing' (n)	
long	[–]	CVCV	**kã́nã́**	[kɛ̃́nɛ̃́]	'circumcise'	
short-short	[..]	CRV=CV	**se-tjo=ro**	[sẽcōˆr̃ōˆ]	'clearing a new	
long	[–]	CRVCV	**tjõrõ**	[cǫ̃r̃ǫ̃]	'count' / field' (n)	

In the disyllabic long word rhythm, vowels tend to be more centralized and to assimilate to both preceding and following contiguous consonants or vowels. In the short-short word rhythm, on the other hand, vowels are slightly less centralized and assimilate only to the preceding consonant (page 133).

(b) Words of the long-short word rhythm consist of one long syllable and one short syllable, or of three short syllables. In each type, prefinal juncture is manifested before the final syllable as shown in the following:

Word Rhythm	Structure	Examples			(81)
long-short [–.]	CV: =CV	**mĩ:ˌwǒ:=lo**	[mĩ:ˌwòolo]	'mine'	
	CVCV =CV	**kã́nã́=nã**	[kɛ̃́nɛ́nɛ̃]	'circumcision'	
	CRV: =CV	**kwɔ̃:=mɔ̃**	[kwɔ̃:mɔ̃]	'end'	
	CRVCV:CV	**tjõlõ=gõ**	[cǫ̃l̃ǫ̃gǫ̃]	'be healthy'	
	CV: =V	**nã̄:=ɔ̃**	[nã̄:ɔ̃]	'scorpion'	
	CVCV =V	**dĩrĩ=õ**	[dĩrĩò]	'large black ant'	
	CRVCV=V	**tjĩrĩ=o**	[cĩrĩō]	'orphan'	

Notice that the syllable structure is limited to CV or V in other than the first syllable. The most common type of syllable structure of the long-short word rhythm is CVCV=CV.

8.2 Prosodic features of the basic word are best described at this level since they occur only once in a word and serve to distinguish meaning or to act as a cohesive factor within the word. These features are associated with the stressed nucleus of the word. Some of them extend over the whole word; others extend over the nucleus and may have some effect on the satellite or on the second nucleus when the word is a compound. These details will be described under the individual features.

Five of these prosodic features are distinctive since their presence distinguishes meanings of words. They are: tone, length, secondary release, glottalization, and nasalization.

Three prosodic features are demarcative since they act as cohesive factors within the word. They are: stress, rhythm, and vowel distribution. Juncture may be considered a fourth feature, but it is described under rhythm, with which it is closely associated.

The prosodies will be described in the following order: (1) tone, (2) stress, (3) rhythm, (4) length, (5) secondary release, (6) glottalization, (7) nasalization, (8) vowel distribution.

8.2.1 Tone is a distinctive feature of the basic word because it spreads over the entire word and serves to distinguish meaning. There are no more tone patterns at the level of the basic word than at the level of the syllable. This means that the tones of the syllables do not combine to give added tone patterns at the word level. The same tone patterns are found on the syllable level and on the basic word level. Any additional tone patterns which occur are those belonging to the expanded word, to the compound word, or to a borrowed word.

Borrowed words whose tones and consonant or vowel sequences differ from those of Senoufo basic words are either changed to acceptable vowel and consonant sequences and tone patterns, or they are treated like compound words. For example, the French word "tomate" becomes **tàma-tí:** in Senoufo. The vowel sequence of the first part is changed to fit the basic word vowel sequence (page 156), and internal open juncture is added preceding the final consonant, since it occurs in Senoufo only after open juncture (page 173). The word is pronounced like a compound word.

(1) Five tonemes spread over the basic word: high /ˊ/, mid /-/, low /ˋ/, descending /ˆ/, and rising /ˇ/. The range between the tones is wide. Welmers described the difference between the high and the low tones in Senari (Tyebaara) as a musical fifth (Welmers 1950:127). The mid tone is closer to low than it is to high. The three level tones could be compared with each other by representing them as low - 1, mid - 2, high - 5. The width of intervals between tones is less for some speakers than for others. (In phonemic transcriptions, mid tone is not written in this work.)

Sentence intonation and paragraph intonation affect the levels of tones within the sentence or within the paragraph. The high tone at the beginning of a sentence may be higher than the high tone at the end of the sentence, depending on the type of sentence intonation. But as the intonation descends, all the levels of the tones become lower so that high, mid, and low are still in the same relationship to each other. Also, paragraph focal stress affects the width of the range of intervals between tones. In this case, high tones may become higher while low tones become lower.

The descending tone /ˆ/ begins on mid and ends on low. A sequence of high and low tones occurs on the expanded word and on the compound word, but not on the basic word (page 160). In this study, tone is marked over each syllable so that the differences between mid low in a basic word and high low in an expanded word are clearly seen, since they often occur on words of more than one syllable.

(2) Distribution of allotones. Chart 9 shows the occurrence of the five tones and their variants on monosyllabic, disyllabic, and trisyllabic basic words.

Chart 9

TONE DISTRIBUTION IN BASIC WORDS

Tone	Monosyllabic C(R)V(:)	Disyllabic C(R)V(:)CV	Trisyllabic C(R)VCVCV	Tone Label
High /˝/				
[˝]	˝	˝ ˝	˝ ˝ ˝	H
*[˝ ˝]		˝ ˝	˝ ˝ ˝	
Mid /¯/				
[¯]	¯	¯ ¯	¯ ¯ ¯	M
Low /˘/				
[˘]	˘	˘ ˘	˘ ˘ ˘	L
Descending /ˆ/				
[˘˝]	ˆ	˘ ˝	˘ ˘ ˝	D
Rising /ˇ/				
[ˇ]	ˇ	ˇ ˝	ˇ ˝ ˝	R
** [ˇ ˝]		ˇ ˝		
** [ˇ ˝ ˝]			ˇ ˝ ˝	

* Allotones [˝] and [˝ ¯] are features of the grammatical class of nouns. The final mid tone following high or rising tones occurs only on noun suffixes, on some noun stems, and on adjective stems. This could be extended to noun phrases, as some adjectives bear the high mid allotone. The final mid allotone is not written in this study except when it is pertinent.

** Allotones low-high followed by mid [ˇ-] and low-mid followed by mid [ˇ ¯ ¯] occur only in nouns which are realized with suffixes: the former when the stem is monosyllabic, and the latter when it is disyllabic. Elsewhere, the glide rises to high tone on the final syllable.

(3) Limitations of distribution. A survey of the grammatical word classes evidenced limitation in tonal shapes in some classes in contrast to less limitation in others. The two largest classes of words, the nouns and verbs, can often be distinguished from each other in a sentence by recognizing that the verbs are limited to level tones and one variant of rising tone, while the nouns may have any of the five tones. Chart 11 shows the distribution of tones in the major grammatical classes.

Chart 10

EXAMPLES OF TONE DISTRIBUTION IN BASIC WORDS

Tone	Monosyllabic	Disyllabic	Trisyllabic
High	sí 'then' kō: 'draw water' nā: 'here'	sḯgí 'becoming straight' kólɔ 'green monkey' nā́:ɔ̄ 'scorpion'	sḯnā́gá 'make lie down' kólógó 'insufficient' kólómɔ 'knocking' lāʔálá 'peel, take off'
Mid	sī: 'two' kɔ̄ 'to store' nā 'arrive'	sige 'to wait' kɔlɔ 'to cough' nāga 'tail'	sigele 'waiting' (n.) kologo 'make turn' labala 'be stupid'
Low	sì: 'life' kù: 'to die' là: 'another'	sì̀mà̀ 'oil' kɔ̀:nɔ̀ 'grave' nà̀gà 'man of big build'	sìgàlà 'ginger root' kòlògò 'to roll' làbàlà 'bow, bend'
Descending	bê: 'there' kô: 'wood cover' nâ: 'fire'	sīmà̀ 'beer' kɔlɔ̄ 'hand' ŋaʔà 'arrow'	zīnīɔ̄ 'lice' kologò 'road' laʔalà 'boundary'
Rising	zǐ̌ 'anyway' bǔ̌: 'black berry' nǎ̌: 'mama' gǐ̌: 'which one'	sì̀nǎ̌ 'even so' kɔ̀lɔ̄ 'well' ŋǎ̌ɔ̄ 'twin' gǎ̌nā 'tooth'	nyì̀mì̀nǐ́ 'squeezing' kòlògī 'rolling' làbàlá 'bowing' lɔ̀rigɔ 'yam'

Chart 11

DISTRIBUTION OF TONES IN GRAMMATICAL WORD CLASSES OF BASIC WORDS

Tone	n	aj	av	v	TAM	aux	pro	conj	pt
H [ˊ]	x	x	x	x	x	x		x	x
[ˊˉ]	x	x							
M [ˉ]	x	x	x	x	x	x	x		x
L [ˋ]	x	x	x	x	x	x	x	x	x
D [ˆ]	x		x				x		x
R [ˇ]	x		x	x		x	x		
[ˇˉ]	x								
[ˋˉ]	x								

All tones are manifested on nouns and adverbs. Verbs are restricted to level tones in the basic verb forms, but rising tones occur in some derived continuative verb forms. Glides are restricted in some word classes, but they are important in nouns, adverbs, pronouns, and auxiliaries.

8.2.2 Stress is a demarcative, nondistinctive feature serving as a cohesive factor within the word and occurring once in each basic word. It is realized as a long and fortis articulation of the onset consonant of the stressed syllable, and as an intense articulation of that syllable. For example, the following measurement was made of the words **'lālā** [lālā] 'time', and **'li:** [lī:] 'it is'.

	l	**ā**	**l**	**ā**	**l**	**i:**		(82)
centiseconds:	14	8	4	8	10	14		
	4	2	2	2				

The numbers on the first line under the word indicate the duration in centiseconds of each segment, while the second line of numbers indicates the approximate length of transition from one segment to the next. Notice that the duration of the two stressed l's is 14 and 10 centiseconds respectively, and that the duration of the unstressed medial l is 4 centiseconds. The fortis variants of consonants which occur in stressed position are listed under the feature of rhythm (page 128).

Although the consonant is longer in stressed syllables than in unstressed ones, vowels are not lengthened because of word stress. Word stress is different from sentence initial stress and focal stress. The latter are realized as loudness, wide intervals between tones, high intonation, and sometimes also as extra duration of words.

Stress always occurs on the first syllable of the basic word. Closely associated with it are the features of length, secondary release, and long rhythm units, which all occur only word initially in the basic word.

Stress always follows open juncture: either external word juncture or internal open juncture (page 173). Any word containing more than one stressed syllable is a compound word, and internal open juncture precedes the medial stressed syllable.

The following examples are transcribed semiphonemically, then phonetically, showing the phonological differences between stressed and unstressed consonants. In the phonetic transcriptions, the consonants are marked as follows: fortis C, weak C, weakest C.

[d ~ ř]	1. **'kà-'dàdàgà**	[kàdàřàgà]	'spot on the skin'	(83)
[b ~ β]	2. **'tàbà-'tɔ̃:lɔ**	[taβàtɔ̃lɔ]	'pipe'	
	3. **'tā-'bā:**	[tābā:]	'lance'	
[m ~ n]	4. **'nũmɔ̃nɔ̃**	[nⁿmɔ̃nɔ̃]	'smelling' (n)	
	5. **'nī-'mã:nã**	[nɨ'mã:nã]	'mosquito'	

In contrast to the longer, more fortis variant in the stressed syllable, the unstressed consonants are lightly articulated: in unstressed syllables, /d/ is realized as [ř], /b/ as fricative [β], and /n/ and /m/ as quickly and lightly articulated. Other variants are given under Rhythm unit (page 128f.).

Stress may move from one particle to another when that particle is changed from initial position to medial position in a word. In the following examples, stress is marked in the transcription on the left.

ta ct	**'ta 'ma:** ~ **'da 'ma:**	[t̪ā m̪ā: ~ d̪ā m̪ā:]	'come'	(84)
	'wa:=da 'ma:	[w̪ā:řā m̪ā:]	'he'll be coming'	
gā emph	**'wi 'gá 'pāí**	[w̪ɨ́ g̪á pāí]	'he did not come'	
	'wi 'sígá 'pāí	[w̪ɨ́ s̪íg̪á pāí ~ w̪ɨ́ s̪íɣ̪á pāí]	'but he didn't come'	

Both particles are unstressed when they do not occur word initially, but they are stressed when they do occur there.

8.2.3 Rhythm, with which juncture is closely associated, is a demarcative feature of the basic word. It serves as a cohesive force within the word. Each basic word is realized as only one rhythm pattern.

The feature of rhythm is defined as the method of joining syllables to form words, which may result in a syncopated beat, a short regular beat, or a lengthened regular beat. These beats are called word rhythms in this study, and the components of the rhythms are called minimal rhythm units.

Each word rhythm carries primary stress on the initial syllable and is bounded by open juncture. The minimal rhythm units are: the short rhythm unit to which we give the symbol (.), and the long rhythm unit, to which we give the symbol (—). The structure of the rhythm units will be described below.

Prefinal semiopen juncture and length combine with syllables to form rhythm units and word rhythms. Prefinal juncture is written with the equal sign in this material.

In addition to the rhythms of basic words, rhythm groups exist at higher levels (sect. 4.2). These may cause the syllables to compress or spread to fit the larger rhythm pattern while maintaining the overall inherent rhythms of the words. Also, sentence focus and paragraph focus may cause nonphonemic length on one or more words. Example 85 shows sentence focus on the verb. Although the long rhythm of **fàrà** would normally be shorter than the long-short rhythm of [mī:ñwī] in this case it is actually longer. However, even though the entire word **fàrà** is lengthened, because the second vowel is almost a third longer than the first one (page 127), the overall inherent rhythm of the long disyllabic pattern is maintained as shown:

mī: ñ wɨ́ fàrà	[mī:ñwɨ́ fàřà]	'I met him.'	**f**	**à**	**r**	**à**	'met'	(85)
centiseconds:	27	49	22	10	4	13	
word rhythm:	(—.)	(—)						

Chart 12

CHARACTERISTICS OF PREFINAL JUNCTURE IN RELATION TO OPEN AND CLOSED JUNCTURE

Preceding vowel	Type of juncture	Following consonant
V-1 extra long V-2 short	prefinal semiopen	C_2, lenis, short, unstressed
V-1 long V-2 medium-short	open juncture	C_1, fortis, long, stressed
V-3 extra short	closed juncture	C_3, extra lenis or fricative, extra short, unstressed

(1) Prefinal semiopen juncture is the transition between two minimal rhythm units. The transition is realized as the occurrence of:

(a) nonphonemic length on the consonants and vowels contiguous to it,

(b) V_2 quality vowel variants (page 132f.) preceding it,

(c) C_2 quality consonant variants (page 128ff.) following it,

(d) the rising tone preceding it in a noun bearing rising tone.

Prefinal semiopen juncture differs from open juncture by the fact that stress never occurs on the syllable following prefinal juncture, while it does occur on the syllable following open juncture. Other differences between the prefinal semiopen juncture, open juncture, and closed juncture are shown above in chart 12.

closed juncture	prefinal semiopen juncture	open juncture (86)
fã́nã́ [fʌ̃́ŋʌ̃́] 'wither'	**fã̀=nã̀** [fʌ̃̄ŋʌ̃̄] 'running' (n)	**fã̀** [fã̀ˆ.] 'to run'
yala [yɛ̄lɛ̄] 'be right'	**ya=la** [yāˆlāˆ] 'thing'*	**nã** [ŋãˆ.] 'to arrive'
kɔ̃lɔ̃ [kɔ̃lɔ̃] 'a well'	**gã̌=nã** [gã̌ˆŋã̄ˆ] 'tooth'	**ŋã̌-nã** [ŋã̌.ŋã̀ˆ.] 'twin boy'

Prefinal juncture occurs in the following instances:

* as a semiopen transition following a monosyllabic or disyllabic long rhythm unit in a long-short word rhythm (—=.),
* as the grammatical juncture in a short-short word rhythm (.=.),
* as a combination of the semiopen transition and the grammatical juncture following a monosyllabic long rhythm unit in a long-short word rhythm (—=.).

A comparison of these occurrences of prefinal juncture with closed juncture is given in example 87. The duration (in centiseconds) of seg-

ments preceding and following juncture is indicated below each of the words being compared. (The data is from oscillograms made by McKinney in which length of the initial consonants was not noted.) When grammatical juncture is combined with semiopen transition, the vowels and consonants contiguous to the juncture are longer than when semiopen juncture alone is present.

1	2	3	4 (87)
closed (–)	**semiopen + grammatical** (.=.)	**semiopen** (—=.)	**semiopen - grammatical** (—=.)
f̃ãnã [fʌ̃nʌ̃]	**fã=nã** [fʌ̃nʌ̃]	**fã:=nã** [fã:nã]	**fã:=nã** [fã:.nã]
f ã n ã	f ã n ã	f ã: n a	f ã: n ã
c/s: 6 5+ 9	8 6 7	18 8 8	22 9 6
'to wither'	'act of running'	'to deceive'	'act of building'

A comparison of numbers 1 and 2 in example 87 shows the addition of length to the medial vowel and consonant in number 2 where semiopen juncture occurs. When there is no juncture, number 1, the first three segments are shortened and the final vowel is a third longer than the initial vowel. A comparison of numbers 3 and 4 shows that there is added length on the vowel and consonant contiguous to the prefinal and grammatical juncture in number 4.

The prefinal semiopen juncture may be moved in a word when that word becomes part of an expanded word by the addition of a syllable which then becomes a satellite. The juncture always precedes the satellite. Therefore, the prefinal juncture is not phonemic.

tjõlõ=gõ [çøløgø] 'to be healthy' (88)

tjõlõgõ=mɔ̃ [çøløgømɔ̃] 'health'

(2) The structure of word rhythms reveals that basic words contain one or two minimal rhythm units.

Rhythm units. The two minimal rhythm units are realized as the following syllable structure:

(a) The short rhythm unit is realized as one syllable which bears stress only when it is in initial position in the word rhythm. It may be the only rhythm unit in a word: **kã** (.) 'to boil'. Or it may combine with another rhythm unit in either initial or final position. Semiopen juncture separates the rhythm units: **kã=nã** (.=.) 'writing', **sãmã=gá** (—=.) 'to arrange'.

The syllable types of the short rhythm unit are:

C(R)V	**tjõ**	(.)	'to hold'	**nã=gà**	(.=.)	'large man'	(89)
V	**ã**	(.)	'and then'				

The short rhythm unit is longer when it occurs in a monosyllabic word than when it occurs in a polysyllabic one (see chart 16).

(b) The long rhythm unit is realized as a long unit with stress on the initial syllable. It may consist of two syllables with syncopated rhythm or one syllable with the feature of length.

The long rhythm unit is bounded by open junctures when it is the only rhythm unit in the word: **kālā** 'to fry'. It is preceded by open juncture and followed by semiopen juncture when it occurs in combination with another rhythm unit: **kālā=gī** 'to ruin'. In the basic word, it always occurs in initial position, but in complex words it may occur in final position in the expanded subtype (page 162) or in medial or final position in the compound subtype (page 170).

(c) The disyllabic long rhythm unit is realized as two subtypes, each of which again divides into two subtypes. In chart 13, the vowel durations are relative durations of short vowels within each word.

Chart 13

SUBTYPES OF THE DISYLLABIC SYNCOPATED LONG RHYTHM UNIT

Subtypes	1a C(R)VCV	1b C(R)i/uCV	2a C(R)VCi	2b C(R)VV
Vowels	V_1 = V_2	V_1 = i V_2 = spread V V_1 = u V_2 = rounded V	V_1 = any V V_2 = i	V_1 = any V V_2 = ɔ/o
Vowel durations:	shorter-longer	shorter-longer	longer-shorter	longer-shorter
Examples:	**kālā** 'to fry' **kōlō** 'chair'	**kīlē** 'to pull' **kūlō** 'foreign country'	**kārī** 'to go' **koli** 'to gather'	**nɜ̄ɜ̄** 'man'

In subtype 1a, V_1 is shorter than V_2 (page 126), resulting in a syncopated beat of 1-2.

In subtype 1b, V_1 is shorter than V_2 due to the syncopated beat of 1-2 and the high close vowels in V_1 position which are shorter than lower vowels. When the second consonant is an l or r̆ and the initial consonant is a stop consonant, the very short high close vowel is heard as a transition which is indistinguishable as spread or rounded. It is, however, predictable as spread preceding the second spread vowel or as rounded preceding the second rounded vowel. It is easily heard in other forms of the word when the second syllable is replaced by a juncture and another syllable, as in the following examples. In compound words, internal open juncture is marked by a hyphen, and in expanded words, prefinal semiopen juncture is marked by the equal sign. The C(R)iCV/C(R)uCV subtype of the long rhythm group is interpreted as two syllables rather than as one syllable having an initial consonant cluster (CCV)

basic word	expanded word	compound word	(90)
kūlō [k.ŭlò.] 'foreign country'	**kŭ=lī** [k.ŭ.l̀. ~ k.ŭ.lī] 'the foreign country'	**kŭ-lé:lī=lē** [k.ŭ.l.é:līlē] 'a far foreign country'	
pīlē [p.īlē.] 'a soul'	**pī:=gèlē** [p.ī:gə̀lə̄] 'the souls'	**pī:-lībē=lē** [p.ī:l.ɨbə̄.lə̄] 'a worthy soul' (soul-heavy)	

because of the morphology, and because there may be different tones on the two syllables: **wo-bilẽ** [w.ō.b.ī̀lẽ.] 'little one', **púlo** [p.ʉ́lō.] 'ground peas'. Also, there is no other nonsuspect consonant cluster in Tyebaara. In the phonetic transcriptions the period signifies nonphonemic length of the consonant or vowel preceding it.

In subtype 2a, chart 13, unlike in the other subtypes, V_1 is longer than V_2 resulting in a syncopated beat, **1**-2. The final i is not only shorter than lower vowels, but it tends to be reduced in length and sometimes to be elided when it occurs before open juncture. It is always elided when it occurs preceding a geminate consonant. When the final vowel is elided, the final consonant is lengthened. In both cases, the vowel of the first syllable is lengthened to compensate for the short or elided vowel of the final syllable.

			(91)
kárí	[k.á.ř̀í ~ k.á.ř́]	'to go'	
gɔ̀rìrɔ̀	[g.ɔ̀.r̀ř̀ɔ̀]	'cotton'	
lálì	[l.á.l̀ ~ l.á.lì]	'the time'	
kã́mì bé:	[k.ã́.m̀.b.é:]	'that way'	

In subtype 2b of chart 13, the medial consonant is elided, resulting in a syncopated beat, **1**-2. This subtype is restricted to the generic form of the **wii**-class nouns (chart 7). In this subtype C(R)VV, V_1 may be any vowel and V_2 is always a back rounded vowel o or ɔ. Further restrictions are listed under Vowel Distribution (page 156), for example: **nãɔ̃** [n.ã.ɔ̃] 'a man'.

(d) The monosyllabic long rhythm unit is realized as three subtypes: C(R)V:, V:, and N:. The most common is C(R)V:. The other two types are limited to a few words.

The C(R)V: subtype has two variants of duration:

longer duration in a disyllabic rhythm pattern, long-short (—=.):

fã:=nã [f.ã̀:.nã́.] 'act of building' (n), and (92a)

shorter duration in a monosyllabic rhythm pattern, long (—):

fã: [f.ã̀:] 'to build' (v) (92b)

The relative durations of long and short monosyllabic word rhythms are shown in chart 16. Even though the two approach each other in length, the duration difference is distinguished both by a slight difference in length, and indirectly by a different quality of vowels.

The subtypes V: and N: occur only in monosyllabic basic words: **ɛ̃ɛ̃** 'yes' and **m̀:** 'yes' (response by women).

(3) Word rhythms. Minimum rhythm units occur alone and in combination in basic words, resulting in the following four word rhythms:

two simple rhythms, each consisting of one rhythm unit:

short (.), monosyllabic

long (—), disyllabic syncopated; monosyllabic long; disyllabic long

two complex rhythms, each consisting of two rhythm units separated by semiopen juncture (=):

short-short (.=.) disyllabic regular beat
long-short (—=.) disyllabic syncopated plus monosyllabic; monosyllabic long plus monosyllabic.

The following illustrate each type of word rhythm:

Monosyllabic word rhythms: (93)

short C(R)V — **long** C(R)V:

tjã̄ [cʌ̃] 'to know' — **tjã̄:** [cˡã̄.] 'to drop'

Disyllabic word rhythms (simple):

long C(R)V:V — **long** C(R)VCV

tjã̄:ã̄ [cˡã̄:] 'dropping' (ct v) — **tjãnã̄** [cɛ̃nɛ̃] 'calabash'

Disyllabic word rhythms (complex):

short short C(R)V=CV — **long short** (C(R)V:=CV

tjã̄=nã̄ [cʌ̃nʌ̃] 'knowledge' — **tjã̄:=nã̄** [cˡã̄:.nã̄] 'act of dropping (n)

long short C(R)V:=CV

tjã̀:=nã̄ [cˡà:nã̄] 'to spin'

Trisyllabic word rhythms (complex):

short short short C(R)VCV=CV/V

tjãnã̄=nã̄ [cɛ̃nɛ̃nɛ̃] 'act of cutting' (n)

(4) Characteristics of word rhythms. The distribution of the variants of duration, consonants, and vowels characterizes the different types of word rhythms. The combinations of consonant and vowel variants differ according to the type and subtype of word rhythm.

Chart 14

DISTRIBUTION OF VARIANTS IN WORD RHYTHMS

Word Rhythm	**short**	**long**		**short-short**	**long-short**	
subtype	A	B	C	D	E	F
syllable	C V	C V:	C V.C V	C V=C V	C V.C V=C V	C V:=C V
duration	1 2+	1 1	1 3 3 2	1 2 2 2	1 3 3 2 2 2	1 1+ 2+ 2
V	2	1	3 3	2/3 2/3	3 3 3	1 2
C	1	1	1 3	1 2	1 3 2	1 2

In chart 14 the variants are listed for the subtypes in which disyllabic word rhythms are manifested with the same vowel in all syllables. The other subtypes, CiCV/CuCV and CVCi, are given in chart 15. The letters in the second line from the top of charts 14 and 15 and also those listed vertically at the left in chart 16 are labels for the word rhythm subtypes which are realized as the syllable patterns listed underneath the letters in the third line of charts 14 and 15. The numbers in lines 4, 5, and 6 are distribution class labels, explained in chart 14a and used in charts 14 and 15 and on pages 128f. and 131.

Chart 14a

SIGNIFICANCE OF NUMBER LABELS IN CHARTS 14 AND 15

Numbers:	1	1+	2	2+	3
Duration	long	extra-long	short	medium-short	extra-short
Vowel	cardinal		centralized		most centralized
Consonant	fortis		lenis		very lenis

All the rhythms are characterized by initial fortis consonants. The rhythms D, E, and F are characterized by moderately lenis consonants following juncture. However, the rhythms C and E have very lenis consonants in syllable 2, as no juncture precedes them.

The shortest duration of the first vowel and the most centralized vowel variants are concurrent in patterns C and E. Because of the vowel harmony rules (page 156), the quality of the second and third vowels is the same as the quality of the first vowel in each rhythm. Therefore, even though the second and third vowels in rhythms C and E have longer duration than the first, all the vowels are realized as the most centralized variants because they harmonize with the first vowel. The vowel of the final syllable which follows prefinal juncture is not as centralized as those preceding it. The short vowels have a more centralized quality whether short as in D, or longer-short as in A. Similarly, the cardinal vowel quality of the long vowels remains stable, whether it is long or extra long.

Chart 15

DISTRIBUTION OF VARIANTS IN WORD RHYTHMS

word rhythm	**long**		**short-short**		**long-short**	
subtype	C-2	C-3	D-2	D-3	E-2	E-3
syl	Ci/u.C V	C V .C i	Ci/u=C V	C V =C i	Ci/u.C V =C V	C V. C i=C V
dur	1 3 3 2+	1 2+ 3 3	1 2 2 2+	1 2+ 2 3	1 3 3 2+ 2 2	1 2+ 3 3 2 2
V	3 2+	2+ 3	2 2+	2+ 3	3 2+ 2	2 3 2
C	1 3	1 3	1 2	1 2	1 3 2	1 3 2

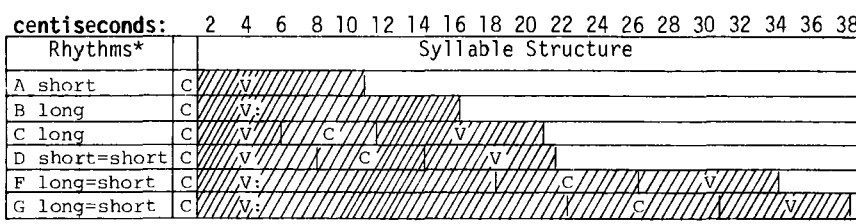
Five additional patterns occur as variants of C, D, and E. These are shown in chart 15. When a very short vowel occurs in the initial syllable, the second syllable is slightly lengthened in compensation in subtypes C-2, D-2, and E-2. In C-3 and E-3 the first vowel is lengthened to compensate for the shortness of the second vowel. The vowel quality is more centralized in every case where the vowel is shorter.

(a) Duration variants of consonants and of phonemically short and long vowels may be caused by: the number of syllables in a word (see chart 16), the type of juncture following the vowel or preceding the consonant (see chart 12), and the type of vowel sequence in the word (see chart 13). Chart 16 shows the duration variants of short and long vowels and of medial consonants in the various word rhythms. The initial consonant durations are not included. The examples are given following the chart. The letters for each pattern correspond to those of chart 14a, with the exception that rhythm E is not included because of lack of data, and G is added. G is the long-short rhythm which includes grammatical juncture in addition to semiopen juncture.

The number of syllables causes duration variants. There is isochronic realization of patterns CV and CV: and of CVCV and CV:, as monosyllabic words tend toward the same length and CVCV and CV: in CV:=CV tend toward being the same length. The full length of the long syllable is realized in disyllabic words. (Chart 16 is based on McKinney's oscillograms.)

Chart 16

DURATION VARIANTS IN WORD RHYTHMS



* The equal sign signifies semiopen juncture. No symbol signifies closed juncture or no juncture between two syllables. Examples from which these measurements are taken are:

A **fǎ** 'run' B **fā:** 'build' C **fā̆nā́** 'wither' D **fǎ=nǎ** 'running' (n) F **fā́:=nā́** 'to deceive' G **fā:=nā** 'building (n)

The chart shows that the variants of short and long vowels in monosyllabic words approach each other in actual duration. There may be only 35 percent difference in their durations. The short syllable of the monosyllabic word, rhythm A, spreads to fit within the minimum duration of a word while the long syllable contracts to fit within the maximum duration of a monosyllabic word, rhythm B. A polysyllabic word, however, allows the normal variants of the short and long vowels to be manifested (word rhythms C, D, and F). Here the long vowel may be 70 percent longer than the short vowel. Slight variations in this environment are caused by other factors such as vowel sequence and juncture.

Types of juncture affect duration variants. Word rhythms C and D, although of about equal total length, differ in the length of their individual segments. The vowels in word rhythm C are 6 centiseconds and 9 centiseconds respectively, manifesting a syncopated beat of the long rhythm unit, while the vowels in word rhythm D are 7-1/2 and 7 centiseconds respectively, manifesting the regular beat of a short-short rhythm unit. Also, the medial consonant in word rhythm C is slightly shorter than the medial consonant in word rhythm D. The consonants following prefinal juncture in word rhythms D and F are longer than are those not preceded by juncture. The long vowel preceding prefinal juncture, when grammatical juncture is also present is 22 centiseconds in rhythm G, contrasting with the 18 centiseconds of the long vowel in rhythm F where grammatical juncture is not present.

Vowel sequences affect duration variants. In a polysyllabic word, vowel sequences may be sequences of identical vowels or sequences of high close vowels i or u and a lower vowel (see chart 13).

A word which contains two vowels, one being i or u, and the other being a lower vowel, manifests nonphonemic lengthening of the lower vowel. This occurs in words of CiCV/CuCV and CVCi types whose vowels are phonemically short, and also in words of CVCi type which carry the prosody of length. The nonphonemic length is manifested on a lower vowel to compensate for the extreme shortness of a high vowel.

short vowels		long vowels		(94)
CVCV	**CVCi, CiCV**	**CV:CV**	**CV:Ci**	
kara [kaŕa] 'to clutter'	**kārī** [ká.ŕí ~ ká.ŕ̤.] 'to go'	**kã:nã** [kã:nã] 'to growl'	**kã:ri** [kã:.ŕī ~ kã:.ŕ̤] 'to be stupid'	
kara [kāŕā] 'to clutter'	**kīrā** [kíŕā.] 'a type of illness'			

In the phonetic transcriptions of the above examples, the addition of one dot following the short vowel, and of three dots in the words following the long vowel, indicates added nonphonemic length. The high vowel i in each case is very short. In final position, the i is sometimes lost, in which case the lower vowel is even longer to compensate for the elided one, and the consonant is also lengthened.

(b) Consonant variants help to determine rhythm patterns. The distribution of the consonant variants within the basic word helps to distinguish the four types of word rhythms.

Consonants and their variants are divided into three distribution classes:

C-1 Fortis and long variants of all consonants. These are marked C̈ in the phonetic transcription. All consonants followed by secondary release (CR).

C-2 Lenis or lightly articulated variants of voiced stops and approximants /b, d, g, m, l, y, w/. These are marked C̤ in the phonetic transcription. These tend to have slightly longer articulation than

the C-3 variants but much shorter than C-1 variants. The variants of w and y are more vowellike. The variants are: /b/ [b̥], /d/ [d̥ ~ ř], /g/ [g̥ ~ ʔ], /l/ [l̥ ~ ŋ], /m/ [m̥], /w/ [u], /y/ [j].

C-3 The extra lenis and extra quick variants of /b, d, g, m, l/ (marked C in the phonetic transcription). These have the shortest duration and may be spirantized, slurred over, or flapped, according to the type of consonant. The variants are: /b/ [b ~ β ~ m], /g/ [g ~ ɣ ~ ŋ], /d/ [ř], /l/ [l ~ ŋ], /m/ [m].

Distribution class 1. The C-1 variants may be two to three times longer than the lenis variants of the same consonants.

l ā l ā lālā [lālā] 'time' (95)
14 4 centiseconds

Slightly shorter and less fortis variants of the C-1 consonants are manifested in words with the feature of length, but these are still about twice as long as the C-2 and C-3 variants:

f ā̃: n ā̃ **fā̃:nā̃** 'to deceive' (96)
14 8 centiseconds

Softly spirantized and palatalized alternates of labial stops and labiodental fricatives occur preceding i:.

pī:mā̃ [pʲī:mɛ̃] 'childishness' (97)
bī:rī [bβʲī:řī] 'flying termites'
fī:gē [fʲī:gē] 'to swing'

(These are similar to the sounds described by Welmers [1950: 494f.].)

Distribution class 2. The C-2 list of variants includes variants of only seven of the sixteen consonants. They do not include consonants accompanied by the secondary release feature. The consonants w and y are included in the C-2 consonants, but not in the C-3 consonants. The C-2 list of variants does not include spirantized alternants of b and g, but it does include a glottal alternant [ʔ] of /g/ which occurs among some speakers, particularly in sections of Korhogo and Dokaʔa under the following conditions:

/g/ [ʔ ~ g] occurs in words where $V_1 = V_2$ and V_3 in the unstressed short rhythm unit following prefinal juncture, when the prefinal juncture is preceded by a long rhythm unit including any consonant plus -olo, -ala, -ɔ̃nɔ̃, -ɛ̃nɛ̃.

fālā=gā [fālāga ~ fālāʔa] 'boulder, table-rock' (98)
kā-dā̃nā̃=gā [kādɛ̃ŋɛ̃gɛ ~ kādɛ̃ŋɛ̃ʔɛ] 'stone'
kolo=gō [kōlōgō ~ kōlōʔō] 'road'

The glottal stop occurs elsewhere as a feature of glottalization (see page 148f.).

[g] occurs elsewhere following prefinal juncture:

kālā=gī [kālāgī] 'to ruin, destroy' (99)
sere=ge [sēřēgē] 'to press on'

The consonant d has two alternants of the C-2 type. These occur under the following conditions:

/d/ [d] fluctuates with [ɾ] following prefinal juncture after a disyllabic long rhythm unit which ends in the syllable [lV] or [nV].

pî:-fálí=da	[pî:fálída ~ pî:fálíɾa]	'seeds'	(100)
nyũ̂-djé:-mũ̂nũ̂=dò head-wash-cleanse-a	[ɲũ̂jé:mũ̂nũ̂dò ~ ɲũ̂jé:mũ̂nũ̂ɾò]	'ritual purification'	

[ɾ] occurs elsewhere following prefinal juncture:

sjɛ̃:=da	[sjɛ̃:ɾɛ̃]	'words'	(101)
sjɛ̃:-líbé=de word-heavy-some	[sjɛ̃:líβáɾɛ̃ˆ]	'worthy words'	

The consonant l has two alternants in the C-2 list of variants:

/l/ [l] occurs following prefinal juncture in words without the feature of nasalization.

lɛ:=la	[lɛ̄:.lɛ̄]	'a portion'	(102)

[n] occurs following prefinal juncture in words with the feature of nasalization.

mɛ̃:=lã	[mɛ̃:.nɛ̃]	'a cord'	(103)

Distribution class 3. The C-3 list of variants includes variants of only five of the sixteen consonants. These are the same consonants as the C-2 list except for y and w which are not included in C-3. The C-3 list of variants includes the spirantized variants of b and g which occur under the following conditions:

/b/ [b] fluctuates with [β] when it occurs as the medial consonant in long word rhythms. [β] is heard more frequently between open vowels and in long-short trisyllabic word rhythms.

líbé	[líβé>]	'to be heavy'	(104)
kàbà	[kàβà ~ kàβà]	'to compete'	
kábá=lá	[kábálá ~ káβálá]	'to contradict'	

/g/ [g] fluctuates with [ɣ] when it occurs as the medial consonant of a long word rhythm. [ɣ] is heard more frequently between open vowels and in long-short word rhythms.

tugo	[tugo ~ tuɣo]	'carry on head'	(105)
fàgà	[fàgà ~ fàɣà]	'marsh, swamp'	
gbőgő=gő	[gbőɣógo]	'bucket'	

[g] fluctuates with [ŋ] in some words which have the feature of nasalization.

ŋãgá	[ŋãgá ~ ŋãŋã]	'to be unjust, lawless'	(106)

(This means that ŋ is an alternant of w in word initial position and of g in rhythm unit medial position.)

Distribution of consonant variants. The distribution of the three groups of consonant variants is as follows:

C-1 in initial position in a word rhythm, always in a stressed syllable.

pã [pã˘] 'to come' (107)

C-2 in initial position in a rhythm unit following prefinal semiopen juncture, and never in a syllable bearing stress.

pĩ:=bẽlẽ [pĩ:bə̃lə̃] 'the children' (108)

C-3 in medial position in a polysyllabic long rhythm unit, and never in a syllable bearing stress.

tugo=rõ [t ũ ɣ ō ř õ] 'a burden' (109)
C-1 C-3 C-2

The following contrasts the three classes of consonant variants. The consonants illustrated are underlined.

C:	C-1	C-2	C-3 (110)
/b/	**kā-ba:=la*** [kāba:la] 'food gift'	**wiā=bé**** [wā:bé] 'he-fut-them'	**kābā=lá** [kāβālá] 'contradict'
/d/	**dĩbĩ** [dɨβɨ] 'type of fetish'	**ti:=de** [tĩ:ře] 'trees' (many)	**tide** [tɨře] 'to grind'
/g/	**gòlò** [gòlò] 'chicken'	**tjólō=gō** [cólōgō] 'to be healthy'	**sogo=lo** [sōɣōlō] 'to attach'
/m/	**kā-mānā=ga*** [kámãŋã=gã] 'mixture of mud and straw for building'	**kã=mã** [kãmã] 'boiling' (n)	**kãmã=gã** [kãmãgã] 'short-handled hoe'
/l/	**kā-lā:=gĩ†** [kālá:gĩ] 'the hawk'	**kārĩ=la** [kářĩlā] 'a trip'	**kālā=gí** [kālágí] 'to destroy'
/n/	**nānā** [nɛ̃ŋɛ̃] 'to chase'	**ka-pā-nā*** [kapāŋā] 'reason for coming'	**pãnã** [pãŋã] 'to be incomplete'
/y/	**ye** [yē] 'you-pl-hort'	**kē=yè** [kèjè] 'villages'	--
/ɲ/	**ɲyɔ̃:** [ɲɪɔ̃:] 'to be pretty'		
/w/	**wōlō** [wølø] 'we' (exclusive)	**wii=wi yiri** [wĩ:ɥɨ yĩrĩ] 'he is calling him'	

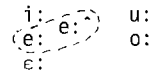
* Compound word ** Expanded word † Compound expanded word

(c) Vowel variants help to determine word rhythms. Distribution of the vowel variants within the basic word also helps to distinguish the four types of word rhythms.

Vowels and their variants are divided into three distribution classes. Distribution classes are listed first; variants are described in detail under each class.

The distribution classes are divided according to restrictions of the vowels and their variants in regard to word rhythms.

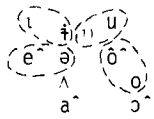
V-1 Long word rhythms containing syllable types C(R)V:



(111)

sǐ: [sǐ:] 'life' **sĩ:** [sĩ:] 'two'

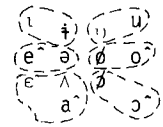
V-2 Short word rhythms containing syllable types C(R)V



(112)

pe [pə̄] 'to be soft' **tɨ́** [tɨ̋] 'to become full'

V-3 Long word rhythms containing syllable types C(R)VCV



(113)

tĭgi [tɨ̆gɨ̆] 'to descend' **tãmã** [tãˆmãˆ] 'to teach'

Each of these simple word rhythms may be expanded to become complex word rhythms. The complex rhythms have the same vowel distribution as the comparable simple rhythms:

long	C(R)V:	long-short	C(R)V:=CV/V
short	C(R)V	short-short	C(R)V=CV/V
long	C(R)VCV	long-short	C(R)VCV=CV/V

In basic words, the vowel sequence and the quality of vowels of succeeding syllables are determined by the vowel of the first syllable and by word rhythm. Chart 14 shows the relationship of the duration of the first syllable to the quality of the vowels of the word rhythms.

The vowel variants for each distribution class are described briefly below, followed by a combined list of all the variants.

Vowel variants of distribution class 1 are comparable in quality to the cardinal vowels. The quality of the long variants is relatively stable, variations being limited to the oral e: and the nasal ɛ̃: which become [ɪeˆ.] and [ɪɛ̃ˆ.] following tj and dj.

tjɛ̃: [cˡɛ̃ˆ.] 'to strangle' **tjê:** [cˡêˆ.] 'to refuse' (114)

Vowel variants of distribution class 2 are more centralized than are the variants of class 1. The quality of class 2 variants is the less stable of the two classes, varying from near the cardinal vowel quality to a centralized quality. The variations in quality are caused by the longer or shorter duration of the vowel and by the preceding contiguous consonant.

In general, the vowels in the monosyllabic short word rhythm approach the cardinal vowel quality:

ki [kī]	**sĭ** [sĭ]	**pe** [pē>]	(115)
'it'	'even'	'they'	

However, when these words occur in the disyllabic short-short word rhythm, the vowel is shortened and becomes more easily assimilated to the preceding consonant.

ba=gi pje [bāgɨ̆ pjē.]	**a=be lĭ:=lé** [ābə̄ lĭ:lé^]	(116)
'Come do it.'	'Have they eaten?'	

Class 2 vowels are affected strongly by preceding consonants when they occur in a syllable with stress, since the stressed consonant is longer and pronounced with more force than the nonstressed consonant. This is particularly true in words with strong sentence focus stress, which are often verbs or nouns. In the following examples, the period indicates nonphonemic medium length.

peñ pe [p.ē>.m̃ p.ə̄.] 'They are soft.' (117)

The verb 'to soften' has strong sentence stress as well as word stress. The word **peñ** 'they are' is a long rhythm group. The vowel is lengthened nonphonemically to compensate for the elision of i. The underlying form [pemĭ] has become [pe>.m̃]. Because it is lengthened, the vowel is less affected by the preceding consonant.

Class 2 vowel variants assimilate to consonants as follows: the high and higher mid spread oral vowels are centralized following grave consonants, i.e., the labials and velars:

bĭ [bɨ̆]	'in order to'	(118)
fe [fə]	'farina'	

They are more fronted elsewhere: **sĭ** [sĭ] 'even'.

The higher mid oral rounded vowels and the low nasal rounded vowel are raised following diffuse consonants, i.e., labials and alveolars:

kpó- [kpó^]	as in	**kpó-solomɔ̀**	'yam'	(119)
pɔ̃- [pɔ̃^]	as in	**pɔ̃=bɛ̀lɛ̀**	'the dogs'	

They are lower elsewhere: **gŏ-** [gŏ] as in **gŏ=bɛ̀lɛ̀** 'the chickens'.

The high oral and nasal rounded vowels are fronted following acute consonants, i.e., the alveolars and palatals:

sũ- [sʉ̃]	as in	**sũ-pilɛ̀**	'grain of millet'
tũ- [tʉ̃]	as in	**tũ-mɔ̃rɔ̃**	'iron'

They are more back elsewhere: **gũ-** [gũ] **gũ-bi:gɛ̀** 'wall'.

The nasal central spread vowel is fronted between two palatals:

tjã=yà [cæ̃jæ̃] 'days' (121)

They are more central elsewhere: **kã̀** [kʌ̃́] 'to boil'.

The nasal high spread vowel is centralized: **sĩ̀** [sɨ̃́] 'to be right'.

Vowel variants of distribution class 3 are the shortest variants, and they assimilate to contiguous consonants preceding and following them. They also assimilate to following vowels. This class of variants does not include variants of cardinal vowel quality. Class 3 variants are the least stable in quality of all the distribution classes.

Besides the assimilations to preceding consonants which occur in class 2 above, the class 3 variants have the following assimilations which do not occur in class 2 or in class 1.

In the subtype in which $V_1 = V_2$, the following variants occur:

The high and higher-mid spread oral vowels are centralized preceding velars g and w, and back vowels:

tĩgĩ [tɨ̃gɨ̃] 'to descend' (122)

tjéw̃ [cə́w̃] 'the woman'

peò [pēòˆ ~ pōːˆ] 'they are (not)'

They are more fronted elsewhere: **tĩrĩ** [tɨ̃ř̃ɨ̃] 'descending'

The oral low central vowel a is fronted and raised when it occurs between grave stop consonants k, g, p, or b and l, or between palatals and r or l, and between continuant acute consonants s or l, and b:

bàlá [bɛ̀lɛ́ ~ bʌ̃lʌ̃́] 'which ones' (123)

tjàlà [cɛ̀lɛ̀ ~ cʌ̃lʌ̃] 'to tremble'

yárárá [yɛ́řɛ́řɛ́ ~ yʌ́řʌ́řʌ́] 'slowly'

sábá [sɛ́bɛ́ ~ sʌ́bʌ́] 'to write'

labala [lɛ̄bɛ̄lɛ̄ ~ lʌ̄bʌ̄lʌ̄] 'to be stupid'

It is centralized elsewhere, including environments in which the second vowel is not the same as the first one:

tjàlĩ [cà^lɨ̃] 'to spread' (123a)

sàrà [sà^řà^] 'to pay'

yariga [yā^řīga^] 'a thing'

The nasal low central spread vowel is fronted and raised when it occurs before n, following any stop except p or b, and following any continuant, except ŋ:

tjãnã [cɛ̃nɛ̃ ~ cʌ̃nʌ̃] 'a calabash' (124)

nãnã [nɛ̃nɛ̃ ~ nʌ̃nʌ̃] 'to chase'

gbã̂nã̂ [gbɛ̃̂nɛ̃̂ ~ gbʌ̃̂nʌ̃̂] 'to be mischievous'

tã̀:-nyãnã [tã̀.ɲɛ̃́nɛ̃̂ ~ tã̀.ɲʌ̃́nʌ̃̂.] 'friend'

It is centralized elsewhere:

tjə̀mə̀	[cə̀ˆmə̃ˆ]	'good, well'	(124a)
fə̄nə̄	[fə̄ˆnə̃ˆ ~ fɐ̃nɐ̃]	'to wither'	
tə̀:-nyə̄wə̀	[tə̀.ɲə̄ˆù ~ tə̀.ɲɐ̃ù]	'the friend'	

The oral back rounded vowels are more centralized in a long rhythm unit in a CVCV sequence when the preceding consonant is diffuse (kp, gb, p, b, t, d, tj, dj, v, f, s, z, w, y) and when the following is l or r. The nasal back rounded vowels are more centralized in a long rhythm unit in a CVCV sequence when the preceding consonant is one of the above diffuse consonants or is ŋ or m, and when the following consonant is n.

kpɔ́lɔ̄	[kpǿ̜lø̜̄]	'to be large' (pl)	(125)
tjɔ̀rɔ̀	[cø̜̀ř̞ø̜̀]	'to hang'	
fɔ̀lɔ̀	[fø̜̀lø̜̀]	'to accept'	
fùrù	[fʉ̀ř̞ʉ̀]	'to be pierced'	
mɔ̄̀nɔ̄̀gɔ̀	[mø̜̄̀nø̜̄̀gø̜̀]	'sorghum'	
tɔ̃nɔ̃	[tø̜̃nø̜̃]	'to be long'	

The less centralized variants occur elsewhere:

gbógɔ́	[gbóˆgóˆ]	'not properly closed'	(125a)
sógí	[sógí]	'to be burned'	
mɔ̃́gɔ́	[mɔ̃́ˆgɔ́ˆ]	'to be paralyzed'	
kùrù	[kùřù]	'to fold'	
kɔ̀lɔ̀	[kɔ̀ˆlɔ̀ˆ]	'a chair'	
kɔlɔ̀	[kɔ̃ˆlɔ̃ˆ]	'a hand'	

In the subtype in which V_1 is i or u, and V_2 is a lower vowel, the high close vowel is centralized:

kɨ̀lɛ́	[kɨ̀lɛ̂ˆ]	'to pull'	(126)
kʉ̀lɔ̀	[kʉ̀lɔ̂ˆ]	'foreign country'	

In the same subtype when combined with the feature of nasalization, the front variant of ã [ɛ̃] occurs as the second vowel when the first vowel is ĩ. This fluctuates with [ɐ̃]:

sɨ́nɛ̃́	[sɨ́nɛ̃́ ~ sɨ́nɐ̃́]	'to lie down'	(127)

Summary of the vowel variants in the three distribution classes:

Vowel Class:	**V-1**	**V-2**	**V-3**	(128)
/i/	[i: ~ ĩ:]	[ɪ ~ ɨ ~ ɨ̃]	[ɪ ~ ɨ ~ ɨ̃]	
	ti:=ge [tĩ:gẽ] 'tree'	**ti** [tĩ] 'it'	**tɨgɨ** [tɨgɨ̃] 'to descend'	
	tĩ:=mã [tĩ:mẽ̃ ~ tĩ:mɐ̃̃] 'medicine'	**tɨ́** [tɨ́] 'to be full'	**nɪ̀ř̞ɪ̀** [nɪ̀ř̞ɪ̀] 'to be strong'	

Vowel Class:	V-1	V-2	V-3
/e/	[e: ~ eˆ:]	[eˆ ~ ə]	[eˆ ~ ə]
	lé: [lé:] 'taking'	**le** [lēˆ] 'to put in'	**sélí** [séˆ.lí] 'to begin'
	djē:=le [ɟˡéˆ:lēˆ] 'entering' (n)	**fé** [fə́] 'running'	**félé** [fələ́] 'to tamp down'
/ɛ:/	[ɛ: ~ ɛ̃: ~ ɛ̃ˆ:]		
	pɛ́: [pɛ́:] 'to sweep'		
	pɛ̃: [pɛ̃:] 'to be insipid'		
	tjɛ̃: [cˡɛ̃ˆ.] 'to groan'		
	[a: ~ ã:]	[aˆ ~ æ̃ ~ ãˆ ~ ʌ̃]	[aˆ ~ ʌ ~ ɛ ~ ãˆ ~ ʌ̃ ~ ɛ̃]
	tjǎ: [cˡǎ.] 'to know'	**tjǎ=nǎ** [cʌ̌nʌ̌] 'knowing' (n)	**tjãnã** [cɛ̃nɛ̃ ~ cʌ̃nʌ̃] 'calabash'
	fá:=lá [fá:lāˆ] 'any'	**fâ=bèlè** [fâˆbələ] 'the fish' (pl)	**fálá** [fáˆlâˆ] 'to cultivate'
		tjã=yà [cæjæ̀] 'days'	
	tǎ:=rí [tǎ:ř́ī] 'walking'	**sǎ** [sǎˆ] 'where'	**fàgà** [fʌgʌ̀] 'marsh'
	ya:=mǎ [yā:mǎˆ] 'illness'	**ya=la** [yāˆlāˆ] 'small thing'	**yala** [yɛlɛ̄] 'to be right'
/ɔ/	[ɔ: ~ ɔ̃:]	[ɔˆ ~ ɔ̃ˆ ~ ɔ̃]	[ɔˆ ~ ø ~ ɔ̃ˆ ~ ø̃]
	sɔ́: [sɔ́:] 'to be clogged'	**sɔ́-pjá** [sɔ́ˆpjáˆ] 'measles'	**sɔ̀lǐ** [sɔ̀ˆlì] 'to be early'
	tí:-tɔ̃́:=nɔ̃́ [tī:tɔ̃́:nɔ̃́ˆ] tall tree'	**ñ-dɔ̃́=nɔ̃́** [ñ.dɔ̃́ˆnɔ̃̄ˆ] 'hat'	**tɔ̃nɔ̃** [tø̃nø̃] 'to be long'
	fɔ̀ɔ=lɔ [fɔ̀ːlɔ̄] 'owners'	**kǎ-fɔ́=ẁ** [kàˆfɔ́ˆù] 'lord, the owner'	**fɔ̀lɔ̀** [fø̀lø̀] 'to agree'
/o/	[o:]	[o ~ oˆ]	[oˆ ~ ø]
	fò: [fò:] 'python'	**fó-djoː** [fóˆɟᵘōː] 'raffia'	**folo** [fø̀lø̀] 'explode'
	gòo=lo [gòːlōˆ] 'chickens'	**gǒ=bèlè** [gǒbələ] 'the chickens'	**gòlò** [gòˆlòˆ] 'a chicken'

Vowel Class:	V-1	V-2	V-3
/u/	[u: ~ ũ:]	[u ~ ʊ ~ ũ ~ ʊ̃]	[u ~ ʊ ~ ʊ̃]
	sú: [sú:] 'to pound'	**kú-tí:** [kútí:] 'judgment'	**fùrù** [fʊ̀ř ʊ̀] 'pierced'
	fṹ:=ró [fṹ:řō^] 'blindness'	**tṹ** [tʊ̃] 'to argue'	**kṹnù** [kʊ̃nʊ̀] 'to shave'

8.2.4 Length is a distinctive feature of the basic word. It occurs only once and serves to distinguish meaning. It is carried on the initial stressed syllable of the word and spreads over to the suffix, causing slight lengthening of the suffix consonant and a smaller degree of length on the suffix vowel. The suffix vowel of the word with the length feature is normally longer than that of the word without length. But there are some exceptions, as when the final vowel of the short word is lengthened due to closed juncture (see chart 16).

In this study, length is written with a colon following the vowel of the initial syllable. The examples below show the contrast of duration of words with and without length. The number of centiseconds is given for all but the first segment of each word.

(129)

	With length	**Without length**
	fã̀:nã̀ [fã̀:nã̀] 'to deceive'	**fã̀nã̀** [fã̀^nã̀^] 'running' (n)+
	f ã̀: n ã̀	f ã̀ n ã̀
centiseconds:	18+ 8+ 8	8 6 7
	34	21

+ as in **mʊ̃bílíẁ fã̀nã̀**
'truck/car driving'

Length is important in Tyebaara, occurring in approximately one-third of the words, according to counts made in word lists and text materials.

(1) Interpretation of length. Length is considered a distinctive feature of the basic word for these reasons:

* There are no nonsuspicious sequences of heterogeneous vowels in the initial syllable of the basic word. The clusters of ia, ie, iɛ, uɔ, and uo recorded by Welmers (1950:124f), pattern as the palatalized and labialized variants of the prosody of secondary consonant release (page 144).
* The only clusters of unlike vowels in the basic word are found in word final position. These are disyllabic vowel clusters which result from the reduction of the w in the indefinite suffixes of **wii**-class nouns (page 158f.).
* Although a few cases can be cited where a medial consonant is elided in an alternant form of a stem, the majority of the many words with length do not have alternate forms. For example, for the

word 'spider', some say **bēleo** [bə̄lə̄ō], and others say **bēeo** [bē:ō]. The completive form of the verb 'to be sweet' is **tãnã̄** [tɛ̃nɛ̄], and the continuative form is **tã̆:** [tã̆:] 'becoming sweet'. In both cases the long vowel has the duration and quality of a long vowel and not the quality of two short vowels. When the medial consonant is elided, the resultant form adjusts in length and quality of vowel to the long syllable type.

(2) Characteristics of length. The feature of length is characterized by three aspects: proportionate duration, quantity, and quality of vowels and consonants. While the quantity of long vowels may be reduced in some environments, their quality varies very little.

(a) Proportionate length. The duration of consonants relative to that of vowels is one aspect of the feature of length. In words having the length feature, the consonants and vowels of the initial syllables are close to equal length, or else the long vowel is longer than the initial consonant. On the other hand, in words without the length feature, the consonant of the initial syllable is from two to three times as long as the vowel of the initial syllable.

This is true even in words where the length of the long vowel has been greatly reduced. In sentences 1 and 2 of example 131 below, in the two utterances of the word **fã:** (with length) the proportion of consonants to vowels is 15 to 10 and 16 to 11 (only 5 centiseconds difference in each case). However, in the example without length, **fã̆,** the proportion of consonant to vowel in both utterances is 20 to 12 and 19 to 9, a difference of 8 and 10 centiseconds between length of consonants and vowels. In the short word, then, the consonant is about twice as long as the vowel, whereas in the word with the length feature, the consonant is one-third longer than the vowel. When the long word was reduced due to sentence structure, both the consonant and vowel durations were reduced.

In utterances of words having length, in which the long word has not been greatly reduced due to sentence structure, the vowel may be longer than the initial consonant. This is illustrated in the following word:

f ã: l é 'build?' (build + question particle **lē**) (130)
16 20 4 8

The long vowel retains its normal length when not followed by open juncture.

(b) Quantity. There is a significant difference in duration between words with the feature of length and those without it when those words occur in similar environments.

The duration of short and long vowels is regulated by environment. In some environments, the long vowel may be 70 percent longer than the short vowel in the same environment. In other environments, it may be only 35 percent longer. Even in the environment in which the monosyllabic stem is followed by open juncture and the difference between the long and short vowels is reduced, there is a significant difference in duration between the short and long vowels (chart 17).

When the stems with and without the length feature are compared in different environments, however, the duration contrast is not clear, and a certain degree of overlap of duration of long and short vowels occurs. This is shown in the following chart of duration variants of the first vowel in monosyllabic and disyllabic words. In the line below the syllable patterns, centiseconds are given for the initial vowel of each pattern.

Chart 17

DURATION VARIANTS OF LONG AND SHORT VOWELS

without length shortest variants		**with length** longest variants	
V_1 in disyllabics	in monosyllabics		in disyllabics
CVCV	CV	CV:	CV:CV
c/s 6-10	9-13	10-20	15-22

The shortest variants of short vowels and longest variants of long vowels are in disyllabic words, while the area of overlap of long and short variants is found in monosyllabic stems, preceding open juncture.

The difference in duration of vowels in words with and without the length feature is caused by environment. The environments which affect length are: the structure of the word, the structure of the sentence, and sentence focal stress.

Variants due to word structure. The number of syllables in words affects the length of short and long vowels, as has been illustrated in chart 17. Also, the sequence of vowels and the presence or absence of semiopen juncture causes minor variations in vowel length.

Variants due to sentence structure. Sentence structure causes variants in length of words. The number of words in a sentence affects vowel length in individual words, since the pressure of rhythm groups in the sentence may compress the word rhythms into shorter spaces. The following sentences illustrate this. Example 131, number 1 illustrates the length of the verb **fã̃** 'to run', which does not have the feature of length. In contrast, number 2 shows the duration of the verb **fã:** 'to build', which carries the length feature, but which is in a sentence containing one more word than number 1.

(131)

	without length					**with length**						
	wi ñ fã̃ 'he ran'					**wi ñ gĩ fã:** 'he built it'						
	w	i	ñ	f	ã̃	w	i	ñ	g	ĩ	f:	ã:
1a.	15	3	20		12	2a.	15		7	7	15	10
1b.	16		19		9	2b.	16		7	6	16	11

Each utterance was given twice (a and b). The speed of utterance differed slightly each time it was given, as the numbers of centiseconds registered for a and b show for each example. In each utterance of sentence 1, the short vowel is in reality longer than the long vowel in

sentence 2. This is due to the pressure of the added syllable in the rhythm group which comprises number 2. When these same words are in identical sentences, the word with the long vowel is longer than the one with the short vowel.

It is to be noted that, even when the contrast in total duration is lost in the above examples, the contrast still exists between the words in the proportionate duration of consonants and vowels to each other.

Variants due to stress. Stress on the sentence level may cause a word to be lengthened. Both sentence stress and focal stress cause lengthening of the word on which the stress occurs, since the word is pronounced more slowly. Focal stress most often occurs on the verb, but it can occur on nouns and adverbs also. (The stressed word is underlined.)

ki ñ kôrõ tjɛ̃:rĩ [kɨ̃ñ kõřõ c^{l}.ɛ̃::ř] 'Just a little is left.' (132)
sjɛ̃ɛ̃nɛ̃ [š^{l}.ɛ̃ːːnɛ̃] 'people!'

(c) Quality. Consonant and vowel lengths are further reflected in the quality of the vowels and the quality of the consonant release.

When the feature of length is present, the vocal organs are relaxed preparatory to saying the word. But when it is absent, the vocal organs are tensed preparatory to saying the word. This tension causes a consonant to be fortis and to have a quick fortis release followed by a centralization of the vowel. In words with length, however, the consonant is lenis, the release is lax, and the vowel is less centralized.

Variants in vowels. Vowel quality varies in relation to length. The vowel alternants which occur in words with the feature of length are close to the cardinal vowels. The long alternants are noncentralized in contrast to the tendency toward centralization which is found in short variants (see chart 4).

The greatest similarity between long and short vowels is found in monosyllabic words, where the short vowel has the longest duration alternant (and is therefore less centralized in quality), and where it is contiguous to a preceding consonant which causes it to move further away from centralized articulation. For example, alveolar and palatal consonants cause front vowels to become more fronted and more like long vowels in quality.

le [lê<] 'put in' / **lẽ:** [lẽ.] 'taking' (133)

The greatest contrasts in quality between long and short vowels are found in disyllabic words where the short vowels are shortest in duration.

kara [kɐ̄řɐ̄] 'to clutter' / **ka:rà** [kɑ̄:řà] 'meat' (134)

and in monosyllabic words where the short vowel follows a consonant which causes it to become centralized.

pe [pə̄] 'to be soft' / **pe:** [pə̃:] 'to be bad' (135)

The quality of the long vowels is always the same, even in environments where the duration is shortened. The quality of long vowels

Chart 18

VOWEL VARIANT CONTRASTS

Consonant position classes	Short			Long		
	Monosyllabics					
Labials	**mĩ**	[mɨ̃]	'you' (hortatory)	**mĩ:**	[mɨ̃:]	'I, my'
	pe	[pə]	'to be ripe, soft'	**pe:**	[pɛ̄:]	'to be bad'
Velars	**gbo**	[gbō]	'to drink'	**gbṍ:**	[gbṍ:]	'to carry on back'
	kṹ	[kṹ]	'to crunch'	**kṹ:**	[kṹ:]	'to cut out'
Alveolars and palatals	**tɨ̃**	[tɨ̃]	'to swell'	**tɨ̃:**	[tʲɨ̃:]	'weaving'
	sí	[sí]	'even'	**sɪ̀:**	[sɪ̀:]	'life'
	--	--	--	**lɛ:**	[lɛ̄:]	'to be old'
	Disyllabics					
Labials and velars	**fígí**	[fígɨ]	'extinguish'	**fí:gī**	[fí:gī]	'swinging'
	põ̀nɔ̃̀	[põˆnɔ̃<]	'small dog'	**pɔ̃̀ɔ̃nɔ̃**	[pɔ̃̀>ɔ̄nɔ̃>]	'dogs'
	porò	[põˆřòˆ]	'they' (specific)	**po:ro**	[põ:řō]	'mud' (for building)
Alveolars and palatals	**tjere**	[cēřē]	'body'	**tje:lè**	[cˡē:lè]	'thigh'
	tjãnã	[cɛ̃̄nɛ̃̄]	'cut up'	**tjã̀:nã̀**	[cˡã̀:nã̀]	'spin'
	--	--	--	**sjɛ̃̄:ra**	[šˡɛ̃̄:řɛ̄]	'words'
	tjóró	[cǿřǿ]	'count'	**tjó:rō**	[cˡó:řō]	'clay'
	tugo	[tūgō]	'carry on head'	**tu:go**	[tū:gō]	'rub together'

is not usually influenced by preceding consonants. Exceptions to this occur when mid front vowels e: and ɛ̃: are raised following tj and dj.

tjẽ: [cˡéˆ.] 'to refuse' (136)

djẽ: [ɟˡéˆ.] 'to enter'

tjɛ̃̄: [cˡɛ̃̄ˆ.] 'to strangle'

All Tyebaara vowels occur either with or without the feature of length, except ɛ which occurs only with the feature of length and never without it. Although a short variant [ɛ] occurs, it is a variant of /a/. The variants [ɛ] and [aˆ] are in mutually exclusive environments, and are therefore the same phoneme.

tã̄nã̄ [tɛ̃̄nɛ̃̄] 'to be sweet' (137)

sɨ̀mã̀ [sɨ̀mɛ̃̄ ~ sɨ̀mã̀ˆ] 'oil'

sɛ̀ʔɛ̀là [sɛ̀ʔɛ̀lɛ̀>] 'basket'

Particularly following a stem containing ɪ̃, the suffix vowel may

fluctuate among speakers between [ɛ>] and [ʌ]. No nonsuspicious minimal pairs occur. The suffix vowel of the word with the length feature is normally longer than that of the word without length, but there are some exceptions, as when the final vowel of the short word is lengthened due to closed juncture preceding the suffix.

The long forms a: and ɛ: occur in the same environment and are therefore both phonemic.

yɛ:lɛ 'liver', **ya:la** 'to yawn' (138)

Chart 18 has examples of long and short contrasts, grouped according to monosyllabics and disyllabics, and according to initial consonants in order to show the vowel variant contrasts in those environments.

Variants in consonants. Consonants vary in relation to length. The prosody of length affects the release of initial consonants and the length of medial ones. This is evidenced in the initial consonants by the increase of their lenis articulation and release, and by the spirantization of the fricatives.

Initial labial stops and labiodentals tend toward spirantization and palatalization when they precede i:.

bĭ:rĭ [bʁ^{j}ĭ:ř̆ĭ] 'flying termites' (139)

fĭ:gĭ [f^{j}ĭ:gĭ] 'to swing' (ct)

Alveolar stops also have a palatalized release when they occur before i:, as in **ti:ge** [t^{j}ī:gē] 'a tree'.

The consonant may be shortened slightly when length is concomitant with the secondary release feature because the secondary release is longer and glides into the vowel, taking up part of the duration of the long vowel (page 144), as in **tjɔ:lɔ̄** [c^{j}ɔ̄:lɔ̄:] 'a funnel'.

The approximants y and w become more vowellike in words with length:

without length	**with length**	(140)
ye [yē] 'to jump'	**ya:** [iā:] 'there'	
wagà [wāgà] 'leaf'	**wa?a** [uā?ā] 'to dry'	

This is particularly noticeable with ny [ɲ]. For example, compare **nyãgĭ** [ɲãgĭ] 'the tomb' with **nyă:gĭ** [ɲ^{l}ă:gĭ] 'the grass'.

In words where length is concomitant with nasalization, the strong nasalized release which is evident in short words is neutralized by the lenis release of the words having the length feature (page 149f.). For example, compare:

tĩ̃ [t^{n}ĩ̃] 'to swell' with **tĩ̃:** [t^{j}ĩ̃:] 'weaving' (141)

kũ̃ [k^{n}ũ̃] 'to crunch' with **kũ̃:** [kũ̃:] 'to cut out'

In disyllabic words with the feature of length, medial consonants are significantly longer than they are in words without length. Compare:

fãnã̃ [fʌ̃nʌ̃] 'to wither' with **fã̃:nã̃** [fã̃:nã̃] 'to deceive' (142)

	f	ã	n	ã̃		f	ã̃:	n	ã̃
c/s		6	5+	9+			18+	8+	8

In words with length, the medial consonant averages about 40 percent longer than in words without length. The medial consonant is also slightly less lenis in words with length, due to prefinal juncture (see chart 12).

(3) Addition of -V to V:. The addition of the continuative morpheme -V to a monosyllabic verb which is already phonemically long causes the verb to have length in all environments, even before pause where length is usually shortened. The added vowel is the same as the vowel of the preceding stem.

S1. **wi ñ gĩ wá:** [wɪ̃ŋ̃gɪ̃ wá:] 'He threw it.' (143)

S2. **wi i gĩ wá:á** [wɪ:gɪ̃ wá:.] 'He throws it.'

S3. **a wi gĩ wá: lé** [āūgí wá:.lé] 'Did he throw it?'

S4. **a wi i gĩ wá:á lé** [ā wɪ:gɪ̃ wá:.lé] 'Does he throw it?'

The phonetic transcription of these examples shows the shortened length in sentence 1 before pause, indicated here by a colon. This is in contrast to the continuative form of the verb before pause in 2, which in the phonetic transcription is the full length, indicated by a colon plus a period. In the contrast of completive and continuative verb forms in numbers 3 and 4, the phonetic transcriptions show the same length for the verb in both cases where the verb is followed by the clitic **lé**. The continuative aspect morpheme merges with the preceding long vowel to fit within the maximum length of one long syllable. The only place where there is a significant length contrast between verbs of the completive and continuative aspect is where the vowel of the verb occurs before pause.

(4) Nonphonemic length. The conditioning of both long and short vowels which results in nonphonemic added duration has been cited above and in the preceding chapter.

8.2.5 Secondary release of consonants. The secondary release of the initial consonant is a distinctive feature of the word. Its presence may distinguish meanings, and it occurs only once in a basic word. It always occurs on stressed syllables and initially in basic words.

The secondary release feature is frequent, occurring in about one-fifth of all Tyebaara words. In this study it is indicated by the abbreviation CR (Consonant + Release). It takes the form of three variants (Cj, Cw, Cm) which are in complementary distribution: palatalization, labialization, palatals, and nasal-labialization.

(1) Interpretation of secondary release. The above phonetic forms [Cj, Cw, Cm] are interpreted as secondary release of the consonant because:

* They are not syllabic.
* They do not carry separate tone.
* There are no nonsuspicious initial consonant clusters in Tyebaara, and no nonsuspicious vowel clusters in initial syllables. A few vowel clusters are limited to final position in nouns, and are disyllabic vowel clusters (page 156).

* The variants of the secondary release feature occur in complementary distribution and are therefore one phonemic unit.

(2) Restrictions of occurrence. Secondary release occurs with all consonants except with the approximants l, y, w and their nasal alternants [n, ɲ, ŋ]. The phonetic nasal palatal [ɲ] is common in Tyebaara. This, however, is interpreted as the nasal palatal [ɲ] and not as the palatalized n. The nasal velar [ŋ] fluctuates with [ŋ^{w}], and is the nasal form of w. We have found only one occurrence of secondary release with m--in the adjective **mjɛ̃̂** 'all'.

The feature CR may precede any vowel; however, no contrast of CRi:/Ci: or CRu:/Cu: occurs. The phonetic realization of Ci: is always [C^{j}i:] with very slight palatalization. The phonetic realization of labial consonant with u: is [C^{w}u:] with slight labialization. Therefore when CR is concomitant with length plus i or u, the release feature is considered to be predictable and so nonphonemic.

(3) Variants. Other restrictions of variants of the secondary release with certain consonants and vowels occur. They and their distribution are shown in chart 19.

Chart 19

DISTRIBUTION OF THE VARIANTS OF SECONDARY RELEASE

C : labials				alveolars		velars		labiovelars	
CR : pal*		lab*		palatals ~ pal		lab		nas-lab*	
CR	V	CR	V	CR	V	CR	V	CR	V
pj	O, Spr	pw	O, Ro	c**	O/N Spr, Ro	kw	O, Ro	kpm	N, Ro
bj		bw		ɟ**		gw		gbm	
fj	O/N, Spr	fw	O, Ro	š ~ sj					
vj		vw		ž ~ zj					
mj	N, Spr								

* pal = palatalized; lab = labialized; nas-lab = nasal-labialized

** The numerous words containing palatal stops do not have variant forms containing palatalized stops. Only three palatalized alveolar stops have been found. Of these, two fluctuate with palatals: **tiô** [t^{j}ûô ~ cô] 'mouse', and **sĩ̃-diô** [sɪ̃ɖ^{j}ûô ~ sɪ̃ɟô] 'partridge'; and one fluctuates with t and c: **tĩà** [t^{j}ĩà ~ cà] 'hoe with a short handle'.

The CR feature has the following forms:

(a) Spread (palatalized) [Cj] in the following environments:

with alveolar consonants before rounded or spread vowels in words with or without the nasalization feature. With alveolar stops it occurs with or without concomitant length but with fricatives it occurs only with simultaneous length. When it is concomitant with length, secondary release is lengthened and more vowellike. Examples: **tja:** [c^{l}a:] 'to want', **tjábígá** [cábíga] 'river', **sjɛ̃ɛ̃nɛ̃** [š^{l}ɛ̃:nɛ̃ ~

sjɛ̃ːnɛ̃] 'people', **sjɔ̃:** [sɔ̃ː] 'person'. The longer form of the long vowel occurs in disyllabic words, while the shorter variant occurs in monosyllabic words; hence this contrast in the final example.

This variant is written Cj in this study to correspond to the Cy which is written for all palatalized and palatal consonants in current Senoufo literature. However, it should be noted that future Senoufo literature will have the following changes: all words formerly written with ty and dy will be written with c and j. Examples: **tyò** (written here as **tjò**) will be written **cò** 'catch', and **dyoo** (written here as **djo:**) will be written as **joo** 'say'.

Initial CR contrasts with initial C in the following list:

(144)

CR			C		
tjo:lo	[cʲoː lo]	'to belch'	**to:lo**	[toː lo]	'a fall'
tjóró	[cǿřǿ]	'to count'	**tóró**	[tǿřǿ]	'to surpass'
tjírí	[círí]	'to bump'	**tírí**	[tírí]	'descending'
djé:	[ɟˡéː^]	'to wash'	**dé:**	[déː]	'should'
sjɔ:	[šˡɔː]	'to buy'	**sɔ̃:**	[sɔ̃ː]	'to be clogged'
zjà:rà	[žˡàːřà]	'bird nest'	**zã:nằ**	[zãːnằ]	'epilepsy'

with labial consonants only before spread vowels. The release feature occurs with bilabial stops only preceding oral vowels, but with labiodental fricatives it occurs preceding oral and nasal vowels. When occurring with labial consonants preceding the spread vowels, secondary release takes the form of palatalization and is generally more vowellike than when occurring with alveolar consonants. It is difficult to distinguish presence or absence of the feature of length with palatalized labial consonants because palatalization spreads over part of the long vowel and adds length to the syllable with the short vowel. Examples of initial CR and initial C:

(145)

CR			C		
pje	[pʲɛ̄]	'to do'	**pe:**	[pɛ̄ː]	'to be bad'
bjà	[bʲà]	'sheep'	**ba**	[bā]	'come' (aux)
fjãa	[fʲãːˀ]	'fish' (sg)	**fàala**	[fàːˀlā]	'fish' (pl)
fjà:lá	[fʲàːlá]	'hurry' (ct)	**fálá**	[fálá]	'to cultivate'
fjɛ̃:rɛ	[fʲɛ̃ːřɛ̄]	'blossoms'	**fɛ̀:rɛ̀**	[fɛ̀ːřɛ̀]	'shame'

(b) Rounded (labialized) [Cw] in the following environments:

with labial and velar consonants only before back rounded vowels, and only with oral vowels, and only concomitant with length. The labialized secondary release is also more vowellike. It begins with labialization of the consonant and continues as a rounded transition towards the articulation of the vowel. Initial CR contrasts with initial C in example 146.

(146)

	CR			C	
pwɔ:	[p^{w}ɔ̄:]	'to tie'	**pɔʔɔ**	[pɔ̄ʔɔ̄]	'to heal'
bwɔ̄:	[b^{w}ɔ̄:]	'log seat'	**bɔ̄lɔ̄**	[bɔ̄lɔ̄]	'funeral rite'
fwō:	[f^{w}ō:]	'roasting'	**fo:**	[fō:]	'astonish'
yā-gwɔ̄:	[yàg^{w}ɔ̄:]	'only'	**kà-gɔlɔ̄ na**	[kàgɔ̄lɔ̄ na]	'aside'
kwō:	[k^{w}ō:]	'finishing'	**kō:**	[kō:]	'to draw water'

(c) Nasal rounded (nasalized and labialized) [Cm] in the following environments:

with labiovelars only before back rounded vowels concomitant with nasalization, i.e., only before ɔ̄. It occurs both with and without length. With the secondary release feature, the release of the labial part of the labiovelar becomes [m], so it is phonetically [kpm] and [gbm].

The articulation of kpm and gbm begins like the articulation of kp and gb: by simultaneous closure of the lips and back of the tongue against the soft palate with resultant suction between the two closures. But unlike kp and gb where both closures open simultaneously, the closures of kpm and gbm do not open simultaneously. The velar closure, k or g is released first, and the nasal passage is opened while the lips remain closed. This results in a release of air through the nasal passages while the lips are still closed and continued heavy nasalization after the lips are opened to voice the vowel. Initial CR and initial C contrast in example 147:

(147)

	CR			C	
kpmɔ̄:nɔ̄̌	[kpmɔ̄:ˆnɔ̄̌ˆ]	'cooking stone'	**kpɔ̄̌**	[kpɔ̄̌]	'Fɔ̄nɔ́ men's society'
kpmɔ̄̌ʔɔ̄nɔ̄	[kpmɔ̄̌ʔɔ̄nɔ̄]	'cooking stones'	**kpɔ̄ʔɔ̄nɔ̄**	[kpɔ̄ʔɔ̄nɔ̄]	'to swell'
fà-gbmɔ̄̃:	[fàgbmɔ̄̃ː]	'rice-field weeder'	**gbɔ̄̌**	[gbɔ̄̌]	'baboon'
kà-gbmɔ̄nɔ̄gɔ	[kàgbmɔ̄nɔ̄gɔ̄]	'prop for pot on fire'	**gbɔ̄̌bēlē**	[gbɔ̄̌bèlē]	'the baboons'
kpmɔ̄:rɔ̄	[kpmɔ̄:ɾɔ̄]	'a beating'	**kpɔ̄**	[kpɔ̄]	'Kong' (name of town)
nɔ̄̀-gbmɔ̄̃:ɔ̄	[nɔ̄̀gbmɔ̄̃ː]	'herb doctor'	**gbɔ̄̌ɔ̄nɔ̄**	[gbɔ̄̌ːnɔ̄̃]	'baboons'

(4) Length in relation to secondary release. The secondary release feature is realized as longer when it is concomitant with length than when there is no length feature. When extra nonphonemic length is added for emphasis of these words, both the secondary release and the vowel are lengthened even more.

(148)

	normal		with emphatic stress	
tjɛ̄:rī	[cˡɛ̄:ɾī]	'a little'	[cī.ɛ̄::ɾī]	'a little'
sjɛ̄̌ɔ̄nɛ̄	[šˡɛ̄̌ːnɛ̄]	'people'	[šī.ɛ̄̌ː:nɛ̄]	'people!'

(5) Vowel and consonant variants in relation to secondary release. When secondary release is concomitant with length, lower mid and higher mid spread vowels are higher and more fronted. Examples: **tjē:** [cˡēˆ:] 'to refuse', **fjɛ̃ʔɛ̃** [fʲɛ̃ʔɛ̃ˆ] 'caterpillar'. These variants begin more like [i] but end with the higher [eˆ] or [ɛ̃ˆ] quality. The secondary release feature also fronts and raises ɔ when the second consonant is an alveolar. Example: **tjɔ̃nɔ̃:** [cɔ̃nɔ̃:] 'younger brother'.

Secondary release affects the consonants with which it occurs in the following ways:

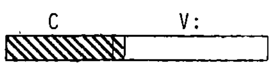
* Bilabials tend toward spirantization preceding spread vowels, although the lips completely close at the beginning before the secondary release begins. Example: **pjè:rī** [pʲè:ř̄ī] 'to be quiet'.
* Labiodentals have more friction from the beginning with the palatalized variant of secondary release than without the secondary release. Example: **fjā:** [fʲā:] 'to fear'.
* Labiovelars are affected by the nasalization of the labial part of the double stop. Example: **kpmɔ̃:** [kpmɔ̃:] 'to hit'.
* Alveolars with secondary release tend toward a more palatal position, with the following variations:

  1. more fronted, almost prepalatal, before front long vowels. Example: **tjɛ̄:** [cˡɛ̄ˆ:] 'to choke, groan';

  2. a more palatal position before front short vowels and before back long vowels. Examples: **tjeri** [cēřī] 'to cut in two', **tjɔ:lɔ** [cʲɔ̄:lɔ̄] 'to cascade', **sjɔ:** [šʲɔ̄:] 'to buy'.
* Consonants and vowels seem to be slightly shortened where secondary release is concomitant with length, but the total length of the syllable is the same. This is shown in the following diagram:

1. 

with the secondary release feature and length feature (149)

2. 

without the secondary release feature, but with the length feature

Key: C  R 

(6) Elision of the secondary release feature occurs in some stems in derived basic words as well as in expanded and compound words:

basic	basic	expanded	compound	(150)
bjā	**bāala**	**bāŵ**	**bā-pīlē**	
'sheep' (sg)	'sheep' (pl)	'the sheep' (sg)	'lamb'	

8.2.6 Glottalization is a distinctive feature, occurring only once in a basic word. It occurs always word initially in a stem consisting of a long syllable. It is realized as a glottal stop between two identical vowels.

Glottalization is phonemic since its presence or absence differentiates words as to meaning. The following lists show contrasts of words with and without glottalization:

with glottalization		without glottalization (151)	
sɛ̃ʔɛ̀	'to limp'	**se:**	'to give birth'
nyɛ̃ʔɛ̃rī	'to sting, burn'	**nyɛ̃:rī**	'to pray'
tąʔą	'to set on'	**tą:**	'to get, gain'
tã̀ʔã́	'to walk'	**tã̀gá**	'to touch'
bàʔà	'to be unjust'	**bàgà**	'pond'
gboʔo	'a large pile'	**gbṍgó**	'a bucket'
gbòʔò	'leather bag'	**gbó:**	'to carry on back'
tɔʔɔ	'to catch'	**tɔ̃:**	'really'
fòʔò	'to bump into'	**fò:**	'python'
fɛ̀ʔɛ̀	'to forget'	**fɛ:**	'to blow'
kpɛ̀ʔɛ̀lɛ̀	'stir up fire'	**kpɛ̀:lɛ̀**	'a cane, staff'

(1) Interpretation of glottalization. Glottalization is considered to be a feature of the word for the following reasons:

* It occurs only between identical vowels.
* The vowels on each side of the glottal stop, although having short duration, have the quality of long vowel variants. Therefore the whole sequence CVʔV cannot be interpreted as CVCV. Rather it must be considered as a long syllable carrying the simultaneous feature of glottalization: /ʔCV:/.
* This is further confirmed by the fact that many words with glottalization have long allomorphs without the glottalization feature. For example:

with glottalization		**without glottalization**		(152)
tã̀ʔã́	'to walk'	**tã̀:rī**	'walking'	
kpaʔa	'house'	**kpà:gī**	'the house'	
kpɔ̀ʔɔ́	'to be large'	**kpa:-kpɔ̀:gī**	'the large house'	

* While other consonants occur word medially after a long syllable, the glottal is never heard after a long vowel; i.e., ***ta:ʔa** never occurs in Tyebaara words while **tã̀:gá** does occur, meaning 'to be isolated'. Also, the glottal stop does not occur syllable initially. It does not contrast with the other consonants in initial position except as noted below.

(2) Distribution of glottalization. Glottalization occurs as an interruption of all long vowels except the high close vowels i: and u:. In basic words it always occurs in an initial long rhythm unit.

(3) A glottal stop variant of g occurs in a few nouns following a long rhythm group: **kolo?ō ~ kologō** 'road'. This is a free variant and is not the feature of glottalization. It occurs in certain environments, usually as the consonant of the indefinite suffix of a noun and sometimes also in verbs.

A nonphonemic glottal stop also occurs before an initial vowel in a sentence. When the same word occurs in the middle of the sentence, the glottal stop is elided.

	a mɔ kárí lé [?ā mɔ̄ kárílé]	'did you go?'	(153)
	àba: [?àbā:]	'dad, son'	
	ɛ̄?e [?ɛ̄?ē]	'no'	
	ābé: gi nyɛ [?ābé: gɪ̄ ɲɛ̃]	'like that it is'	
but	**ki i nyɛ ābé:** [kī: ɲɛ̃ ābé:]	'it is like that'	

(4) Nonglottalized variant of the glottalized long vowel. Glottalization is elided in many stems, mostly in basic-derived words and in complex words, and sometimes in nonderived basic words. Elision of features such as glottalization and secondary release of consonants occurs more often in derived and complex forms. However, elision may sometimes fluctuate between speakers or in the speech of the same speaker. Another type of elision is the elision of stem medial consonants: **bēeo ~ bēleo** 'spider'.

basic		complex		(154)
nonderived	derived	expanded	compound	
kpa?a 'house'	**kpā:lā** 'shelter'	**kpā:gī** house-the 'the house'	**kpa:-ta?aga** house-stack 'multistory house'	
tā?ā́ 'to walk'	**tā:rī** 'walking'	**tā?ā́nɪ̄** walk-the 'the trip'	**kô-dā?ā́gā** road-walk 'roadway'	
fɔ̄?ɔ́ 'to rot'	**fɔ̄:rī** 'rotting'	**kɔ̄?ɔ́rī** play-the 'the playing'	**ya-fɔ̄?ɔ́rɔ́** thing-rot 'rotteh thing'	
nyàa ~ ŋà?a 'grass'	**kɔ̄?ɔ́rɔ̄** 'playing' (n)	**nyàawā:gī** grass-dry-the 'the dry grass'	**nyàa-wa?a** grass-to dry 'dry grass'	

8.2.7 Nasalization is a distinctive feature whose presence or absence determines meanings of words. It is not a derived feature. It begins on the stressed nucleus of a word and extends over the entire word unless occluded by some stop consonants (page 151f.). In noun compounds, nasalization in a first nucleus may affect the consonant of the second nucleus, causing voiceless consonants to become voiced (page 175).

In the other sections of this volume, nasalization is marked by a tilde over the vowels and by the notation of the nasal variants of the approximants: **nãɔ̃** 'man', **nyɔ̃:** 'to be good', **ŋɔ̃** 'to breathe'. In this

section, however, the examples are written first phonemically, according to a feature notation reflecting our analysis, and then phonetically. A superscript n indicates nasalization in the phonemic transcription. The following words contrast as to presence or absence of the nasalization feature.

with nasalization			without nasalization			(155)
^{n}ta?a	[tã?ã]	'to be angry'	**ta?a**	[tã?ã]	'to set'	
^{n}sɔ̃:	[sɔ̃:]	'to incite'	**sɔ̃:**	[sɔ́:]	'to clog'	
^{n}nyala	[ɲɛ̃nɛ̃]	'horn of animal'	**yala**	[yɛ̄lɛ̄]	'to be right'	
^{n}sĩ	[sɨ̃]	'to be straight'	**sĩ**	[sĩ]	'even, so'	
^{n}tjúgó	[cṹgó]	'to agitate'	**tjúdó**	[cúřó]	'to be crazy'	

Nasalization affects both consonants and vowels. As can be seen in the examples above, it extends over more than one syllable when there is no occlusion such as a stop consonant word medially.

(1) Consonant variants in relation to nasalization. The feature of nasalization is realized on consonants in the following ways:

(a) Initial consonants of basic words are more fortis with a more tense release when the word is nasalized than when it is not. Initial nasalized voiceless stops and fricatives have heavy nasal aspiration upon their release, as in:

with nasalization			without nasalization			(156)
^{n}tĩ	[t^{n}ɾ̃]	'to swell'	**ti**	[t^{h}ĩ]	'it' (very light aspiration)	
^{n}sĩ	[s^{n}ɾ̃]	'to be right'	**sĩ**	[sĩ]	'even'	
^{n}bã	[bã̂]	'it is not'	**ba**	[bā]	'come' (aux vb)	

(b) In a two-syllable long rhythm unit, the consonant release is less strong than in a one-syllable word with nasalization because the nasalization spreads out over the two syllables. Compare: **^{n}sĩ** [s^{n}ɾ̃] 'to be right, straight' and **^{n}sĩlã** [sĩnɛ̃] 'to lie down'.

(c) In a long rhythm unit of one syllable which bears the feature of length, the fortisness of the consonant release associated with nasalization is neutralized by the lenisness of the consonant associated with length. Compare the following examples:

						(157)
^{n}fã	[f^{n}ã̂]	'to run'	**^{n}fa:**	[fã:]	'to build'	
^{n}sã	[s^{n}ã̂]	'where'	**^{n}sa:di**	[sã:řī]	'to iron'	

(d) The following consonants are phonemes, contrasting in word initial position in oral environment:

					(158)
/l/ - /n/	**lã:**	'to take'	**nai**	'fire'	
/y/ - /ɲ/	**yã:**	'to be ill'	**ɲàa** (written **nyãa**)	'grass'	
/w/ - /ŋ/	**wɔ̃gĩ**	'the rainy season'	**ŋɔgi**	'shooting' (arrow)	

Although these oral and nasal consonants do not contrast in a nasal environment, initial nasal consonants occur in oral and nasal environments:

/n/	**nĩgĩ**	'to dip'	**nĩ̃gè**	'a root'	(159)
/ɲ/	**ɲa:** (**nya:**)	'to see'	**ɲã:** (**nyã:**)	'weeping'	
/ŋ/	**ŋɔgi**	'shooting'	**ŋɔ̃gĩ**	'breathing'	

(e) In word medial position, the following nasal variants occur:

/l/ [n] stem medially or suffix initially: (160)

ⁿtɔlɔ [tɔ̃nɔ̃] 'to become tall or long'

/g/ [ŋ ~ g] only stem medially in fast speech:

ⁿtãgã [tãŋã ~ tãgã] 'to touch'

Nasal variants of /y/ and /w/ do not occur word medially in the Tyebaara dialect. However, in some other dialects--Teneri of Boundiali for example--/w/ is realized as /ŋ/ in the suffixes of the **wii** semantic class of nouns: Tyebaara **nãw̃** 'the man' is **nãñ** in Teneri.

(f) /b/ and /m/ are phonemes contrasting in word initial position in nasal environments:

/b/ [b] **bã̃** 'it is not' (161)

/m/ [m] **mã̃-dêgè** 'corn'

However, the contrast between /b/ and /m/ is neutralized in word medial position:

/b/ occurs medially only in words without nasalization

/m/ occurs only in nasal environments.

Alternate oral and nasal forms of some Tyebaara words reflect the neutralization of /b/ and /m/ word medially:

ⁿsibele [sĩmãnã] ~ **sibele** [sibele] 'to squat' (162)

(g) Nasalization extends across morpheme boundaries: the noun semantic class suffix -lV is realized as -nV following a nasalized noun stem. The period indicates morpheme boundaries in these examples:

ⁿŋɔ.lɔ	[ŋɔ̃nɔ̃]	'knife'	**kò.lò**	[kòlò]	'chair'	(163)
ⁿmɛ:.la	[mɛ̃:nɛ̃]	'rope'	**là.là**	[làlà]	'time'	

(h) Nónphonemic nasalization may begin with the unstressed consonant of the suffix or other particle and extend across the syllable progressively. When the initial consonant of a noun suffix is a phonemic nasal /m/, there is no regressive assimilation; the preceding stem may be oral or nasal.

mĩ:.mã	[mĩ:mã̃ˆ]	'flour'	**solo.mɔ̃**	[sǒlǒmɔ̃]	'salt' (164)
ⁿti:.mã	[tĩ:mã̃ˆ]	'medicine'	**yé-bili.mã̃**	[yébīlīmɛ̃]	'darkness'

However, nasalization does not stretch across stop consonants at morpheme boundaries, unless the stop consonant is realized as a nasal variant:

ⁿ**nī.gè** [nɨ̃̀ŋgè ~ nɨ̃̀ŋɛ̃̀] 'root' (165)

but ⁿ**nī.rè** [nɨ̃̀ř̃è] 'roots'

(2) Vowel variants in relation to nasalization. Nasalization is associated with the more centralized vowel variants. Nasal variants of the lower vowels are higher than the oral variants, and the nasal variants of the higher vowels are lower and more centralized than are the oral ones. Throughout this section in the transcription of each example, the suffix is separated from the stem by periods.

When the nasalization feature co-occurs with the length feature, nasalization does not affect the quality of the long vowels; they retain their cardinal vowel quality.

All vowels except e and o may be nasalized. The high mid vowels do not occur concomitant with the feature of nasalization in basic words. This is confirmed in noun morphology:

* when the vowel stem is i, the suffix vowel is e, except when nasalization occurs, whereupon the suffix vowel is ã as in:

  ⁿ**ti:.la** [tĩ̄:nɛ̃̄] 'pole' **lì:.lè** [lì:lè] 'food' (166)

* when the stem vowel is u, the suffix is o, except when nasalization occurs, whereupon the suffix vowel is ɔ̃ as in:

  ⁿ**su.lo** [sũ̄nɔ̃̄] 'blood sacrifice' **sú.gō** [súgō] 'mortar' (167)

* when the noun occurs in two or more concord classes, the suffix consonant may be a stop in one class, and a continuant in another. When the suffix consonant is elided or is a continuant or a fricative, the nasalization extends to the suffix vowel, and the higher mid close vowels are replaced by lower mid open vowels:

  ⁿ**tu-ⁿdu.ro** [tũ̂dũ̄ř̃ō] 'message' ⁿ**tu-ⁿdu.ɔ** [tũ̂dũ̄ɔ̃̄] 'messenger' (168)

  ⁿ**ŋúlú.gō** [ŋũ̄nṹgō] 'song' ⁿ**ŋū:.mɔ̄** [ŋũ̀:mɔ̃̀] 'singing' (n)

  ⁿ**nì.gè** [nĩ̀ŋgè ~ nĩ̀ŋɛ̃̀] 'root'

This is also confirmed in nouns or verbs when alternant oral and nasalized forms occur (see example 162).

Apparent exceptions to the absence of nasalization on e and o are due to the following:

* vowel assimilation to a preceding high vowel in which the lower mid vowel ɔ̃ becomes higher but remains open; it is not closed [õ.]:

  tū-dū.ɔ̄ [tũ̄dũ̄ɔ̃̂] 'messenger' **fű:.ɔ̃́** [fű̃:ɔ̃̄ˆ] 'blind person' (169)

* the nasalization which is on the noun stem may stop short of the vowel e: of the demonstrative suffix. The demonstrative suffix follows the definite suffix which is represented by a consonant only, the vowel being elided.

ya-ⁿsá.l̀.lè: [yāsā̃ǹlè: ~ yāsā̃ǹ:è: ~ yāsā̃ǹ:ɛ̃̀:] 'that fruit' (170)
(thing-bear fruit-the-that)

In the first of the three variants, nasalization progresses only through the consonant of the definite suffix and not through the consonant of the demonstrative suffix; in the second, nasalization progresses through the consonant of the demonstrative suffix but not through the vowel since the e: is oral and not nasal; in the third, nasalization progresses through the vowel of the demonstrative suffix, and the e is replaced by ɛ̃:.

Extrasystemic words are employed in some stories to represent the different kinds of speech of nonhuman actors in the story. These may contain ẽ's and õ's, as in **tẽ̃ndẽ̃ñdẽ̃ndẽ̃ñ** and **tyõ̃ngo**. These are employed for effect to elicit laughter from the auditors.

(3) Interpretation of nasal consonants. A contrast is perceptible between degrees of nasalization of vowels immediately following nasal consonants. This raises the question of the interpretation of the nasal consonants. Two interpretations are possible, with reasons in favor of each: the nasal approximant consonants are either nasal variants of the oral consonants l, y, and w, and the degrees of nasalization of contiguous vowels are predictable by environment, or they are phonemic and may be followed by nasal or oral vowels.

(a) Nasal variants of oral consonants. That nasal consonants are variants of the oral consonants l, y, and w was probably diachronically correct, for the following reasons:

* No contrast is heard between degrees of nasalization of vowels following oral consonants.

* No nasal vowel occurs following l, y, and w, as is evident from alternant oral and nasal forms of the same words:

nũgó	~ **lũgó**	'to get back'	**nũgù**	~ **nũ̀gò**	'to filter' (171)
nyĩnĩ	~ **yili**	'to go out'	**nyĩnĩ**	~ **yiri**	'to go out'

* Tyebaara speakers differ as to degrees of nasalization on some words. For example, to some the nasalization is the same on **mɔ** 'you' (sg) and on **ⁿmɔ** 'to be a long time'.

* The heavy and light degrees of nasalization of vowels following nasal consonants are predictable in the following environments:

Heavy nasalization occurs on one-syllable short stems. In the following examples, grammatical juncture is indicated by a period following the stem. Heavy nasalization is indicated by a tilde in the phonetic transcription: (172.1-14)

1. **ⁿna** [nã̃] 'arrive' 2. **ⁿmɔ** [mɔ̃̀] 'to be a long time'
3. **ⁿnĩ.gê** [nĩ̃ŋgè] 'root' (n) 4. **ⁿnya.ga** [ɲã̃ŋgā] 'to cause to dry' or 'to melt'

Light nasalization occurs in all other environments, i.e., in nonstems, suffixes, disyllabic stems, and monosyllabic long stems which have long vowels. Light nasalization is not marked:

5. **na**	[nā]	'on'	6. **mɔ**	[mɔ̄]	'you' (sg)	
7. **nígí**	[nígí]	'immerse'	8	**ŋɔri**	[ŋɔ̄ří]	'to nurse' (a baby)
9. **ma:**	[mā:]	'coming'	10.	**mɛ́ʔɛ́**	[mɛ́ʔɛ̄]	'name'
11. **nɔ:ri**	[nɔ̄:ří]	'skewer' (v)	12.	**nyãa**	[ɲãː]	'grass' (underlying form is **nyãʔa**)

A very few exceptions occur, and most of these are predictable from the underlying forms. These are disyllabic stems whose medial consonant l has been elided but which carry the tenseness of the elided consonant in the remaining vowels. This tenseness occurs also in oral stems in which the lateral has been elided, and causes voicing of the initial consonant of the following component in a compound word: **kologõ** 'road' + **pílé** 'small' is **ko-bilé** 'path' (page 175). The tenseness caused by the lateral, and the tenseness caused by nasalization combine to result in seemingly heavier nasalization. In the following examples, the stem is followed by a period; an asterisk indicates a reconstructed form.

13. **ⁿmɛ:.la**	[mɛ̃:nɛ̃] 'cord'	14. **ⁿnyã:.**	[ɲãː] 'weeping' (v)
ⁿmala.ga	[mɛ̃nɛ̃gɛ̄] 'large rope'	**ⁿnyali.**	[ɲɛ̃nĩ] 'to weep'
***ⁿmala.la**	[mɛ̃nɛ̃nɛ̃] 'cord'	***ⁿnyali.la**	[ɲɛ̃nɛ̃nɛ̃] 'weeping' (v)

The two n's in successive nonstressed syllables are not pleasing to the ear and one or both would be eliminated.

The n is elided in similar examples: **ñdɔ̃́nɔ́** 'head cover' + **tɔ̃nɔ̃** 'to be long' becomes **ñdɔ̃́-dɔ̃́:nɔ̃́** 'tall hat' rather than the expected reconstructed form ***ñdɔ̃́-dɔ̃́nɔ̃́nɔ̃́** (hat-long-suf). The ñ's are both elided in the following example. The infinitive form is given first since it is the form on which the progressive is built: **ⁿtálá** [tɛ̃́nɛ́] 'to be sweet', **tã:** [tã̌:.] 'becoming sweet'; the reconstructed form is ***tànànà** [tɛ̀nɛ̃nɛ̃].

(b) Nasal consonants are phonemic. The interpretation that nasal consonants are phonetic is valid if we disregard the underlying forms of contrasting words such as **nyã:** 'weeping' (no. 14 above) and **nyãa** 'grass' (no. 12). The very few forms which do contrast in this way would then lead to an interpretation of the nasal consonants as phonemic.

A supportive factor for this interpretation is that the language is changing, and that Tyebaara forms are becoming shorter. This would presumably give more shortened forms in the future for which one would need to seek underlying forms in order to define the environment in which the words occur.

The fact that m and b contrast word initially but not word medially supports the interpretation that n, ɲ, and ŋ contrast initially but not medially with l, y, and w. However, as was indicated above, nasal vowels never occur following l, y, or w, whereas they do occur following b. Nevertheless, I have chosen to interpret the nasal consonants as phonemes because of the contrasts existing in the language as spoken today. Underlying forms have not been found for some words, which would explain the difference between lightly and heavily nasalized vowels following nasal consonants, even though they may be suspected of having existed historically.

Chart 20

VOWEL SEQUENCES IN DISYLLABIC WORDS

V_1 V_2	i	ĩ	e	a	ã	ɔ	ɔ̃	o	u	ũ
i	x		x	x	(x)			[x]		
i:	x		x	x	(x)			[x]		
ĩ	/x/	x	/x/		x		[x]			
ĩ:	/x/	x	/x/		x		[x]			
e	x		x		(x)			[x]		
e:	x		x		(x)			[x]		
ɛ:	x			x	(x)	[x]				
ɛ̃:	/x/	x		/x/	x		[x]			
a	x			x	(x)	[x]				
a:	x			x	(x)	[x]				
ã	/x/	x		/x/	x		[x]			
ã:	/x/	x		/x/	x		[x]			
ɔ	x					x	(x)			
ɔ:	x					x	(x)			
ɔ̃	/x/	x				/x/	x			
ɔ̃:	/x/	x				/x/	x			
o	x						(x)	x		
o:	x						(x)	x		
u	x					x	(x)	x	x	
u:	x						(x)	x	x	
ũ	/x/	x					x	/x/	/x/	x
ũ:	/x/	x					x	/x/	/x/	x

Symbols: (x) only in **pii**-class noun suffix -mV

/x/ only in nasalized word after medial stop consonant /d/ [ř] or /g/

[x] only in **wii**-class noun suffix -V

x elsewhere

The vowels /a/ and /ã/ of the second syllable have the phonetic variants [ɛ ~ ʌ ~ aˆ] and [ɛ̃ ~ ʌ̃ ~ ãˆ] according to the rules given above.

8.2.8 Vowel distribution is a demarcative feature which acts as a cohesive factor in the basic word. The disyllabic basic word is limited to three patterns of vowel sequences, and the trisyllabic basic word is limited to six patterns. The nouns of the **wii** class comprise an important exception, due to the reduced suffix consisting of a rounded back vowel rather than the usual suffix of -CV (page 158). Other seeming exceptions are not basic words, but are expanded or compound words.

(1) Vowel sequences in basic words. The rules given below define the distribution of vowels in disyllabic words. The two syllables may contain the following vowel sequences:

(a) identical vowels, CVCV: **kara** 'to litter';

(b) only spread vowels or only rounded vowels, of which V_1 is a high close vowel; Spread/Round [CiCV/CuCV]: **kĩrà** 'a foot ailment'; **kũlõ** 'far region';

(c) any vowel, spread or rounded, followed by i; [CVCi]: **kãrĩ** 'to go', **kõrĩ** 'to nail'.

In chart 20, V_1s are listed in the vertical columns, and V_2s in the horizontal rows.

(2) Restrictions of vowel sequences. Vowel sequences for trisyllabic words are the same as for disyllabic words, with the following variations:

(a) identical vowels: CVCVCV

(b) all spread or all rounded, with the V_1 and V_2 high close vowel and V_3 mid vowel; nasal vowel in nasal suffix, or oral vowel in oral suffix: Spread/Rounded [CiCiCV/CuCuCV]

(c) all spread or all rounded, with V_1 high close vowel and V_2 and V_3 lower vowels which are identical with each other: Spread/Rounded [CiCVCV/CuCVCV]

(d) the first two syllables as in (c), C_3 is i [CiCVCi/CuCVCi]

(e) C_1 and C_3 identical, and C_2 is i: CVCiCV

(f) C_1 and C_2 identical, and C_3 is i: CVCVCi.

Examples of disyllabic and trisyllabic words in the list below are numbered according to the numbered rules given above. Of the nouns, only the indefinite singular form is included among basic words to which these rules apply. The other forms of the noun, such as the definite and the plural are not subject to the above restrictions because they are expanded words (page 163ff.). For example, the sequence CVCiCi may occur in the definite noun form but not in the indefinite form: **tjerĩgĩ** 'the piece' (definite form), **tjerige** 'piece' (indefinite or generic form). In a plural form an e may occur after ã because the plural form is an expanded word:

expanded	basic	(173)
nãbele 'men'	**nãȁ̃** 'man'	
(indefinite plural form)	(indefinite singular form)	

disyllabic words

1. **Identical Vowels**
   - **pārā** 'to sell'
   - **lūgū** 'to climb'
   - **tjōrō** 'to count'
   - **tē:lē** 'cockscomb'
   - **pɔ̃ɔ̃̀** 'dog'
   - **tɔ̃nɔ̃** 'to be long'
2. **High - Lower Vowel**
   - **sĩgi** 'to wait'
   - **sĩmã** 'oil'
   - **kũrɔ́** 'to wrinkle'
   - **sũnɔ̃** 'animal sacrifice'
   - **kùlò** 'foreign country'
   - **sĩ̃nã̄** 'to lie down'
3. **Lower - High Spread Vowel**
   - **tjeri** 'to cut in two'
   - **kórĩ** 'to nail'
   - **kárĩ** 'to go'
   - **tjɔ̃:ri** 'to sort out'
   - **pũ̃:nĩ̀** 'to be lost'
   - **sã̀mĩ̀** 'to warn'
   - **kabi** 'to break'

trisyllabic words

1. **Identical Vowels**
   - **paraga'** hatred'
   - **mĩrĩgĩ** 'to sink into'
   - **tjõlõgõ** 'to be healthy'
2. **High - High - Lower Vowels**
   - **pĩrĩgê** 'to mix'
   - **tjurugo** 'to be mixed up, anxious'
3. **High - Lower - Lower Vowels**
   - **sigele** 'waiting' (n)
   - **tĩ̃mãnã̄** 'to measure'
   - **pulorò** 'slavery'
4. **High - Lower - High Spread Vowels**
   - **tjũrõgĩ** 'becoming crazy'
   - **sĩ̃nãgĩ** 'making lie down'
5. **Lower - High Spread - Lower Vowels**
   - **tjerige** 'a piece'
   - **tõrigõ** 'to send'
   - **gɔ̀rĩrɔ̀** 'cotton'
6. **Lower - Lower - High Spread Vowels**
   - **sã̄mã̄gĩ** 'repairing'
   - **tõrõgĩ** 'sending'
   - **kabagi** 'breaking' (plv)

Derived forms adjust to the vowel sequence patterns when necessary. For example, there is no pattern L - HS - HS (lower - high spread - high spread vowels). Therefore, when a suffix is added to a disyllabic word whose vowel sequence plus the suffix vowel would result in an unacceptable vowel sequence, the stem vowel is changed in order to adjust the resulting trisyllabic word to the acceptable vowel sequence pattern. The affected vowel is underlined in the following:

tõrigõ 'to send' + **-gĩ** (continuative) = **tõrõgĩ** (not ***tõrigĩ**) (174)

kabi 'to break' + **-gi** (plural) = **kabagi** (not ***kabigi**)

sẽlĩ 'to begin' + **-gĩ** (continuative) = **sẽlẽgi** (not ***sẽligi**)

The specific restrictions by which the vowels of the basic word are determined are listed in chart 21. These show that the vowels of the entire word must either be identical, or that if they are not identical, one of the vowels must be a high close vowel. The vowels must be all spread vowels or all rounded vowels. An exception to this is the vowel i, which may occur in the second or third syllable in a word with rounded vowels.

Chart 21

RESTRICTIONS OF VOWEL DISTRIBUTION IN BASIC WORDS

(a) DISYLLABIC WORDS

Restrictions	V_1	V_2
1. Identical	V	V
2. H - L	H Spr	Lower Spr
	H Ro	Lower Ro
3. L - H Spr	L Spr	H Spr
	L Ro	H Spr
H - H Spr	H Ro	H Spr~Ro

(b) TRISYLLABIC WORDS

	Restrictions	V_1	V_2	V_3
1.	Identical	V	V	V
2.	H - H - L	H Spr	H Spr	L Spr
		H Ro	H Ro	L Ro
3.	H - L - L	H Spr	L Spr	L Spr
		H Ro	L Ro	L Ro
4.	H - L - H	H Spr	L Spr	L Spr
		H Ro	L Ro	H Spr
5.	L-HSpr-L	L Spr	H Spr	L Spr
		L Ro	H Spr	L Ro
6.	L-L-HSpr	L Spr	L Spr	H Spr
		L Ro	L Ro	H Spr

The lower vowel signifies lower than the high close vowel, i.e., it can be e, a, o, ɔ. In trisyllabic words, the two vowels with the same symbols are identical vowels, i.e., LRo - LRo - HSpr would be o-o-i, for example, and not o-ɔ-i, and L-HSpr-L could be o-i-o, but not o-i-u; or it could be e-i-e, but not a-i-e. It is to be noted that the high spread vowel i can occur as the different vowel in any position, as V_1, V_2, or V_3, but the high rounded vowel u can occur as the different vowel only in initial position as V_1. When the high spread vowel occurs as the different vowel in initial position, it is restricted to words with all spread vowels; but when it occurs in the V_2 or V_3 position, it may occur with spread or rounded vowels. One may conclude that spreadness or roundness is a feature of the basic word and that the occurrence of i in V_2 or V_3 position is an exception to that rule. Very often in rapid speech, the i in V_2 or V_3 position is elided or is very short.

(3) Noun suffix -o ~ -ɔ exception. An important exception to the restrictions of vowel distribution occurs in the indefinite form of the **wii** class of nouns (see concord class in chart 7). In the generic or indefinite form of the **wii**-class nouns, the final vowel may be a back rounded vowel, even when the preceding ones are spread. These exception-

al sequences are marked as [x] in chart 20. Although they do not follow the restrictions for rounded/spread vowels, the vowel sequences for this **wii** class have the following restrictions:

/o/ occurs as the suffix vowel when the vowel of the contiguous stem is close spread or close rounded (the suffix vowel is underlined in the following examples):

bēeo	[bēˀō]	'spider'	(175)
wo-vi:-o	[wōvī:ō]	'white one'	
sjɛ̃:-lóˀóō	[šˡɛ̃.lóˀóˀ]	'listener'	
kū-sūlūō	[kūsūlūō]	'mediator'	

/ɔ/ occurs as the suffix vowel when the stem vowels are open spread or open rounded:

tē-fālāɔ̄	[tēfālāɔ̄]	'cultivator'	(176)
dɛ̄:ɔ̄	[dɛ̄:ɔ̄]	'sorcerer'	
tjɔ:lɔɔ̄	[cʲɔ̄:lɔ̄ˀ]	'funnel'	

/ɔ̃/ occurs as the suffix vowel following stems which have the feature of nasalization:

nã̀ɔ̃̀	[nã̀ɔ̃̀]	'man'	(177)
fū̃:ɔ̃	[fū̃:ɔ̃́]	'blind person'	
nĩ̀-gbɛ̃̀:ɔ̃̀	[nĩ̀gbɛ̃̀:ɔ̃̀]	'bachelor'	
tjɔ̃nɔ̃ɔ̃̀	[cɔ̃̀nɔ̃ˀ]	'younger sibling'	

In the other nongeneric and nonindefinite forms of nouns of the **wii** class, the singular suffixes are **-w** or **-wV**; therefore, a reconstruction of the **wii** class indefinite suffix gives ***-wV.** It is assumed the vowel and w have coalesced to a back rounded vowel. A reconstructed suffix of **nãɔ̃** would be ***nã̀wã̀**, for example.

In the other four noun classes, the suffixes for indefinite singular forms of nouns are realized as -CV:

1. the **kii** class manifests a **-gV** suffix, e.g., **nyũ̀gō** 'head', or a glottal stop stem medially when the stem vowel is long, e.g., **kpa:** (stem) = **kpaˀa** 'house' (indefinite form);
2. the **lii** class manifests an **-lV** suffix (**-nṼ** in nasalized nouns): **lī:lē** 'food', **mɛ̃:nɛ̃** 'cord';
3. the **tii** class manifests **-dV** [řV] suffixes: **po:ro** 'mud';
4. the **pii** class manifests a **-mṼ** suffix: **kwɔ̃:mɔ̃** 'completion'. The suffix vowels in these classes are identical or similar to the stem vowels.

9 THE COMPLEX WORD

9.0 The complex word: an overview. The phonological level between the basic word and the breath group is designated herein as the complex word. It is a unit of complex patterns of phonemes and prosodies bounded by word juncture, and is realized as two subtypes, the expanded word and the compound word (sect. 9.1 and 9.2). Each subtype has delineating characteristics that set it apart from the other, from the basic word, and from the breath group. Yet both share some features that contrast in their realizations with other levels.

9.0.1 The subtypes share some features not found in the basic word.

* Both subtypes potentially allow sequences of tone in any combination, whereas each basic word carries only one tone;

basic	complex: expanded	complex: compound	(178)
na᷆ [nā᷆]	**nā:gī** [ná:gɨ]	**kɔ̄lɔ́-djã̏ɔ̏** [kɔ̄lɔ́jʌ̏ɔ̏]	
'fire'	fire-the	well-good	
	'the fire'	'good well'	
(descending tone)	(H-L sequence)	(R-L sequence)	

A sequence of high and low tones occurs on the expanded and on the compound word, but not on the basic word;

* The compound word allows length in any position, and the expanded word allows it initially and finally, but the basic word restricts length to the first syllable.

sjɔ̌:=lɔ	**sjɔ̃:=wī:**	**sjɛ̃:-djo:=ro**	(179)
'millet'	person-which	word-speak-suf	
	'which person'	'speech'	

* Although in both types of complex words, glottalization could potentially be realized the same as it is in basic words, it is less prevalent in the complex words and is elided in many of their stems preceding final juncture or internal open juncture.

kpaˀa 'house'	**kpa:ya**	**kpa:-kpɔ̄:-tjȁ=gà**	(180)
kpɔ̄ˀɔ̄ 'enlarge'	'houses'	house-large-good	
		'good big house'	

* Both types of complex words allow vowel and consonant sequences and some variants that do not occur in the basic word. Medial consonant r variant of the phoneme d is allowed, but medial consonants y and t are not allowed in the basic word.

basic	complex	
	expanded	compound
sɛ̃ʔɛ̀lɛ̃	**sɛ̃ʔɛgèlɛ̃**	**ŋ̃ɔ̃-da:la** (181)
'basket'	basket-pl-the	breath-get-suf
	'the baskets'	'a rest'

Only ɛ, i, or ɔ may follow ɛ. Vowel sequences ɛ-e and ɔ-a: do not occur in the basic word.

sjɛ̃:rɛ	**kpa:ya**	**ka-tã̀:rà**	(182)
'words'	'houses'	affair-sweet-suf	
		'laughter'	

* Both subtypes consist of a nucleus of possibly more than two syllables and an optional postnuclear satellite of one or more syllables in contrast with the basic word which is limited to a nucleus of only one or two syllables and an optional satellite of one short syllable.

* Both subtypes may have the same word rhythms as in the basic word, but they may be realized differently, and other rhythm patterns occur in them in addition to those found in the basic word (pages 166 and 172ff.).

9.0.2 Both types of complex words contrast with the breath group phonologically and morphologically.

(1) Phonologically the following differences exist:

* The complex word is bounded by one preword juncture and one postword juncture. On the other hand, the breath group may contain several words, each of which is preceded and followed by word junctures. Word juncture is indicated in the following words by space.

complex word	breath group	(183)
tjɛ̃-dã:=lã	**tjɛ̃-dã:=lĩ nĩ́gɛ̃=ni**	
market-court	market-court middle-in-the	
'market place'	'in the middle of the market'	

* The compound word, but not the breath group, exhibits the cohesive feature of progressive assimilation which causes consonant sandhi (page 172f.) and vowel sandhi (page 175). Progressive assimilation extends across internal open juncture but not across external word juncture.

compound word	phrases	(184)
ŋ̃ɔ̃̀-djã: 'twin girl'	**nã̀w̃ tjɔ̃:** 'the man's wife'	
[ŋ̃ɔ̃̀ɔ̃+tjɔ̃lɔ̃:]	man-the woman	
twin+woman		

* Both types of complex words carry level intonation in contrast to the phonological group which may carry either level or terrace intonation. While complex words allow tone changes which are realizations of emphatic stress in the expanded word, or tone sandhi that characterizes syntactic types in the compound word, this is not the same as the intonation which occurs at higher levels.

complex word	breath group		(185)
gò-nyű̃gō	**mɔ̃́bīlīw̃ lá:rá**	**ni**	
chicken + head	car-the underneath	in	
'chicken head'	'under the car'		

By the intonation lines above the examples, it is seen that the complex word bears level intonation, but that the intonation of the grammatical noun phrase descends on the suffix **-w̃** of the first noun.

* Syllable reduction is **a** demarcative feature of the complex word, but not of the breath group.

expanded word	compound word	breath group	(186)
kārâ:	**ko-gbɔ̃:gì**	**kārī yâ:**	
[kárī yā:̄]	[kolo=gȍ kpɔ̃ˀɔ̃]		
go + there	road + enlarge		
'to go there'	'the big road'	'to go there'	

* Internal open juncture is a cohesive feature of the compound word, but not of the breath group. The examples above illustrate this.

(2) The morphological criterion for separating the complex word from the breath group is that the latter always contains an independent form as a nucleus, whereas the complex word nucleus is often a bound form. This is seen in the following words where the nuclei are underlined.

expanded word	compound word	breath group		(187)
ŋūnâ:	**nã̏-gbɔ̃ˀɔ̃**	**nǎw̃**	**bé:**	
[ŋúnɔ̃ yā:̄]	[nã̏ɔ̃̏ kpɔ̃ˀɔ̃]			
sleep + there	man + enlarge	man-the + there		
'sleep-there'	'large man'	'that man'		

9.0.3 In fast speech, the contrast usually present between complex words and breath groups sometimes breaks down. In which case, the same sequence can be realized phonologically as either a breath group or a complex word: **ŋūnɔ̃ yâ:** 'slept there' is often heard as an expanded word: **ŋúnâ:** 'slept there'. A compound noun may be recognized by the absence of a suffix on the first noun stem, but this method of recognition breaks down in words which have no indefinite suffix: **tàbālī** 'table' in a compound word is **tàbālī-pārāɔ̃** (table + seller) 'salesman'. This word must be heard in the definite form or another derived form to determine whether it is a compound word or a noun phrase. If it is **a** noun phrase, the definite suffix **-w̃** will be on the first noun, but if it is a compound, the definite suffix will be on the second noun: **tàbālī-pārāw̃** (table + seller + the) 'the salesman', but **tàbālīw̃ lá:rá ni** (table the underneath in) 'under the table'.

9.1 The expanded word subtype is a stress group bounded by word junctures. It contrasts with the basic word and with the compound word in the following ways:

* In its complex patterns of structure and of features, the expanded word contrasts with the simple patterns of the basic word.
* In that it has word stress on the initial syllable only, it contrasts with the compound word which allows stress on the initial and medial syllables.
* On the grammatical level, the expanded word corresponds to more than one morpheme, whereas the basic word has only one. The expanded word corresponds to nouns and verbs with added suffixes which may be translated 'the', 'that', 'some', and 'which'. Or the expansion may include clitics which are postpositions or tense-aspect particles, and sometimes general class pronouns and adverbs.

sjɛ̃́:m̀mè:	**nǎẁ̥ŋ̀gí**	**kɔ̃̀:**	**la:̀** (188)
[sjɛ̃̄:=mɛ̃̄ + mì + bè:]	[nā̃ɔ̃̄ + wì + mì + gí]	[kɔ̃̄ + mì]	[lē + yā:̀]
crowd + the + that	man + the + cp + it	yet + cp	put + there
'that crowd'	'the man has it'	'has yet'	'put there'

9.1.1 Structure of the expanded word. Details of the structural characteristics and feature realizations peculiar to the expanded word are described in the following paragraphs. Figure 4 diagrams the structure. Here the parentheses signify optional occurrences, and the / signifies 'either, or'; the period marks syllable boundaries.

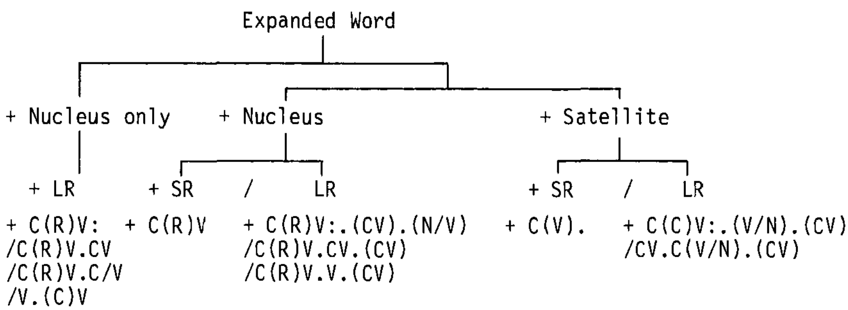


Figure 4. The Expanded Word

Read: The expanded word is realized as either a nucleus or a nucleus-satellite type. The nucleus type consists of one long rhythm unit of a C(R)V:, C(R)V.CV. C(R)V.C/V or V.(C)V subtype. The nucleus-satellite type of expanded word consists of a nucleus either of one short rhythm unit of a C(R)V subtype, or of one long rhythm unit of a C(R)V:.(CV).(N/V), C(R)V.CV.(CV) or C(R)V.V.(CV) subtype. It is terminated by a satellite of either one short rhythm unit of a C(V) subtype or one long rhythm unit of a C(C)V:.(V/N).(CV) or CV.C(V/N).(CV) subtype.

The expanded word is realized as two kinds: consisting of a nucleus only or consisting of a nucleus and a satellite.

(1) The expanded word consisting of a nucleus only contrasts in two ways with the basic word consisting of nucleus only:

* The nucleus of the expanded word must consist of a long rhythm unit, whereas the basic word nucleus may consist of a short or a long rhythm unit.
* The long nucleus of the expanded word may end in a syllable consisting of a consonant in contrast to the basic word which does not end in a consonant except in fluctuation.

expanded word		basic word	(189)
sĩ.ñ	**tjẽ.w̃**	**kã.rĩ** [kã.ři ~ kã.ř́.]	
but + has	woman + the	go	
'but has'	'the woman'	'to go'	

Examples of the expanded word consisting of a nucleus only illustrate the correlation between the morphological complexity and the feature complexity as a criterion for setting up the category of the expanded word. The syllables under 'syllable sequences' are separated by periods.

	syllable sequences	example	underlying form		(190)
1.	C(R)V:	**mă:̃**	[mă: ni djà]	'was going to'	
2.	C(R)V.CV	**ŋɔ̃́nĩ**	[ŋɔ̃nɔ̃-lĩ]	'the knife'	
3.	C(R)V.V	**mɔĩ** ~ **mɔɔ̃**	[mɔ ĩ]	'you should'	
4.	C(R)V.C	**peñ**	[pe mĩ]	'they have'	
5.	V.(C)V	**ãwɨ̃** ~ **ãɔ**	[à wĩ]	'and he'	

(2) The expanded word consisting of nucleus and satellite contrasts in two ways with the basic word which also consists of nucleus and satellite:

* The entire expanded word may have a maximum of five syllables in contrast to the maximum three syllables of the basic word. Of the total syllables of the word, the maximum number in the expanded nucleus is three in contrast to the maximum two allowed in the basic nucleus, and the maximum number of syllables in the expanded satellite is two in contrast to the one allowed in the basic word. The expanded satellite may consist of either a short rhythm unit of one short syllable, a long rhythm unit of two or three short syllables, or one long syllable, whereas the basic word satellite is restricted to one short rhythm unit.

basic word		expanded / compound expanded word		(191)
tjɔlɔ=ɔ̃	'woman'	**tjẽ=bẽlẽ**	'the women'	
woman		woman + the + pl		
lãrĩ=gã	'hide' (tr)	**ka-lãrĩga=gẽlẽ**	'the secret things'	
hide + tr		affair + hide + the + pl		

* Saturation develops when added syllable types occur in the expanded nucleus and satellite which do not occur in the nucleus and satellite of the basic word. The phenomenon of saturation causes added sylla-

bles to merge with the preceding syllables so that the saturation limit is not exceeded. This results in syllable types: CVN ~ CN, CVV ~ CV, and (C)CV:(V). (Periods are used to separate the syllables.)

(192)

	syllable sequences	expanded word	
1.	CV=CV.C(V).N	**pɔ̃=bèlèñ ~ pɔ̃=bèlñ**	'the dogs have'
		dog + the + pl + cp	
2.	CV.C(V).V=CV.CV	**wòlèĩ=ragi ~ wòlĩ=ragi**	'we should be (v) it'
		we + des + ct + it	

In number 2 of example 192, the underlying form is [wòlò ĩ ra gi]. The assimilation of final -ò of **wòlò** to the following ĩ makes the form **wòlèĩ** in the first utterance, and reduces the second utterance to **wòlĩ.**

9.1.2 Features of the expanded word were introduced above in the overview. More information is now given on the realization of stress, rhythm, and nasalization in the expanded word. The features of vowel and consonant elision and tone sandhi are also described.

(1) Emphatic stress is a nonphonemic, demarcative feature of the expanded word resembling the focal stress of the higher levels. It is limited mostly to the grammatical category of nouns when the noun basic form is joined to the definite or demonstrative suffix, or to the partitive suffix. Whereas in the Tyebaara dialect these suffixes are joined to the noun stem, in other dialects they are separate and, with the noun, form noun phrases. In Teneri, for example, the definite suffix is joined to the stem, but the partitive and demonstrative are separate. In Tagbana, the definite suffix is also separate. Emphatic stress occurs in addition to initial word stress.

Emphatic stress is realized as:

* increased width of interval between the final tone of the stem and the tone of the suffix,
* the raising of the final tone of the stem and the lowering of the tone of the suffix, and
* concentration of intensity and speed on the stem.

Tone variants of emphatic stress are realized as follows:

* stem mid tone becomes mid high or high:

(193)

	basic	expanded (with emphatic stress)
1.	**folo=mɔ̃** 'explosion'	**folɔ́=mɛ̃̌ ~ fɔ́lɔ́=mɛ̃̌** 'the explosion'
	explosion	explosion + the

* stem low tone becomes low-mid:

2.	**sɛ̀=mɑ̀** 'oil'	**sɛ̌=m̃mɛ̀:** 'that oil'
	oil	oil + that

* stem high tone remains high:

3.	**mɛ́ʔɛ́** 'name'	**mɛ́:=gì** 'the name'
	name	name + the

(2) Rhythm in the expanded word is a demarcative feature which unites words and particles into long and short rhythm units. These units combine to form word rhythms. No more than two rhythm units may occur in an expanded word rhythm, but any combination of short and long rhythm units is possible. Only one word rhythm may occur in an expanded word, whereas a sequence of word rhythms may occur in the compound word.

Juncture is closely associated with rhythm. Only prefinal juncture occurs between rhythm units of the expanded word, but both prefinal and internal open juncture may occur between rhythm units (nuclear constituents) of the compound word (page 173). In an expanded word consisting of two long rhythm units, stress occurs only before the first unit, whereas in a compound word consisting of two long rhythm units, stress occurs before each unit. Stress (') is indicated only where it is under consideration, as in the following examples:

expanded word	compound word	(194)
'lārī=gele	**'lārī-'gū:=lō**	
time + pl	time + to die	
'times'	'time of death'	

Notice also that prefinal juncture occurs between the rhythm units in the expanded word, in contrast to the internal open juncture which occurs between nuclear constituents of the compound word.

Five word rhythms occur in the expanded word. This includes the two additional word rhythms, short-long (.=—) and long-long (—=—). It excludes the basic word rhythm, short (.), because the short rhythm unit in the expanded word must always occur with another unit. The rhythms of the expanded word are as follows:

1. long (—)	**sâ:**	go + cp	'went'	(195)
	tṓw̃	father + the	'the father'	
2. short-short (.=.)	**kɔ=yɔ̃**	hand + pl	'hands'	
3. short-long (.= —)	**bă-bēlē**	sheep + the + pl	'the sheep'	
4. long-short (— =.)	**lārīgà=là**	hiding (n)	'hiding'	
5. long-long (— = —)	**lārī=gele**	time + pl	'times'	
	ya:=m̄mà:	illness + some	'an illness'	

Long rhythm units in the expanded word differ from those in the basic word as shown in chart 22. The final syllable of subtype 2 is most often realized in its full form, C(R)VCV, in the basic word. It is realized as C(R)VC only in fluctuation with C(R)VCV in relatively few basic words, such as adjectives and verbs which end in i, as in **kārī** ~ **kār̆** 'to go'. It also occurs in a few noun stems preceding homorganic consonants as in: **gɔ̀rīrɔ̄** ~ **gɔ̀r̆rɔ̄** 'cotton'. It is realized only as C(R)V̲V̲ in **wii**-class nouns as in **nãɔ̃** 'man'.

On the other hand, the final syllable of many expanded words may be realized as either V or C (see subtype numbers 2, 3, 4, 5 and 6 in chart 22). The following realizations of the final syllable occur:

Chart 22

DISTRIBUTION OF LONG RHYTHM UNIT SUBTYPES IN BASIC AND EXPANDED WORDS

long rhythm unit subtypes	distribution in word rhythms long		long	nuc (+ sat)	long sat
1. C(R)V:	BW	EW	BW	EW	
2. C(R)V(C)(V)	BW	EW	BW	EW	
3. CVCV(N/V)				EW	EW
4. (C)CV:(N/V)				EW	EW
5. C(R)V:(C)(V)(N/V)				EW	
6. C(R)V(C)(V)(N/V)				EW	
7. C(R)VCVCV				EW	

C(R) indicates consonant plus optional secondary release of consonant. Note that CR does not occur in the satellite.

* Definite nouns ending in -Cĭ are realized as -w̆, -lĭ ~ -l̆, -nĭ ~ -n̆, and -mĭ ~ -m̆.

lălĭ ~ **lăl** 'the time', **kā̆mĭ** ~ **kā̆m** 'the way' (196)

nă̆w 'the man' becomes **nă̆wĭ** only when followed by **i**: **nă̆wĭ:** 'the man is'

* Vowel clitics representing tense, mode, and aspect: i, ī, à, ò may be added to words preceding them. Negative particles may be added to any sentence final word.

tjā̆ĭ 'not know?' know + neg + q		**sĭò** ~ **sō:** 'but is not' but + ct + neg	(197)
wà:=ō ~ **wà.ò** 'someone is one + ct + neg not'		**wòà** ~ **wà:** 'we will' we + fut	

* The clitics **ñ** representing past and present completive tense and **n** 'you' hortatory pronoun (**mi**) may be added to words preceding them. The longer form of **ñ**, **mĭ** is rarely used.

tɔ̃nɔ̀=ñ	really + cp	'really has'
tɔ̃nɔ̀ñ=gĭ	really + cp + it	'really has it'
sjɛ̃́:=bèlèñ ~ **sjɛ̃́:=bèlñ**	person+the+pl+cp	'the people have'
yĭrĭ=n yérê	get up + you stand	'stand up'

Subtype number 4 in chart 22 occurs only in the satellite of the expanded word. It comprises the concord suffix of the noun plus a pronoun suffix of the demonstrative, interrogative, and limitative types. In some cases, particularly in nouns of the **wii** class, the concord suffix is dropped. The vowel i of the concord suffix never occurs in combination with the demonstrative, interrogative, or limitative suffixes, since the consonant of these suffixes is always homorganic with the concord suffix:

kpá:=ǧgè:	[kpá:=g:è.]	'that house'	[kpá:gî + gè:]
kpa:=ǧgã:	[kpā:g:à.]	'another house'	[kpa:gî + kà:]
šjɛ̃:=r̂rè:	[šʲɛ̃:r̂:è.]	'those words'	[sjɛ̃:rî + dè:]
kã=m̂mî:	[kãm:ǐ.]	'which way'	[kãmî + bǐ:]
kã́=m̂bè:	[kã́m̂bè.]	'that way'	[kãmî + bè:]

In Tyebaara, homorganic consonants are heard with no break between them. In the close, contiguous dialect of Tãgaara in the Koboło area, the two consonants are pronounced as successive consonants, and in slow speech i is heard between them: **kpá:=ǧ(i)gè:**. In other dialects, these pronouns are not attached to the nouns but occur separately: **kpaʔa kà:** 'another house' (Tenere of Boundiali).

In chart 22, subtypes numbers 6 and 7 occur only in the expanded word preceding a satellite. The following criteria provide the basis for analyzing C(R)V:CV and C(R)VCVCV as different from C(R)V:=CV and C(R)VCV=CV. The syllables C(R)V:CV and C(R)VCVCV which are realized as long rhythm units in nuclei, are shorter than the same syllables when they are realized as long-short word rhythms in independent words. Each syllable is shortened when three syllables occur in the nucleus; the vowels and noninitial consonants are the C-3 type which occur only medially within rhythm units.

basic word (– =.)		complex word: expanded nucleus (– –)(200)	
1. **yîrî=gè**	'to raise'	3. **sjɛ̃:=yirige=re**	'rouse someone' (n)
[yîr̂ì=gè]		[šɛ:yîr̂ìɣɛ̃r̂ā]	person + raise+suf
2. **fã́:=nã́**	'to deceive'	4. **fã́:nã́=gá**	'deception'
[fã́:nã́]		[fã́.nʌ̃gā]	deceive+suf

The underlined part in number 3 above contrasts particularly in the third syllable with the same word in number 1: the fricative g is a class 3 consonant occurring only medially within a rhythm unit. Number 4 contrasts with number 2 in the length of the long vowel of the initial syllable. Even though the long vowel is shortened, it is still longer than the short vowel in the same word.

(3) Nasalization is realized on the nucleus of the expanded word as it is in the basic word. However, in the expanded word, it does not always extend across prefinal juncture when continuants are the consonants of the satellites. This contrasts with the basic word where medial continuants are always nasalized in a nasal word.

Nasalization extends across medial continuants in those expanded words which are realized as one long rhythm unit. In the following examples, the word is given first in phonemic transcription in which the feature of nasalization is written as a superscript n preceding the word, then in phonetic transcription: **ⁿŋɔ̀lì** [ŋɔ̃̀nì] 'the knife'.

Nasalization may optionally extend across prefinal juncture in nouns of the **lii** class and the **pii** class when the partitive and demonstrative suffixes are added to the noun. Some speakers always nasalize the con-

tinuants in these examples. Others nasalize the suffix continuant consonant in some expanded words and not in others.

ⁿŋɔ̃l=lɛ̃:	[ŋɔ̃ñlɛ̀.]	~	[ŋɔ̃ñ:ɛ̀.]	'that knife'
ⁿkɑ̃m̃=bɛ̃:	[kɑ̃m̃bɛ̀.]	~	[kɑ̃m̃:ɛ̀.]	'that manner'

(201)

Even when nasalization extends across the prefinal juncture to the suffix consonant, it does not extend to the suffix vowel except in fast speech: **ⁿkɑ̃m̃=bɛ̃:** [kɑ̃m̃:ɛ̃.] 'that manner'.

Nasalization does not carry across prefinal juncture preceding added particles such as **-lɛ̃** 'interrogative' (as in **tɪ̃=lɛ̃** 'full?') and plural **-yV** (as in **tjɑ̃=yɑ̀** 'days').

(4) Vowel and consonant elision are demarcative features which occur in the expanded word across the boundary between the nucleus and the attached particle. This often results in the reduction of syllables.

[bɪ̄ + ra]	**bɑ̀ɪ̄**	be + ct	'to be'
[mă:+ni+djà]	**mɑ̌ɑ̀**	rem p + ct+fut	'was going to'
[ka:rà + tà:]	**ka:r̃rɑ̀:**	meat + some	'some meat'
[nɑ̃ɔ̃ + bɛ̀lɛ̀]	**nɑ̃bɛ̀lɛ̀**	man + the + pl	'the men'
[kɔ̃ + mɪ̄]	**kɔ̃:**	even + cp	'even has'
[à + wi]	**ɑ̀ɔ ~ ɑ̀wi**	and + he	'and he'

(202)

In the final example above, assimilation and reduction occur: wi becomes ɔ following à.

(5) Tone sandhi occurs in the expanded word in the indefinite plural suffix forms **-gɛlɛ** and **-bɛlɛ.** The tones of these variants are predictably realized according to the following rules (stem and suffix are separated by prefinal juncture [=], and suffix and basic word tones are given):

* High mid when suffixed to a basic word of mid, high, or rising tone:

basic word		expanded word	
búrú	'bread'	**búrú=bɛ́lɛ**	'bread' (pl)
ŋɑ̌=ɔ̃ [ŋɑ̌ɔ̃]	'twin'	**ŋɑ̌=bɛ̂lɛ**	'twins'
tjɑ̃=nɑ̃	'calabash'	**tjari=gɛ́lɛ**	'calabashes'

(203)

* Mid mid tone in a basic word of low tone:

lɪ̄:=lɛ̀	'meal'	**lɪ̄:gɛlɛ**	'meals'

* Low mid tone in a basic word of descending tone:

ko-bilɛ̀	'path'	**ko-bi:=gɛ̀lɛ**	'paths'

The last example above is a compound word whose final nucleus and satellite comprise an expanded word.

Tone sandhi also occurs on general class pronouns when these occur with the phonological group (page 181).

9.2 The compound word, a subtype of the complex word, is a level intonation group bounded by external word juncture. It is identified by features of cohesion consisting of tone sandhi, consonant and vowel sandhi, and internal open juncture which occur within it, but not across external word juncture.

The compound word consists of two to four nuclei of basic and/or expanded words. The expanded word occurs in word final position when it is a component of the compound word. Morphologically the compound word corresponds to combinations of nouns, verbs, adverbs, adjectives, and particles:

ya-le=ge [yari=ga + le] 'container' (204)

Some general characteristics have been cited earlier in delineating other units of this language, and now these are seen to set the compound word apart from the other types.

* The compound word consists of an obligatory nucleus of from two to four stress groups plus an optional satellite. The stress groups may be nuclei of basic words or of expanded ones, but the latter occur mainly in final position, and only the final stress group may be realized as a nucleus and satellite.

sjɛ̃: + lõʔõ(ñ) + djo:=o	**sjɛ̃: + lõʔõ(ñ) + djõ:=bèlê**	(205)
words + hear + cp + speak+suf	words + hear + cp + speak + pl + def	
'interpreter'	'the interpreters'	

* The nucleus of the compound word allows a nasalized syllable to follow an oral one, in contrast to the nucleus of the basic word in which nasalization begins on the initial syllable.

basic	compound		(206)
ŋɔ̃=nɔ̃ 'knife'	**ka+nɔ̃́ʔɔ̃́=rɔ̃** affair+dirty+suf	'immorality'	

* The compound word allows word stress on more than one component in contrast to the restriction of stress to only one component in both the basic word and the expanded one.

* The compound word allows secondary release of consonants on stressed syllables in any position, while basic and expanded words restrict it to the initial syllable.

basic	complex:	expanded	compound	(207)
tjõrõ		**tjõrõ=mĭ**	**kà-tjõ:=lõ**	
'to count'		counting + the	'courtyard'	
		'the accounts'		

* The compound word permits length in any position in the word, whereas the expanded word allows it in initial and final position, and it is restricted to the initial syllable of the basic word.

basic	complex:	expanded	compound	(208)
sjɔ̃:=lɔ		**sjɔ̃:=wĭ:**	**sjɛ̃:-djo:=ro**	
'millet'		person + which	word + speak + suf	
		'which person'	'speech'	

9.2.1 The structure of the compound word is shown in Figure 5.

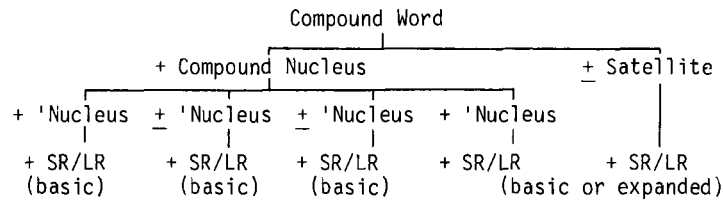


Figure 5. The Compound Word

Read: The compound word consists of an obligatory compound nucleus and an optional satellite. The compound nucleus consists of up to four components, of which two are obligatory and two optional. Each nuclear component is a nucleus bearing stress which may be realized as a short or a long rhythm unit. The satellite does not bear stress, but it too may be realized as a short or a long rhythm unit. Prefinal components of the compound nucleus include only the syllable types and sequences, plus the consonant, vowel, and tone sequences found in the nucleus of the basic word. The final component of the compound nucleus, and also of the satellite may include syllable types and sequences plus consonant, vowel, and tone sequences found in both basic and expanded words.

There are two exceptions to the statement that syllable types of prefinal components of the compound nucleus are those occurring in the basic word. In the compound word, N̩ (short syllabic nasal) which does not occur in basic words, may occur as a syllable type in any prefinal component but N̩: (long syllabic nasal) and V:, which occur as basic words, may not occur as syllable types in prefinal nuclear components of the compound nucleus.

The final nuclear component and satellite comprising the final stress group of the compound word make a single phonological unit as the following criteria show:

* The vowel sequence pattern:

kpa:-tɔ̃nɔ̃=gɔ	**kpa:-fi:=ge**
house + tall + suf	house + whiten + suf
'multistory house'	'white house'

(209)

The vowel of the suffix **-gɔ** agrees with the vowels of the contiguous nucleus **tɔ̃nɔ̃,** and that of the suffix **-ge** agrees with the contiguous nucleus **fi:**; neither is **a** which would agree with the noncontiguous nucleus **kpa:.**

* the satellite tone is a part of the tone of the final nucleus in the indefinite form of compound nouns:

wálí-nɛ̃ʔɛ̃=ɔ̃	**wálí-tjǎ=ɔ̃**
money + augment + suf	money + be good + suf
'much money'	'good money'

(210)

The satellite tone is mid following the mid tone of the final nucleus,

and low following low tone on the nucleus. If it agreed with the first nucleus, **wālī**, it would be mid allotone of high, but never low tone.

* The assimilation of the satellite consonant to the preceding nucleus (the satellite consonant is underlined in each of the following):

1. **ñ-dɔ̃=nɔ̃**	2. **ñ-dɔ̃-nyɛ̃:=nɛ̃**	3. **ñ-dɔ̃-wɔ:=lɔ**	(211)
head ∓ cover+suf	head + cover + redden+suf	head + cover + blacken+suf	
'hat'	'red hat'	'black hat'	
4. **fàgà**	5. **fà-gbɔ̃ʔɔ**	6. **fà-djɛ̃=gà**	
	marsh ∓ enlarge+suf	marsh + good+suf	
'marsh'	'large marsh'	'good marsh'	

The consonant of the satellite assimilates to the quality of the final nucleus, as affected by features such as length, nasalization, etc. In example 211, numbers 1 and 2, the suffix consonant l becomes n following a nasalized nucleus. In number 5, the satellite syllable overlaps the long nucleus, and the satellite consonant g becomes a glottal stop.

The satellite morpheme **gV** and the nucleus combine when the feature of length occurs on the final nucleus, because the quality of the long vowel assimilates the following consonant g causing it to become a glottal stop, but glottal stops do not occur following a long vowel. Therefore, rather than taking the form **fà-gbɔ̃:=ʔɔ**, which cannot occur, **fàgà** and **kpɔ̃ʔɔ** combine to become **fà-gbɔ̃ʔɔ** 'large marsh'.

The consonant of the satellite of the compound noun is the consonant of the concord class to which the compound noun belongs. This varies with the types of compound nouns. However, just as some basic nouns can be changed from one class to another by changing the concord suffix, some compound nouns may be changed simply by changing the suffix or by adding a stem which changes the meaning and the suffix (the concord class is noted in parentheses):

sī-sjɔ̃=ʔɔ̃ (kii)	**sī-sjɔ̃:=nɔ̃ (lii)**	**sī-sjɔ̃:=rɔ̃ (tii)**	(212)
(large) fly	(small) fly	(collective) flies	

Usually the compound word includes a satellite, but when the compound is a verb or an adverb, there is no satellite.

9.2.2 Features of the compound word serve as factors of cohesion and to distinguish its different subtypes. The compound word is characterized by tone sandhi, consonant sandhi, and some vowel sandhi which occur across the boundaries between stressed nuclei. The juncture at these boundaries is internal open juncture, which as a feature of the compound word is described first in this section, followed by consonant sandhi and vowel sandhi. Stress is also seen to be a factor in delineating compound words, acting in conjunction with other features.

Most of the assimilation is progressive. An exception to this is the assimilation of the prefix tone and vowels to the nucleus which follows. The assimilation is not entirely automatic; it is conditioned by the identity of the morphemes. This is particularly true of the morphotonemic changes of different types of compound words and in the assimilation of the vowels which occur only in combinations of certain morphemes.

Tone sandhi as a feature of the phonological phrase was described earlier. As a feature of the compound word it is described in the next section where it is best seen to distinguish subtypes of the compound word.

(1) Internal open juncture functions as a demarcative feature in the compound word. It occurs as a transition between two nuclei of a compound word and is characterized by the following phonological criteria:

* The rhythm units preceding and following internal juncture are of equal intensity: both units carry word stress and both have initial consonant type 1. This is in contrast to:

  external word juncture which may be preceded by a stressed or an unstressed rhythm unit:

internal open juncture	external word juncture	(213)
nā̃-bé:=o [n̥ā̃b̥é:ō]	**nǎ̃=bèlè//bé:** [n̥ǎ̃b̥ə̄l̥ə̄ b̥é.]	
man + bad + suf 'bad man'	man + the + pl there 'those men'	

  prefinal juncture (=) which is always followed by an unstressed rhythm unit and preceded by a stressed rhythm unit. Consonant type 2 follows prefinal juncture, but consonant type 1 never does (see examples above).

* Internal open juncture is preceded by rhythm units characterized by sequences of tones, vowels, and consonants found in the basic word, and not by the complex sequences found in the expanded word. This contrasts with external word juncture, which may be preceded by rhythm units found in either basic or expanded words.

gō-pɔ̄lɔ̄ [g̥ō p̥ɔ̄l̥ɔ̄]	**gǒw̃//fɔ̄lɔ̄** [g̥ǒw̃ f̥ɔ̄l̥ɔ̄]	(214)
chicken + male 'rooster'	chicken + the owner 'the chicken owner'	

* The short vowel preceding internal open juncture does not diminish in length or intensity unless the vowel is i and occurs between homorganic consonants, where it is elided. However, the short vowel in an unstressed syllable preceding external word juncture diminishes in intensity and the short i may be elided before word final juncture after r, n, m, l.

fali-félé=ó [f̥āl̥ĭf̥él̥éō]	**lǎlì** [l̥ǎ.l̥ì ~ l̥ǎ.l̥.]	(215)
work + kind + suf 'type of work'	time + the 'the time'	

but

fā̀nì-nā̃ga [f̥ā̀n̥n̥ā̃g̥ā] ~ **fā̀-nā̃ga** [f̥ā̀n̥ā̃g̥ā]

cloth + tail
'loin cloth'

The short vowel is lengthened slightly before both internal open juncture and prefinal juncture.

basic word	internal open juncture	prefinal juncture	(216)
pṹlõ [pṹlõ]	**pú-kpá:** [pṹ.kpá]	**pú=gèle** [pṹ.gə̀lə̀]	
groundpea 'groundpea'	groundpea + weevil 'groundpea weevil'	groundpea + the + pl 'the groundpeas'	

* The long vowel preceding internal open juncture diminishes in duration, but there is still a perceptible contrast between the shortest duration of the long vowel and the longest duration of a short vowel before open juncture (see chart 16). In the following examples, the longest duration of the short vowel is marked in the phonetic transcription by a period, the shortest duration of the long vowel is marked in the phonetic transcription by a colon, and the longest duration of the long vowel is marked by a colon plus a period. The difference in centiseconds before open juncture is shown in chart 16.

short vowel preceding internal open juncture	long vowel preceding internal open juncture	(217)
nã̀-bĩlé [nã̀.bɨlé]	**nã́:-bĩlé** [nã́:bɨlé]	
man + small + suf 'boy'	scorpion + small + suf 'small scorpion'	

Long vowels contrast in duration preceding the internal open juncture where the shorter variant occurs, and preceding prefinal juncture where the longer variant of the long vowel occurs.

long vowel preceding internal open juncture	long vowel preceding prefinal juncture	(218)
nã́:-bĩlé [nã́:bɨlé]	**nã́:=bèlè** [nã́:.bə̀lə̀]	
scorpion + small + suf 'small scorpion'	scorpion + the + pl 'the scorpions'	
fã:-gãmã̀ [fã̄:gã̄ˆmã̀ˆ]	**fã́:=nã́** [fã́:.nã́]	
build + design + suf 'manner of building'	deceive 'to deceive'	

The long vowel is the same duration preceding internal open juncture and preceding external word juncture, but a perceptible breathiness occurs at the end of the voicing of the vowel before external word juncture. The breathiness is not perceptible before internal open juncture: it is represented by the A following a.

internal open juncture	external word juncture		(219)
kpa:-fã:-gãmã̀ [kpā:fã̄:gã̄ˆmã̀ˆ]	**//kã:**// [káÁ]	**//fã:**// [fã̄Ã̄]	
house + build + design + suf 'house style'	chew 'to chew'	build 'to build'	

Optionally, a very short pause occurs between the two nuclei in the compound word. Internal open juncture may also be defined as the transition across which features of tone, consonant, and vowel sandhi occur.

(2) Consonant sandhi is a demarcative feature which functions at the level of the compound word. Two types of consonant sandhi occur:

Regressive assimilation occurs in nasalized nuclei in which the vowel has been reduced and the initial nasal consonant remains. The nasal consonant assimilates to the initial consonant of the following nucleus. Often both long and short forms are in free fluctuation.

mã-dẽgẽ	~ **ñ-dẽgẽ**	'corn'	(220)
nyṹ-dɔ̃=nɔ̃	~ **ñ-dɔ̃=nɔ̃**	'hat'	

Progressive assimilation occurs when the initial consonant of a nucleus assimilates to the nucleus immediately preceding it. It is realized as the voicing of a voiceless initial consonant of a nucleus. It occurs in all types of compound words. Concentration of heaviness in the inducing nucleus carries across the internal open juncture and causes the initial voiceless consonant of the following nucleus to become voiced.

Certain segments and features in the stem cause heaviness of the nucleus, and other segments and features cause lightness in the nucleus. Some nuclei are in the neutral zone between heaviness and lightness. These may be further influenced toward heaviness or lightness by the suffix consonant of the word. (The terms heaviness and lightness as used in this study indicate contrasting qualities of pronunciation caused by both segmental and prosodic features of compound words.)

1. [lõ-wá:=ɔ + tjã̀]	2. [lõ-wá:=rá + tjã̀]	3. [lõ-wá:=má + tjã̀]	(221)
lõ-wá:-tjã̀=ɔ̃̀ ~	**lõ-wá:-tjã̀=rà** ~	**lõ-wá:-djã̀=mà**	
lõ-wá:-djã̀=ɔ̃̀	**lõ-wá:-djã̀=rà**		
water+throw+good+suf	water+throw+good+pl	water+throw+good+suf	
'good fisherman'	'good fishing' (n)	'good fishing'	

In example 221, numbers 1 and 2, the initial consonant of the underlined nucleus may be realized as voiceless or as voiced, but in number 3, the consonant is mainly voiced. The only different factor in 3 is the suffix **-mã.** The nucleus **wã:** is neutral because it is comprised of the grave consonant w which is associated with heaviness, and the open vowel a plus the features of length and high tone which are associated with lightness. The suffix consonant m, which is grave and associated with heaviness, is then the deciding factor. The fact that the nucleus and suffix together color the heavy or light quality of the entire word is an added proof that it is best to study the phonology at the level of the word. A study of syllables alone would not give an explanation of voicing in compound words.

I will list first the segments and prosodic features which contribute to heaviness or lightness. Then I will describe how combinations of these segments and features in the nuclei and suffixes color the nuclei.

In the following charts, the segments are arranged according to the inherent features acute/grave and diffuse/compact. There are two degrees of each feature. Chart 23a contains segments which are associated with lightness. Under each chart are listed suprasegmental features which tend toward either heaviness or lightness.

Chart 23a

SEGMENTS AND PROSODIES CAUSING HEAVINESS

	Acute	Nonacute	Nongrave	Grave
Diffuse	i:	d n	l	b w m
Nondiffuse		y e		
Noncompact		dj [ɟ]	ɔ gb	kw f g bw
Compact				

Prosodic features causing heaviness in nucleus: Nasalization, Glottalization, Tones (Descending, Low, Mid), Word Stress

Chart 23b

SEGMENTS AND PROSODIES CAUSING LIGHTNESS

	Acute	Nonacute	Nongrave	Grave
Diffuse	s sj z zj	t n i r	f u ŋ	u: p
Nondiffuse	e:	ny tj [cˡ]*	o	o:
Noncompact	ɛ:	tj [c] a	kp	k
Compact		a:		ɔ:

* preceding long vowels

Prosodic features causing lightness in nucleus: Length, Tones (High, Rising, sometimes Mid, Low), Secondary release (realized as palatalization)

In a sequence of nucleus-nucleus-satellite, the combination of the above segments and features in the initial nucleus, or in that plus those in the satellite, color the entire sequence causing the initial voiceless consonant of the intervening nucleus to become voiced. These combinations are described in the following paragraphs.

The acute-diffuse consonants and the acute, nonacute and grave-diffuse vowels are most often related to light nuclei. The sibilants s, sj, z, zj are almost always in light nuclei. The grave consonants and the voiced consonants are most often related to heaviness. Among the vowels, the ɛ: and a are most often in light nuclei, and the ɔ is most often in heavy nuclei. Anything that reinforces acuteness of vowels causes lightness or laxness in the nucleus, but anything that pulls an acute vowel toward the ɔ causes heaviness or tenseness.

(222)

lightness	heaviness
1. **sa-pilè**	2. **wa-bi:=rè**
[sali=gà + pí]	[wa=rà + pí]
skin + small	leaves + small
'whip'	'small leaves'
3. **ya-tjã=ga**	4. **yâ:-djã̂=5̃**
[yari=ga + tjã]	[ya:=ɔ + tjã̂]
thing + good	ill-one + know
'good thing'	'diagnostician' (doctor)

In example 222 number 1, the initial consonant s of the initial stem reinforces the acuteness of a, but in number 2 the heavy, grave consonant w pulls the a toward the ɔ in quality and causes heaviness or tenseness. In number 3, the y and a are closer to each other than are y and a: (see charts opposite). The y causes heaviness, and this and the ɔ suffix cause the nucleus to be heavy in number 4. In number 3, the nucleus is lightened in the original form by the **ri** as in **yari=ga.**

Nasalization concentrated on a short nucleus causes tenseness or heaviness on the nucleus, which in turn assimilates the initial consonant of the following nucleus, causing voiceless consonants to become voiced. This is in contrast to short oral nuclei.

(223)

nasalized	oral
sǐ-dâgá=lá	**sí-tjìlì=mɛ̀**
[sĩ + tágá]	[sì + tjìlì=gɛ̀]
neg + believe + suf	pref + to be clever
'unbelief'	'cleverness'

Length causes a short initial consonant with laxness on tongue and buccal muscles; this neutralizes the tenseness of nasalization.

(224)

long nasalized	short nasalized
kà-pɔ̃̀:-tjɛ̃̀=5̃	**pɔ̃-djɛ̀=5̃**
[kà-pɔ̃:+tjɛ̃̀]	[pɔ̃=5̃ + tjɛ̃̀]
foundation + good+suf	dog + pretty/good+suf
'good foundation'	'pretty dog'

Glottalization within the nucleus, or a tense segment in the nucleus or suffix, when combined with nasalization of another tense feature, offsets the laxness of the feature of length.

(225)

Heaviness	**Lightness**
long nasalized + low tone, grave segments m in the stem and m in the suffix	long nasalized + rising tone, grave segment m in the stem, but a zero suffix
mɛ̃̀:-bje=mã	**mɛ̌:-tɔ̃**
[mɛ̃̀:=mɛ̃̀ + pje]	[mɛ̃̀ʔɛ́ + tɔ̃]
humility + to do	
'humility'	'viper'

Length causes the tongue to relax, resulting in the articulation of the vowels being more peripheral and more acute. However, the capacity of the length feature to lighten the nucleus is neutralized when a feature such as glottalization or a voiced or a grave consonant is combined with nasalization and length.

length, nasalization, low tone m + glottalization in nucleus and -nV suffix	length, nasalization, high tone, m in nucleus, and -ʔV suffix	(226)
mɛ̃ʔɛ̃-gbɛ̀:=lɛ̄	**mɛ́:-kpɔ́ʔɔ́**	
[mɛ̃ʔɛ̃=nɛ̃ + kpɛ̀:=lɛ̄]	[mɛ́ʔɛ́ + kpɔ́ʔɔ́]	
fishing tackle + cane+suf	name + enlarge+suf	
'fishing pole'	'important name'	

The presence in the first nucleus of an initial consonant whose feature contrasts with the vowel feature also causes tenseness since it causes the vowel to become more centralized. This is in contrast to the nontense nuclei whose consonants and vowels agree in features, particularly when both are acute.

	grave/acute		acute/acute	(227)
1.	p e:	2.	s e:	
	ka-pe:-bje=rɛ̀		**sɛ́:-kpɔ́:ɔ**	
	deed + bad + do+suf		power + enlarge	
	'bad deeds'		'great power'	
	grave/acute		grave/grave	
3.	w i:	4.	w u:	
	wì:-zã̀=nã̀		**wū:-fī:-tī:=gɛ̄**	
	whistle + remainder+suf		thorn + whiten + tree+suf	
	'last whistle'		'white thorn tree'	

The two acute or two grave segments in example 227 numbers 2 and 4 do not have the heaviness or tenseness that comes from segments of opposing features, like those in numbers 1 and 3. The first stem segments of 4, **wu:**, are grave/grave, so that the f of the second stem remains voiceless. In the second stem f is nongrave or more neutral, and i: is acute. This does not cause voicing.

The suffixes **-V** and **-lV** and **-gV** color a neutral stem so it becomes heavy and assimilates the following stem voiceless consonant making it voiced. In contrast, the zero suffix of the **wii** class and the **-rV** suffix of the **tii** class tend toward lightness.

	heaviness -lV, -mV, or -gV suffix		**lightness** zero or -rV suffix	(228)
1.	**se:-gwɔ̄:-lɔ̄**	2.	**sɛ́:-kpɔ́ʔɔ́**	
	[se:=lɛ̄+kwɔ̄:]		[sɛ́:+kpɔ́ʔɔ́]	
	birth + finish+suf		power + enlarge+suf	
	'following birth'		'great power'	

3. **lī:-djã̀=nã̀**
[lī:=lē + tjã̀]
food + good+suf
'good meal'

4. **ya-lī:-tjã̀=rā**
[ya-lī:=ré + tjã̀]
thing + eat + good+suf
'good food'

5. **ko-bilē**
[kolo=gō + pī:]
road + small+suf
'path'

6. **gō-pɔ̄lɔ̄**
[gōlō + pɔ̄lɔ̄]*
chicken + male
'rooster'
* **gōlō** has zero suffix: **gōlō=Ø**)

7. **djo:-bē:=mã**
[djo:=mɔ̄ + pé:]
talk (n) + bad+suf
'bad talk'

8. **sjɛ̃:-djo:-tjã=ra**
[sjɛ̃:=rɛ + djo: + tjã̀]
words + say + good+suf
'good speech'

A suffix **-o** or **-ɔ** of **wii**-class nouns can combine with other factors to cause tenseness of the initial nucleus. In contrast, the glottal suffix or zero suffix of **kii**-class nouns give lightness or laxness to the nucleus.

nã̄:-gbɔ̄:=ɔ̄	**na:-kpɔ=ˀɔ̄**	(229)
[nã̄:=ɔ̄ + kpɔ̄ˀɔ̄]	[nâ: + kpɔ̄ˀɔ̄]	
scorpion + enlarge+suf	fire + enlarge+suf	
'large scorpion'	'big fire'	

The continuant medial l in the nucleus normally causes heaviness which assimilates the following voiceless consonant to become voiced. This contrasts with abrupt medial ř and medial n which tend toward lightness.

Medial l	Medial ř or n	(230)
kɔ̄lɔ̄-gbɔ̄:=ɔ̄	**kɔ̄rɔ̄-kpɔ̄:=ɔ̄**	
[kɔ̄lɔ̄ + kpɔ̄ˀɔ̄]	[kɔ̄rɔ̄ + kpɔ̄ˀɔ̄]	
well + enlarge+suf	boat + enlarge+suf	
'large well'	'large boat'	

Both initial stems are of the **wii** class and have zero suffixes. Stems of the CVCi syllable pattern tend toward lightness, except for those in which the initial consonant is dj, l, or k.

djeli-gã̄=mã̄	**fali-pje=o**	(231)
[djeli=ge + kã̄mã̄]	[fali + pje]	
crossing (n) + manner+suf	work + do+suf	
'manner of crossing'	'worker'	

(3) Vowel sandhi is a demarcative feature which functions at the level of the compound word. It is restricted in occurrence to one vowel in a few nuclei for each type of assimilation. Although other vowel sandhi is suspected, there is not enough evidence to identify it. Two types of vowel sandhi occur:

Regressive assimilation of the vowel of the initial nucleus to the following nucleus occurs, for instance, in the nucleus of the word **kɔlɔ̃** 'hand'. The nucleus is **kɔ̃**. The ɔ becomes a preceding nuclei with spread vowels; ɔ remains ɔ preceding nuclei containing back rounded vowels. The assimilation occurs only in those compounds which are semantically integrated such as 'fingernail'.

ka	**kɔ**	(232)
1. **kā-gbĕ=le** 'elbow'	2. **kɔ-bo:=lō** 'upper arm'	
3. **ka-da:=là** 'palm of hand'	4. **kɔ̃-zogi=lo** 'wrist'	

One exception is **kā-gŭnɔ̃** 'fist'. The CuCV syllable pattern of the verb **kùnɔ̃** 'crumple' causes the initial vowel to be very short, and the nucleus is further lightened by the medial n.

Compound words which are modified nouns, and not a single item like the above, do not assimilate the initial vowel: **kɔ̃-waʔa** 'empty hand'. A few other examples occur, such as **kā-naː** [kɔ́ + ni + djà] yet + ct + fut 'almost'. In this example, the **ni** + **djà** is contracted, becoming **naː** and the **kɔ̃** is assimilated by the **naː**, becoming **kā**.

Progressive assimilation of the vowel of a noninitial nucleus to the preceding nucleus occurs in the nuclei of the words **tjɔlɔɔ̃** 'woman' and **pɔ́lɔ́** 'male'. The nucleus **tjɔlɔɔ̃** becomes **tjā:**, **tjaʔā**, or **djā**: following a nucleus with spread vowels, and the nucleus **pɔ́lɔ́** becomes **pélé** following nuclei with spread vowels. Like the word **kɔlɔ̃** above, the vowels of these two words are assimilated only when the compound is semantically integrated.

a	**ɔ**	(233)
1. **pī-tjā:** child + female 'young lady'	2. **tjɔ̃ʔɔ̃-djā:=ɔ́** djoula + female+suf 'djoula woman'	
3. **nā:-pé:=lé** bovine + male+suf 'bull'	4. **nɔ̄-bɔ́=lɔ́** guinea fowl + male+suf 'male guinea fowl'	

In some cases, there is fluctuation between ɔ and a as in **fílā-tjɔ́: ~ fílā-tjā:=ɔ́** 'Fula woman'. When the compound is not semantically integrated, the ɔ remains ɔ as in **ti:-pɔ́=lɔ́** wood + male+suf 'forked stick'. A few other examples occur, as in the following in which the **mɔ** is assimilated by the preceding nucleus, becoming **mà** as in:

gàrī-mà-nɔ́: (234)

[kárí + mɔ + nɔ́:w̃(mā)] → [gàrī + mɔ + nɔ́:w̃(má)]
go + you + mother + to departure + your + mother + to
'name of month of mid-June to mid-July'

9.2.3 Types of the compound word are determined by the composition of the obligatory nucleus and optional postnuclear satellite. The nucleus may contain from two to four stressed components which are arranged in coordinate or subordinate order in the core and margins of the nucleus. As in the expanded word, the satellite of the compound word may contain one or two unstressed syllables.

The nucleus may consist of a core only, or of a core and a prenuclear and/or a postnuclear margin. The core and margins of the compound nucleus may be simple or complex.

The least complex types of compound words are the binuclear ones containing two nuclear components. Polynuclear compounds contain three or four components. The binuclear (binary) compounds are described first, followed by the polynuclear ones.

Subtypes of compound words are identified by the arrangements of sequences of nuclear components into cores and margins. The cores and margins are identified by allotones and by meaning.

Tone sandhi functions prominently in distinguishing compound subtypes; therefore, its characteristics are presented as a background first, before describing compound types and subtypes.

* The feature of tone sandhi in compound words is the realization of the tones of the components in patterns which distinguish the three major syntactic types of compound words: margin-core, core-margin, and core-core.

The identifying phonological features of the core are: (1) high or descending allotones, and (2) assimilation of tones of contiguous nuclei to its tones. The identifying phonological features of the margin are: (1) low allotones, and (2) assimilation of the margin tones to those of contiguous nuclei.

Either the margin or the nucleus may have stable tones. The rules for tone changes in each type of compound word are described under the types of compound words below.

Tone sandhi may function to distinguish meanings of compound words which have the same underlying components, since the tones are realized differently in each word. The following examples are listed under their syntactic types. Internal open juncture (-) is marked between nuclei, and prefinal or grammatical juncture (=) is marked between the final nucleus and suffix.

1. margin-core	2. core-margin	3. core-core	(235)
sī-sjɔ̃́:=rɔ	**su-pe:=rē**	**sī-sjɔ̃:=rɔ̀**	
[su=rɔ̀ + sjɔ̃́:]	[su-rɔ̀ + pé:]	[su=rɔ̀ + sjɔ̃:ri]	
food+stay(overnight)+suf	food + bad+suf	food + suck in + suf	
'leftovers'	'bad food'	'flies'	

In example 235, numbers 1 and 3 are solid compounds in which vowel sandhi is manifested. In number 1, descending tone of the underlying basic word **surɔ̀** is realized as low tone, **sī.** Low tone is an allotone occurring in margin nuclei. The tone of the core nucleus is stable,

remaining high tone. In number 3, the descending tone of **surõ** is realized as high tone, **sĩ**, and the mid tone **sjõ:ri** is realized as descending tone on the nucleus and the attached suffix. The descending tone in basic and compound words is realized on the combined nucleus and concord suffix when the suffix follows the nucleus. Otherwise, it is realized on the nucleus. Both nuclei are core nuclei and bear tones which occur on core nuclei. In number 2, the high tone of the second nucleus assimilates to the descending tone of the initial nucleus. The second nucleus **pẽ:** has two allomorphs: **pé:** with basic high tone as an adjective, and **pe:** with mid tone as a verb. Assimilation is a characteristic of the margin nucleus.

(1) The binary (binuclear) compound word consists of an obligatory compound nucleus and an optional postnuclear satellite. The compound nucleus contains an obligatory core and an optional precore or postcore margin. The core and the margin are characterized by the allotones and types of assimilation listed above.

Chart 24

BINARY SUBTYPES OF COMPOUND WORDS

Sub-type	MARGIN	N U C L E U S CORE	MARGIN	SATELLITE
1a	Nucleus, stable tones, noun or verb	Nucleus, predominantly high allotones, noun		optional
1b	Nucleus, possible low or assimilated allotones, prefix (often noun or pronoun)	Nucleus, stable tones or descending tones, verbs and some nouns		optional
2a		Nucleus, stable tones, noun or verb	Nucleus, possible assimilated allotones, mostly verbs	optional
2b		Nucleus, high-descending (if verb), adjective, adverb, or verb	Nucleus, no allotones, identical adjective or adverb	optional
3a		Nucleus-nucleus, high-descending prefix (nouns and some verbs)		optional
3b		Nucleus-nucleus, no allotone, verb-verb		optional

Types of binary compound words are identified by both phonological and grammatical criteria. Certain grammatical classes of words generally correspond to certain phonological types of compounds. There are some exceptions.

Chart 24 shows the arrangement of the components of the compound words in cores and margins. For each subtype, the predominant allotones and grammatical classes are also listed.

Summary:

The three main subtypes of binuclear compound words are: (1) margin + core + optional satellite, (2) core + margin + optional satellite, and (3) compound core of two nuclei + optional satellite. Each main subtype is realized as two variants. These will be described in the order that they appear in chart 24.

(a) Margin-core subtypes are of two kinds, designated 1a and 1b.

In subtype 1a, the initial nucleus (margin) is characterized by stable tones, and the second nucleus (core) by predominantly high allotones. On the grammatical level, the core nuclei are predominantly nouns, although some verbs may occur. The margin nuclei are also predominantly nouns.

In subtype 1b, the initial nucleus (margin) is characterized by low or assimilated allotones, the second nucleus (core) by stable tones if a verb, or by stable tones or descending allotones if a noun. On the grammatical level, the core nuclei are predominantly verbs, although some nouns may occur. The margin nuclei are prefixes which may sometimes be identified as nouns.

The above two subtypes are generally differentiated by their overall tone sequences, which in subtype 1a end in predominantly high tones and in subtype 1b begin in predominantly low tones and often end in low tones.

The procedure here followed is to distinguish the subtypes from each other only where they are introduced.

Margin-core subtype 1a is identified by predominantly high allotones on the second nucleus of the binary compound. Out of thirty-two tone sequences, twenty are realized as high tone on the second nucleus. Of these, twelve are phonetic realizations of other tones. If we consider the inherent tone of nucleus 2 as the basic tone of a morphotoneme, we conclude that: high tone is an alternant of every tone except rising; mid tone is an alternant of low, rising, and descending tones in certain sequences; and descending is an alternant of all tones except low in certain sequences. These will be described below.

The phonetic realizations of tone sequences of compound subtype 1a words are listed in chart 25. The underlying tone of each tone sequence is given for nucleus 1 in the vertical column and for nucleus 2 in the top horizontal line. The predominant allotones for each sequence are given first, with the less frequent realizations below them. The allotones are underlined.

The initial nuclear tone is stable in all examples except those whose inherent tones are descending. In these cases, the descending tone of the first nucleus normally spreads over the entire compound, giving an overall mid low descending tone. When that happens, as it does in most cases, inherent descending tone of the initial nucleus is realized as a mid allotone.

Chart 25

REALIZATIONS OF TONE SEQUENCES OF COMPOUND SUBTYPE 1a

NUCLEUS 1	NUCLEUS 2				
	H	M	L	D	R
H	H-H	H-H̲ H-M	H-L H-H̲	H-H̲	H+R
M	M-H	M-H̲	M-M̲ M-H̲	M-H̲	M-R
L	L-H	L-H̲ L-M	L-H̲ L-L	L-H̲	L-R
D	M-D̲ D-H	M-D̲ M-M̲	M-L L-H̲	M-D	M-D̲ M-R
R	R-H	R-M R-H̲	R-H̲ R-L	R-H̲ R-M̲	R-M̲

1. **pɔ̃-zi:=rè** 'dog hair'
   [pɔ̃: + sí:=ré]
   dog + fur+suf

2. **sjɔ̃:-kɔ̀lɔ̀** 'saddle' (236)
   [sjɔ̃ʔɔ̃̀ + kɔ̀lɔ̀]
   horse + chair+suf

3. **tũmɔ̃-gã:=nã̀** 'iron rod'
   [tũmɔ̃=rɔ̃ + kàgã:=nã]
   iron + stick+suf

4. **sjɔ̃:-tjaʔà** 'mare'
   [sjɔ̃ʔɔ̃̀ + tjɔlɔ̀ɔ̀]
   horse + woman+suf

In the above example, allotones occur on both nuclei except in numbers 2 and 4. The low tone of the second nucleus remains low in number 2. In number 4, the inherent descending tone is retained on the second nucleus.

A few examples are recorded in which the descending tone is retained on the initial nucleus or in which the initial inherent descending tone becomes low. In both cases, the second nucleus is high tone.

1. **dɔ̂-dɔ̃:=lɔ́** 'termite pot'
   [dɔ̃=ɔ̃̀ + kɔ̀dɔ́:=lɔ́]
   termites + pot+suf

2. **pɔ̃̀-nyũgɔ́** 'dog head' (237)
   [pɔ̃=ɔ̃̀ + nyũ=gɔ́]
   dog + head+suf

In number 1, the second nucleus retains its high tone, and in number 2, the second nucleus has inherent low tone.

A few examples are recorded in which the inherent descending tone of the initial nucleus is mid preceding mid or rising tone in the second nucleus.

1. **tjã-ze?e** 'birthday'
   [tjã=à̰ + see]
   day + be born+suf

2. **so-gã̰=nã́** 'elephant tusk' (238)
   [solɔ̀ + gã̰=nã́]
   elephant + tooth+suf

The tone of the second nucleus is realized as predominantly high, with some variations. The examples below follow chart 25. The tone of the second nucleus is realized as follows:

* High remains high following all tones, except those of most nuclei of inherent descending tone:

1. **tá-mí:=gé** 'soil'
   [tárá + mí:=gé]
   earth + flour+suf

2. **kpa:-tjíbí=gé** 'dust' (239)
   [kpa?a + tjíbí=gé]
   house + dust+suf

* High is realized as descending following most nuclei of inherent descending tone:

pɔ̃-zi:=rɛ̃ 'dog hair' (240)
[pɔ̃=ɔ̃̀ + sí:=ré]
dog + fur+suf

* Mid is realized as high frequently following high and low tones, always following mid tone, and sometimes following rising tone:

1. **pí:-sjɛ̃́:=rɛ́** 'childish talk'
   [pjà + sjɛ̃:=rɛ]
   child + words+suf

2. **tã̀?ã̀nã́-dí:=gé** 'sour-fruit tree' (241)
   [tã̀?ã̀nã́=mã́ + ti:=ge]
   sour-fruit + tree+suf

3. **sjɛ̃:-fɛ́lɛ́=gé** 'ethnic group'
   [sjɔ̃: + fele=ge]
   person + kind+suf

* Mid is realized as descending more frequently following inherent descending tone:

tũmɔ̃-mɛ̃:-nɛ̃̂ 'wire' (242)
[tũmɔ̃=rɔ̃ + mɛ̃:=nɛ̃]
iron + cord+suf

* Mid remains mid less frequently following high, low, and descending tones, more frequently following rising, but never following mid tone.

1. **nyũ̀-djãnã** 'skull'
   [nyũ̀gɔ̀ + tjã=nã]
   head + egg+suf

2. **tjɛ̂-kpa=?a** 'divination house' (243)
   [tjɛ́nɛ́gɛ́ + kpa=?a]
   market + house+suf

3. **zɛ̃-ŋɔ̃nɔ̃** 'lightning'
   [zà=?á + ŋɔ̃nɔ̃]
   rain + knife+suf

* Low is realized as high most frequently following nuclei of low and rising tones, less frequently following high and mid tones, and rarely following inherent descending tone.

1. **gò-nyű̃=gó** 'chicken head'
   [gòlõ + nyű̃=go]
   chicken + head+suf
2. **sɛ́-lɔ̃=ʔɔ́** 'honey'
   [sârîga + lɔ̃=ʔɔ̃
   bees + water+suf
3. **pɔ̃̀-nyű̃=gó** 'dog head'
   [pɔ̃=ɔ̃̀ + nyű̃=gò]
   dog + head+suf

(244)

* Low is realized as mid most frequently following nuclei of mid tone:

nîbɔ̃-nã̀=ɔ̃̀ 'stranger' (man) (245)
[nîbɔ̃=ɔ̃ + nã̀=ɔ̃̀]
stranger + man+suf

* Low remains low most frequently following nuclei of high and descending tones, less frequently following low and rising tones:

1. **sjɔ̃:-kõ=lõ** 'saddle'
   [sjɔ̃=ʔɔ̃ + kõ=lò]
   horse + chair+suf
2. **mɛ̃̀ʔɛ̃̀-gbè:=lɛ̀** 'fishing pole' (246)
   [mɛ̃̀ʔɛ̃̀=nɛ̃̀ + kpè:-lɛ̀]
   fishing tackle + staff+suf
3. **kpɛ̃̌:-nã̀=ɔ̃̀** 'brass worker'
   [kpɛ̃̌:=ɔ̃ + nã̀=ɔ̃̀]
   brass worker + man+suf

* Descending is realized as high always following level tones: high, mid, low, and frequently following rising tone:

1. **ñ-sálí=gá** 'cowhide'
   [nɔ̃̀: + sali=gà]
   bovine + skin+suf
2. **tjɛ́-kṍlṍ=gó** 'market road' (247)
   [tjɛ̃́nɛ̃́=gɛ́ + kolo=gò]
   market + road+suf
3. **zɛ̌-sṍlɔ́mɔ́** 'hail'
   [zà=ʔa + solo=mɔ̀]
   rain + salt+suf

* Descending is realized as mid rarely following rising tone:

kpã̌:we:=lɛ 'village gate' (248)
[kpã: + we:=lɛ̀]
entry + hole (small)+suf

* Descending remains descending always following inherent descending tones:

pulo-tjã̀: 'slave woman' (249)
[pulo=õ + tjɔlɔ̀ɔ̀]
slave + woman

* Rising remains rising always following level tones: high, mid, low, and rarely following a nucleus of inherent descending tone:

1. **sɔ̃-nyɔ̌=nɔ̃** 'deer track'
   [sɔ̃=ɔ̃ + nyɔ̌=nɔ̃]
   deer + track+suf

2. **so-nyɔ̌=nɔ̃** 'elephant track'
   [solɔ̃ + nyɔ̌=nɔ̃]
   elephant + track+suf

(250)

3. **kɔ̃-gǎ=nǎ** 'monkey tooth'
   [kɔ̃lɔ̃ + gǎ=nǎ]
   green monkey + tooth+suf

* Rising is realized as descending following descending tone:

tũmɔ̃-gã:=nǎ 'iron rod' (251)
[tũmɔ̃=rɔ̃ + kàgǎ:=nã]
iron + stick+suf

Margin-core subtype 1b is identified by the phonological criteria of predominantly low allotones on the initial margin nucleus and by the stable tone which predominantly occurs on the second nucleus. In some cases descending tone occurs on the second nucleus. Nucleus 1 is the precore margin, and nucleus 2 is the core.

Of eighteen different recorded sequences, twelve carry low tone on the first nucleus. Of these, nine are allotones of other tones and three are the inherent low tone. Six examples are given below in which subtypes 1a and 1b are shown in contrast. The underlying form is given in each case:

(252)

subtype 1a	subtype 1b
1. **kpa:-wɛ̃:=lɛ́** 'door way' [kpa=ʔa + we:=lɛ̀] house + hole+suf	2. **tɔ̃-zogi=lo** 'ankle' [tɔlɔ=gɔ + sogi=lo] leg + connection
3. **mɛ̃ʔɛ̃-mɛ̃́:=nɛ̃́** 'fishing line' [mɛ̃ʔɛ̃=nɛ̃ + mɛ̃́:=nɛ̃́] fishing tackle + cord+suf	4. **kã-yũ:=ô** 'thief' [kà: + yũ:] some + steal+suf
5. **sjɛ̃́:-djo:-tɛ́=ʔɛ́** 'firm words' [sjɛ̃́:=rɛ + djo: + tɛʔɛ̂] words + speak + place+suf	6. **sjɛ̃́:-djo:-tɛ=ʔɛ̀** 'speaking place' [sjɛ̃́:=rɛ + djo + tɛʔɛ̀] words + speak + place+suf

High allotones occur on the second (core) nucleus of numbers 1, 3, and 5, which belong to subtype 1a. On the other hand, stable tones occur on the second (core) nucleus of numbers 2, 4, and 6, which belong to subtype 1b. The two subtypes also contrast in the types of allotones on the initial nucleus: stable tones are manifested in numbers 1 and 3 of subtype 1a; whereas low allotones are manifested in numbers 2 and 4 of subtype 1b.

On the grammatical level, both core nuclei of numbers 1 and 3 are nouns, while core nuclei of numbers 2 and 4 of subtype 1b are both nouns and verbs. However, most core nuclei of subtype 1b are verbs.

The trinuclear compounds in 5 and 6 are cited here because the compound stress is the only phonological difference between them. The two examples differ lexically. In the literal translations, the English stress is marked by underlining. Both examples have a binuclear complex precore margin. In number 5, the high allotone marks the final nucleus. In number 6, the inherent descending tone marks the final nucleus.

The most frequent realization of each combination is given in the top row of each sequence in chart 26.

Chart 26

REALIZATIONS OF TONE SEQUENCES OF COMPOUND SUBTYPE 1b

NUCLEUS 1	NUCLEUS 2				
	H	M	L	D	R
H			H-L		
M	M-D L-H M-H	M-D M-M	L-L	L-D M-D	M-R L-H L-M
L	L-H	L-D L-M	L-L		
D	L-H	M-M	L-L	L-D	
R					

No evidence has been found that high tone may be realized as a lower tone on the initial nucleus (see top row). Initial high and most non-initial tones remain stable. All low tones remain stable. The examples carrying initial low tones are included here because of the grammatical evidence of prefixes.

1. **sǐ-dágá=lá** 'skepticism'
   [sǐ + tágá]
   neg + believe+suf

2. **ká-fala-sǐ-djǐ=nɛ̃** 'whirlwind'
   [ká-fala-gà + sǐ + djǐ] (253)
   wind + neg + entering+suf

3. **ni-nyã:ri=ɔ** 'wanderer'
   [ni + nyã:ri]
   human + wander+suf

4. **kà-gɔlɔ̃ na** 'aside'
   [kɔlɔ̃ + kɔlɔ̃]
   hand + hand on

5. **sǐ-bǐrǐ=gè** 'wilderness'
   [sǐ + pǐri]
   neg + become tender

The initial nuclei are realized as follows:

* Mid is realized as low most frequently preceding low tones, and sometimes before high, descending, and inherent rising tones:

1. **wì-mā** 'to him'
   [wi + mā]
   him + to

2. **wì-yɛ̀** 'himself'
   [wi + yɛ=ʔɛ̀]
   him + face

(254)

3. **tjē-fū=rō** 'fever'
   [tje=re + -fú-]
   body + hot

4. **tɔ̄-vori=go** 'ankle bracelet'
   [tɔlɔ=gɔ + foro]
   leg + pass through + suf

* Mid remains mid always preceding inherent mid tone, and mostly preceding inherent high tone:

1. **wi-kpa=ʔà** 'his house'
   [wi + kpa=ʔa]
   his + house+suf

2. **ni-kpa=ʔà** 'home'
   [ni + kpa=ʔa]
   human + house+suf

(255)

3. **ya-we:=lē** 'animal'
   [yari=ga + wé:gé]
   thing + to live+suf

4. **ni-kã̄ʔã̄=ɔ̃̀** 'totem spirit'
   [ni + kã̄ʔã̄]
   human + amaze (supernatural)+suf

* Low and high remain stable:

sɪ̀-lì: 'fasting' (256)

[sɪ̀ + lì:]
neg + to eat

* Descending is realized as low preceding high, low, and descending tones:

sì-sjɔ̃̀:=rɔ̄ 'leftovers' (food) (257)

[surò + sjɔ̃́:]
food + stay-overnight+suf

The noninitial nuclei are realized as follows:

* High remains high following all tones except sometimes following mid tone:

1. **sɪ̀-dágá=lá** 'unbelief'
   [sɪ̀ + tágá]
   neg + to believe+suf

2. **ni-kã̄ʔã̄=ɔ̃̀** 'totem spirit'
   [ni + kã̄ʔã̄]
   human + amaze (supernatural)+suf

(258)

* High is realized as descending tone sometimes following mid tone:

ni-we:=ō 'human being' (259)

[ni + wé:=gé]
human + to be alive+suf

* Mid is realized as descending frequently following mid or low tones:

ni-kpa=ʔâ 'home' (260)

[ni + kpa=ʔà]
human + house+suf

* Mid remains mid sometimes following mid and low tones and following inherent descending tone:

1. **nì-labala=ɔ** 'stupid person' 2. **su-sɔʔɔ=ɔ** 'a cook' (261)

[nǐ + labala] [su=rò + sɔʔɔ]
human + to be stupid food + to cook+suf

3. **sǐ̀-gba:** 'without drinking'

[sǐ̀ + gba:]
neg + to drink

* Low and descending remain stable:

1. **nì-yìlǐ=ô** 'boyfriend' 2. **pɛ̀-yɛ̂** 'themselves' (262)

[nì + yìlǐ] [pe + yɛ=ʔɛ̀]
human + suf their-face/front

* Rising is realized as low or rising following inherent mid:

nì-kpǎ̀lɛ̃̀ ~ nì-kpǎʔã́ 'entrance hall' (263)

[ni + kpǎʔã]
human + entrance

* Rising becomes mid following low tone:

kà-fala-sǐ̀jǐ̄=nɛ 'whirlwind' (264)

[ká-fala=gà + sǐ + jǐ̄=nɛ]
wind + neg + entering + suf

(b) Core-margin subtypes are of two kinds, designated 2a and 2b.

On the phonological level, 2a is realized as the initial nucleus, characterized by stable tones. The second nucleus is marked by allotones which assimilate to the core. On the grammatical level, the core nuclei are nouns or verbs, and the postcore margin nuclei are usually verbs.

On the phonological level, 2b is realized as the initial nucleus, characterized by descending tones, in this case high-descending. The second nucleus is characterized by stable tones. On the grammatical level, the nuclei are identical adjectives or adverbs.

Subtypes 2a and 2b are differentiated by the tones on the initial nuclei. The initial nuclear tone, high-descending, occurs on 2b but never on 2a. These subtypes are also distinguished by their grammatical components.

2a 2b (265)

1. **tá-tjɛ̃̀=rà** 'good ground' 2. **tɛ̃́:rí-dã:ri** '15 francs each' or 'by threes'

[tárà + tjɛ̃̀] [tã:ri + tã:ri]
ground + good+suf three + three

Core-margin subtype 2a is identified by its predominantly stable tones of both nuclei, and by the assimilated allotones which occur on the postcore margin nuclei in certain sequences. Mid allotone occurs on the second component of a sequence of inherent mid-low tones. Normally,

allotones occur on both nuclei in sequences in which the first component bears inherent descending tone.

Subtype 2a is distinguished from 1a by the types of allotones which occur on the second nucleus. In subtype 1a the allotones are predominantly high. On the other hand, they are never high in 2a, but are mid or descending allotones. The high tones which occur on the second nucleus of subtype 2a are the inherent high tones of the nuclei. These types are also distinguished grammatically. The second nucleus of 1a is a noun, and of 2a usually a verb.

1a		2a		(266)
1. **djeli-gɔ̃lɔ̃**	'other side'	2. **djo:-gã:=nã**	'promise'	
[djeli + kɔlɔ̃]		[djo: + kã:]		
to cross + hand		to say + to give+suf		

In number 1, the second nucleus of inherent descending tone is realized as high. In number 2, the mid tone of the second nucleus remains mid. However, should this be a subtype 1a compound, the second nucleus of inherent mid tone would become high tone following mid on the first nucleus.

Subtype 2a is distinguished from 1b by the low allotone of the initial nucleus of 1b in contrast to the stable tone of the initial nucleus of 2a. The latter is stable, with one exception which will be explained below.

1b		2a		(267)
1. **kɔ̃-zogi=lo**	'wrist'	2. **ka-tjɛ̃̀=nɛ̃̀**	'good deed'	
[kɔlɔ̃ + sogi=lo]		[ke:=lẽ + tjɛ̃̀]		
hand + connection		affair + good+suf		

Chart 27

REALIZATIONS OF TONE SEQUENCES OF COMPOUND SUBTYPE 2a

NUCLEUS 1	NUCLEUS 2				
	H	M	L	D	R
H	H-H	H-M	H-L		H-R
M	M-H	M-M	M-M		M-R
L	L-H	L-M	L-L		L-R
D	M-D	M-D	M-L		M-D
	D-H	M-M			
		D-M			
R	R-H	R-M	R-L	R-M	

In number 1 of example 267, the inherent descending tone is realized as low on the first nucleus when it precedes the mid tone of the second nucleus. In 2a, the first tone does not change.

In chart 27, the underlying tone of nucleus 1 is given in the vertical column at the left, and of nucleus 2 in the top horizontal line. The nuclear tones which are morphotonemes in the compound are underlined. The tone of the grammatical suffix is the same as that of the final nucleus, except following the final high nucleus, when the phonemic high tone suffix is realized as phonetic mid or high. The suffix is sometimes part of the final nucleus and sometimes the phonological satellite. The grammatical suffix is underlined in the following examples.

	Nuc Nuc		Nuc Nuc Sat	(268)
1.	**pì:-pílé** 'small child'	2.	**sjɛ̃:-kpɔ́:=ɔ** 'important person'	
	child + small		person + enlarge+suf	

The allotones which occur are the result of the core component spreading over the entire compound. This results in the following realizations of the tones of the nuclei:

* High, mid, and rising tones on the second nucleus are realized as descending following inherent descending tone:

			(269)
1.	**solo-gã:=nȁ** 'rock salt'	2. **fũ-bɛ̃:=rɛ̀** 'grief'	
	[solo=mɔ̀ + gȃ:=nã]	[fũ=gɔ̀ + bɛ̃:]	
	salt + post	inside + to displease+suf	

3. **ka-tjã=ɔ̀̃** 'wise person'
   [ke:=lɛ̀ + tjȃ̃]
   affair + know+suf

* Low tone is realized as mid following mid tone:

sjɛ̃:-tjã=ɔ̃ 'good person' (270)
[sjɔ̃: + tjã̄]
person-good

In words with inherent descending tone on the initial nucleus, the descending tone is realized as mid allotone in most cases. There are some exceptions:

tɛ̀:-tɛ́nɛ́=gɛ́ 'seat' (271)
[tɛ=ʔɛ̀ + tɛ́:]
place + to sit+suf

In all other combinations of tones of this type, the inherent tones (underlined) do not change.

	Inherent Tones	Realization	(272)
[H + M] = H + M	[fjá: + tɔ́nɔ́]	**fá-tɔ́nɔ́=ɔ** 'long fish'	
	fish + to be long		
[M + H] = M + H	[sjɛ̃:=rɛ + fɔ̃́]	**sjɛ̃:-fɔ̃́=rɔ́** 'new words'	
	words + new		

[L + M] = L + M	[kà=ʔà + nɛʔɛ]	**kɛ̀-nɛʔɛ=yɛ**	'many villages'
	village + many		
[R + L] = R + L	[gǎ=ná + fî:]	**gǎ-vî:=lɛ̀**	'white tooth'
	tooth + white		
[F + L] = F + L	[ke:=lɛ̀ + tjǎ]	**ka-tjǎ=nǎ**	'good deed'
	affair + good		

Core-margin subtype 2b is identified by the stable tones of the second nucleus and the possible high-low allotones on the initial nucleus. The initial nucleus is the core; the second nucleus is the postcore margin.

tjɛ̀:rî-tjɛ̀:rî 'very little, very few' (273)
[tjɛ̀:rî + tjɛ̀:rî]
small + small

sî:-zî: 'by twos, 10 francs each'
[sî: + sî:]
two + two

On the grammatical level, it is also identified by the repetitive adverbs or adjectives.

The high-low allotones occur only on basic forms of words bearing inherent level mid or low tones. Words of high, descending, or rising tones, or sequences of tones remain stable. They are included in this subtype because of the grammatical identification and the fact that they are repetitive.

kɛ̂lɛ̀-kélɛ̀ 'quickly' (274)
[kɛ̀lɛ́ + kɛ̀lɛ́]
quick + quick

kɔ̀rɔ̂-tã:ri-dã:ri '40 francs each'
[kɔ̀rɔ̂-tã:ri + kɔ̀rɔ̂-tã:ri]
eight + eight

(c) Complex core binuclear subtypes. There are two kinds of complex core subtypes, designated 3a and 3b.

On the phonological level, 3a is realized as the initial nucleus, characterized by predominant high allotones. The second nucleus is characterized by possible descending allotones. A predominant high-descending tone sequence carries over the entire compound. On the grammatical level, initial nuclei are prefixes which can sometimes be identified as nouns, and second nuclei are predominantly nouns, although verbs do occur.

On the phonological level, 3b is realized as having the initial and second nucleus characterized by stable tones. On the grammatical level, both nuclei are verbs. In fact, the entire compound word may function as a noun or as a verb.

In other words, the two above subtypes are normally differentiated by stable tones on both nuclei of subtype 3b in contrast to unstable tones on both nuclei of subtype 3a.

(275)

3a	3b
1. **ká-nyɛ=ʔɛ̀** 'truth'	2. **kpárá-tjɔ̀=gɔ̀** 'patience'
[ke:=lɛ̀ + nyénégɛ́]	[kpárá + tjɔ̀]
affair + to be red+suf	press + catch-hold+suf

In number 1, the inherent descending tone of the initial nucleus is realized as high, and the inherent high tone of the second nucleus as descending. In number 2, the tones of both nuclei remain stable.

Complex core subtype 3a is identified by predominant high allotones on the initial nucleus and by predominant descending allotones on the noninitial nucleus. Both are core nuclei. Out of twenty-four different tone sequences recorded, high tones occur on twenty of the initial nuclei. Of these, fourteen are phonetic realizations of other tones. Descending tones occur on twelve of the second nuclei. Of these, eight are phonetic realizations of other tones.

Subtype 3a and 1a differ in the placement of the high allotones which mark the core. In subtype 3a, they are placed on the initial nucleus, and in 1a they are placed on the final one. Also, in 3a final nuclei of descending tone remain descending, while in 1a the descending tones are always realized as high allotones.

(276)

1a	3a
1. **tjé-kɔ̃́lɔ́=gɔ́** 'market row'	2. **lɔ̃-kolo=gɔ̀** 'stream'
[tjɛ̃́nɛ̃́=gɛ́ + kolo=gɔ̀]	[lɔ̃=ʔɔ̃ + kolo=gɔ̀]
market + road+suf	water + road+suf

In number 1, the high allotone is a phonetic realization of the inherent descending tone of **kologɔ̃.** In number 2, the high allotone is a phonetic realization of the low tone of the first nucleus **lɔ̃ʔɔ̃,** while the second nuclear descending tone remains descending.

Subtypes 3a and 1b differ in the kinds of tone change on the initial nucleus. In compounds of 3a, the tone on the prefix is primarily low, whereas in 1b it is primarily high.

(277)

1b	3a
1. **sī-sjɔ̃̄:=rɔ́** 'leftovers'	2. **sī-sjɔ̃:=rɔ̀** 'flies'
[su=rɔ̀ + sjɔ̃́:]	[su=rɔ̀ + sjɔ̃:ri]
food + stay overnight+suf	food + suck in+suf
3. **kā-fu=go** 'outside'	4. **ká-fu=gɔ̀** 'heat'
[kā + fū]	[ká + fú]
village + hot+suf	pref + hot+suf

In 1, the initial nuclear descending tone is realized as low and the nucleus is the margin, whereas in number 2 it is realized as high and the nucleus is the core. Furthermore, the second nucleus remains high in number 1, but it takes the predominant descending allotone of subtype 3a in number 2.

Subtype 3a differs from subtype 2a in the initial nuclear components by the predominant high allotones in 3a whereas 2a the initial nucleus is always stable except for descending tones (see above). Furthermore, 3a final nuclear tones are realized as predominant descending tones, whereas 2a final nuclear tones are realized as assimilating allotones. Allotones in 2a are not descending unless they assimilate to preceding nuclei of inherent descending tones.

(278)

2a		3a	
1. **ka-tjã̀=nã̀** 'good deed'		2. **ká-nyɛ=ʔɛ̀** 'truth'	
[ke:=lè + tjã̀]		[ke:=lè + nyɛ́nɛ́gɛ́]	
affair + good+suf		affair + to be red + suf	
3. **ye-wɔ=ʔɔ̃** 'October'		4. **yé-bili=mɛ̃̀** 'darkness'	
[ye=ʔè + wɔ́:]		[ye=ʔè + pĩlĩ=gè]	
month + blacken+suf		moon + night+suf	

The descending tones of the initial nucleus are realized as mid tone in numbers 1 and 3 of the 2a subtype, whereas they are realized as high tone in 2 and 4 of the 3a subtype. Furthermore, the final nuclei of 1 and 3 retain their inherent tones of low and descending, whereas high tone is realized as mid in 2 and low as descending in 4. It is to be remembered that the descending tone always spreads over the following suffix.

Subtype 3a differs from subtype 2b in the initial nuclear components. In the latter, the tone is realized as high-low, or nonchanging, whereas in the former it is never realized as high-low, but as predominantly high tone. The final nucleus tones of 2b are stable, while they may be mid or descending in subtype 3a.

(279)

2b		3a	
1. **tã̃:rí-dã:rí** 'by threes'		2. **yã́-ti:=gè** 'neck'	
[tã:ri + tã:ri]		[yari=ga + ti:=ge]	
three + three		thing + tree+suf	

In number 1, the mid tone of the initial nucleus is realized as high-low, whereas in number 2, the mid tone is realized as high. The final nuclear mid tone in number 1 remains stable, but in number 2 the final nuclear mid tone is realized as descending.

In chart 28, the underlying tones are listed on the first vertical column for the first nucleus and on the top horizontal line for the second nucleus. The underlines indicate the tones which have changed in the compound forms.

Chart 28

REALIZATIONS OF TONE SEQUENCES OF COMPOUND SUBTYPE 3a

Nucleus 1	Nucleus 2				
	H	M	L	D	R
H		H-M H-D	H-D H-M H-L		H-R
M	H-H H-D	H-M H-D	H-M	H-D	
L	H-D	H-D	H-L	H-D	H-R
D	H-D	H-M H-D	H-M H-D H-L H-R	H-D	H-R H-M
R		R-D	R-D R-M	R-D	

* Except for rising tone, the tones of the initial nuclei (reading the columns of the chart across), are realized as high.

(280)

H = H

1. **sī-tjīlī=mɛ̃** 'intelligence'
   [sī + tjīlī=gɛ̀]
   pref + to be intelligent+suf

M = H

2. **yá-ti:=gɛ̀** 'neck'
   [yari=ga + ti:=ge]
   thing + tree+suf

L = H

3. **lɔ̃-kpaːˇ** 'bridge'
   [lɔ̃=ʔɔ̃ + kpa=ʔa]
   water + house

D = H

4. **sī-sa=rà** 'nãra sauce spice'
   [su=rɔ̀ + sã]
   food + bear-fruit+suf

but:

R = R

5. **gālá-dí:=gɛ̀** (~ **gālà-dī:=gɛ́**) 'indigo plant'
   [gàlá + ti:=ge] ~ [gālà-ti:ge]
   indigo + tree+suf

The tones of the nuclei in second position are realized as predominant descending tones. The examples below follow the vertical columns on the chart.

* High is realized as high sometimes following inherent mid tones, and always following inherent descending tones.

1. **nī-tő:** (~ **ni-to:̄**) 'father' 2. **yā-gwɔ:=lɔ̃** 'only (pl)' (281)

[ni + tő:] [yari=ga + kwɔ̃:]
human + father thing + to finish

3. **kā-fu=gō** 'heat'

[ke:=lê + fū]
affair + hot

* Mid is realized as mid often following inherent mid or descending, and descending always following inherent low tone and often following inherent mid tone.

1. **yā-kpo=lo** 'voice' 2. **fí-nā:=nâ** 'nose' (282)

[yari=ga + kpo=lo] [fĩnɛ̃=mɛ̃ + nã]
thing + gourd+suf mucous + arrive+suf

3. **kā-fala=gâ** 'wind' 4. **yā-ti:=gè** 'neck'

[ka:̄ + fala] [yari=ga + ti:=ge]
it-shall + to continue+suf thing + tree+suf

* Low is realized as mid sometimes following level, descending, or rising tones; descending sometimes following inherent high, descending, or rising tones; and low sometimes following inherent descending or level tones.

1. **sjɛ̃:-mɔ̃gɔ̃-nã=ɔ̃** 'paralytic' 2. **zě-djo=go** 'multimammate rat' (283)

[sjɔ̃: + mɔ̃gɔ̃ + nã=ɔ̃] [zā=ʔá + tjô]
person + to paralyze + man+suf rain + mouse+suf

3. **kpmɔ̃:-dulu=gô** 'bruise' 4. **yē-bili=gè** 'night'

[kpmɔ̃: + tūlū=gô] [ye=ʔê + pīlī=gè]
to hit + track+suf moon + night+suf

5. **sā-kpè=lè** 'leather amulet bracelet'

[sali=gā + kpê=lê]
skin + door latch+suf

* Low tone is sometimes realized as rising:

kā-bō=ʔő 'trash-heap' (284)
[kari=gā + bō=ʔô]
fertilizer + hill+suf

* Descending tone remains descending:

nī-djā=ʔâ 'today' (285)
[mī: + tjā=ʔã]
my + day+suf

Complex core subtype 3b is identified by the stable tones on both nuclei. On the grammatical level it consists of either repetitive verbs or two different verbs. The compound form can be either a verb or a noun.

This subtype is the only one that has stable tones always in both nuclei. It is distinguished from all other subtypes by this factor.

1. **kpàrâ-tjò=gò** 'pardon, patience'
   [kpàrâ + tjò]
   to press + catch hold+suf

2. **tũ-dũ=5̃** 'messenger' (286)
   [tũ + tũ]
   send + send+suf

3. **ŋ5̃-da:=la** 'rest' (n)
   [ŋ5̃ + ta:]
   breathe + gain+suf

(2) Polynuclear compound types consist of an obligatory compound nucleus of three or four components and an optional satellite.

The polynuclear compound nucleus contains a core and a prenuclear or a postnuclear margin. Either the core or the margins or both core and margins may be complex, with two nuclei. Any combination of binuclear compounds and other nuclei seem to be theoretically possible.

The overall tone patterns of polynuclear compounds are determined by the same principles as the patterns of binary compounds:

(a) Margin-Core

margin-core (287)

1a. **pĩ:gbó:-fànĩ** 'carrying sling for child'
[pjà + gbó: + fànĩ]
child + care-for + cloth

margin-core

1b. **kũ-tí:-djo:-kpa=ʔã** 'court house'
[kútí: + djo: + kpa=ʔa]
judgment + say + house+suf

(b) Core-margin

core-margin

2a. **tũ-dũ-nɛʔɛ=bélɛ** 'many messengers'
[tũ + tũ + nɛʔɛ]
send + send + proliferate+suf (pl)

(c) Compound-core

core-core

3a. **yá-kpo-fũ̌-gã̌=gà** 'windpipe'
[yari=ga + kpo=lo + fũ=gò + ká-gã̌=ga]
thing + gourd + inside + branch+suf

core-core

kô-záʔárá-saʔara=gà 'messed up road'
[kolo=gò + sáʔárâ + sáʔárá]
road + messy + messy+suf

The tone pattern is determined by the type of tone sandhi on the core and margin components. For example, a high allotone occurs on the core component of the following compound:

Subtype 1a. margin-core (287)

kālari-kólóyó 'dividing lanes' (in town, village)

[kà=ʔà + làrì + kolo=yó]
village + to space + road+suf (pl)

In a polynuclear compound, as in the binary compound, the realization of the tones is determined not only by the compound subtype but often by the immediately preceding tone. Only the immediately preceding tone assimilates the tone of a particular component. In the following example, the component **tjã̀** 'good' in the binary compound carries a mid allotone due to the mid tone of the nucleus preceding it; however, in the polynuclear compound it remains low due to the high tone of the nuclear component immediately preceding it, even though the noncontiguous initial component of the same compound carries mid tone.

(289)

1. **kpa:-tjã=ga** 'pretty house'
[kpa=ʔa + tjã]
house + pretty+suf

2. **kpa:-kpɔ́:-tjã̀=gà** 'large, pretty house'
[kpa=ʔa + kpɔ́ʔɔ́ + tjã̀]
house + enlarge + pretty+suf

A polynuclear compound word may consist of an embedded phrase or an embedded clause. The more complex polynuclear compound words often bear stable tones, or the entire word may take on the tone of the key component.

1. **sjɛ̃̀:-fɔrɔ-gwɔ́:bɛ̀le** 'the distressed ones' (290)
[sjɛ̃́:=bɛ̀lɛ̀ñ + fɔ̀rɔ̀ñ + kwɔ́:]
person-the + tire-cp + finish-pl-cp

2. **gàrì-mà-nɔ̃̀:** 'mid-June to mid-July'
[kárí + mɔ + nɔ́:w̃ + (má)]
go + your + mother-the + (to)
(**nɔ́:w** basic tone is low: **nàfɔ́**)

3. **kū=lō-bari** 'rainbow'
[kū=lō + pari]
country + cross

4. **nyɛ̃̀=ʔɛ̃̀-na-gwɔ́:** 'day after tomorrow'
[nyɛ̃̀=ʔɛ̃̀ + na + (gá) + kwɔ́:]
dawn + on + (cond) + finish

Example number 1 corresponds to the binuclear core-margin subtype 2a. The initial core is complex and corresponds to a grammatical noun phrase.

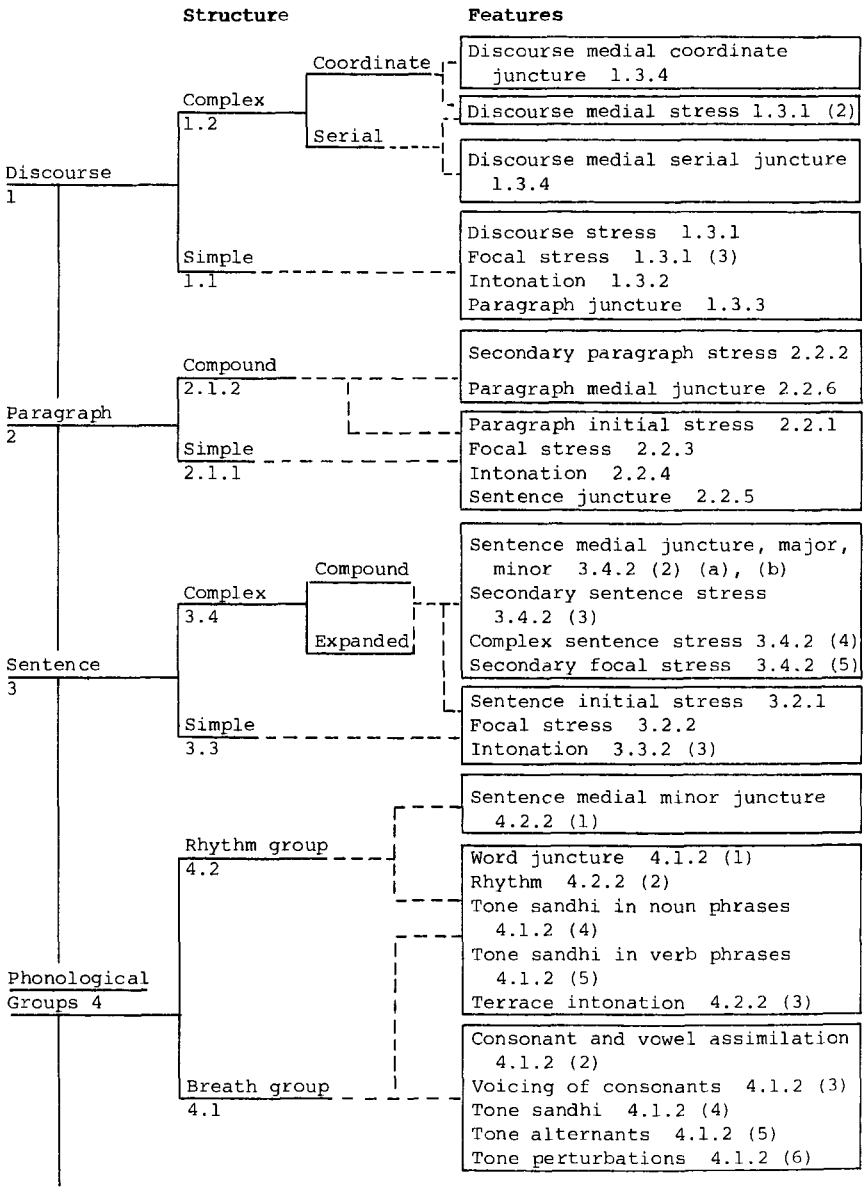
Number 2 is a solid compound. Its initial complex nuclear component is an expanded word comprised of a verb and a pronoun. Vowel sandhi occurs on the pronoun **mɔ**, causing it to become **mà** to agree with the preceding verb **gàrì**. The complex initial nucleus changed to low tone to agree with the inherent low tone of 'mother'. This compound word, which is a name for the month of July, contrasts in tone with the compound word which is the name of the month of November:

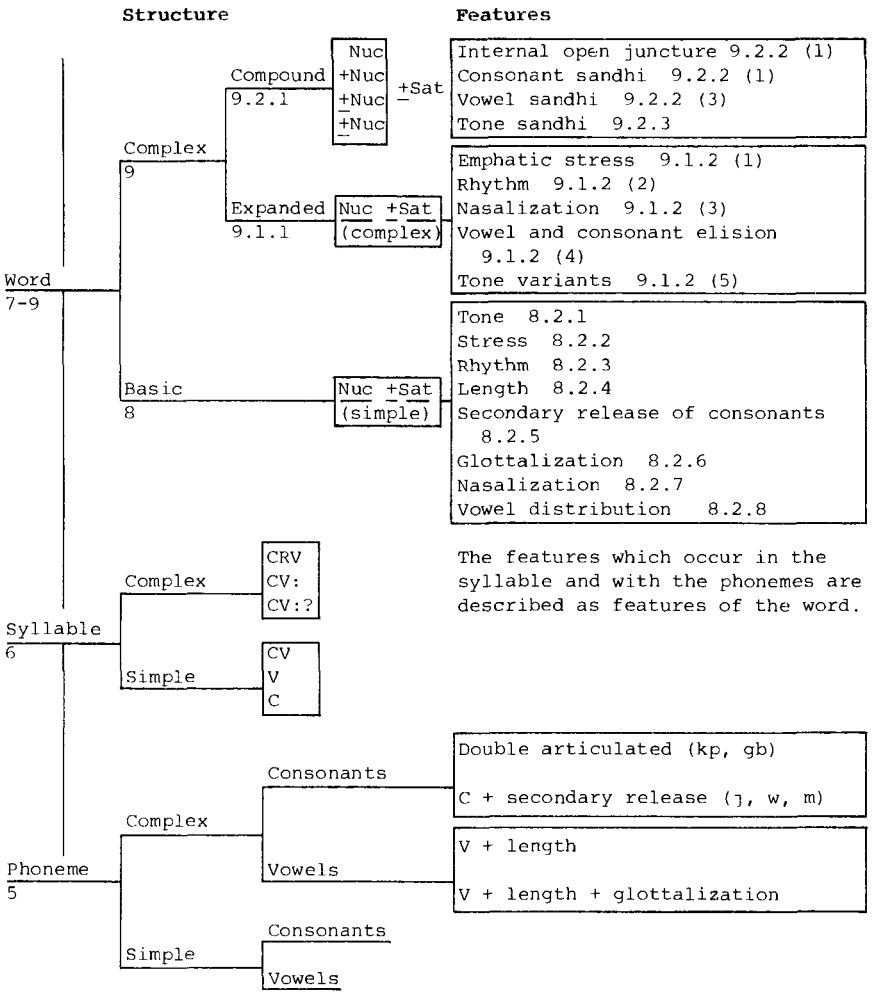
kárímá-tó: 'August to September' (291)
[kárí + mɔ + tó=w̃ + (má)]
go + your + father-the + (to)

The entire compound tone agrees with the high tone of the key word **tɔ́:**, whereas number 2 above bears low allotones which agree with the basic tone for 'mother'. Example 290 number 2 refers to the month when the mother's harvest is not in, when the child is to go to stay with her. **kārímá-tɔ́:** is the name of the month when the father's harvest is in, when the child goes to stay with him.

The tones of 3 and 4 in example 290 remain the same as the tones of the basic components. Particles such as tense-aspect and postpositions are elided when the clauses become compound words.

APPENDIX


Structure
Features
Discourse 1
Complex 1.2
Coordinate
Serial
Simple 1.1
Paragraph 2
Compound 2.1.2
Simple 2.1.1
Sentence 3
Complex 3.4
Compound
Expanded
Simple 3.3
Phonological Groups 4
Rhythm group 4.2
Breath group 4.1
Discourse medial coordinate juncture 1.3.4
Discourse medial stress 1.3.1 (2)
Discourse medial serial juncture 1.3.4
Discourse stress 1.3.1
Focal stress 1.3.1 (3)
Intonation 1.3.2
Paragraph juncture 1.3.3
Secondary paragraph stress 2.2.2
Paragraph medial juncture 2.2.6
Paragraph initial stress 2.2.1
Focal stress 2.2.3
Intonation 2.2.4
Sentence juncture 2.2.5
Sentence medial juncture, major, minor 3.4.2 (2) (a), (b)
Secondary sentence stress 3.4.2 (3)
Complex sentence stress 3.4.2 (4)
Secondary focal stress 3.4.2 (5)
Sentence initial stress 3.2.1
Focal stress 3.2.2
Intonation 3.3.2 (3)
Sentence medial minor juncture 4.2.2 (1)
Word juncture 4.1.2 (1)
Rhythm 4.2.2 (2)
Tone sandhi in noun phrases 4.1.2 (4)
Tone sandhi in verb phrases 4.1.2 (5)
Terrace intonation 4.2.2 (3)
Consonant and vowel assimilation 4.1.2 (2)
Voicing of consonants 4.1.2 (3)
Tone sandhi 4.1.2 (4)
Tone alternants 4.1.2 (5)
Tone perturbations 4.1.2 (6)


Structure
Features
Word
7-9
Complex
9
Compound
9.2.1
Nuc
+Nuc
+Nuc
+Nuc
+Sat
−
Internal open juncture 9.2.2 (1)
Consonant sandhi 9.2.2 (1)
Vowel sandhi 9.2.2 (3)
Tone sandhi 9.2.3
Expanded
9.1.1
Nuc +Sat
(complex)
Emphatic stress 9.1.2 (1)
Rhythm 9.1.2 (2)
Nasalization 9.1.2 (3)
Vowel and consonant elision 9.1.2 (4)
Tone variants 9.1.2 (5)
Basic
8
Nuc +Sat
(simple)
Tone 8.2.1
Stress 8.2.2
Rhythm 8.2.3
Length 8.2.4
Secondary release of consonants 8.2.5
Glottalization 8.2.6
Nasalization 8.2.7
Vowel distribution 8.2.8
Syllable
6
Complex
CRV
CV:
CV:?
Simple
CV
V
C
The features which occur in the syllable and with the phonemes are described as features of the word.
Phoneme
5
Complex
Consonants
Vowels
Double articulated (kp, gb)
C + secondary release (ŋ, w, m)
V + length
V + length + glottalization
Simple
Consonants
Vowels

GLOSSARY

Allotone. A tone which functions as a member of a toneme.

Alternant. Nonsignificant variant of a phoneme or morpheme.

Approximant. A term for the series w, y, l (Ladefoged).

Basic word. A simple form of the word. The departure point for making complex forms. It consists of a single nucleus and optional postnuclear satellite and has one initial stress and limited vowel, consonant and rhythm sequences, and is spanned by a single tone.

Binary compound word. A compound word consisting of two obligatory nuclei and an optional satellite. Each nucleus has initial stress.

Body of discourse or paragraph. The greater part of the discourse or paragraph. Situated between the initial and final margins, it contains the focal peak and the linking portions on each side which build up to and lead away from it.

Breath group. A phonological utterance immediately above the word level. It contains a sequence of two or more phonological words not broken by a breath, and is a component of the phonological group.

Characterizing feature. Prosodic or suprasegmental features which characterize words and higher levels, marking their boundaries. Some examples are: nasalization, tone, rhythm, length, intonation.

Closed juncture. A transition not marked by pause occurring between syllables in a polysyllabic long rhythm unit within a word. Others are semiopen juncture and internal open juncture.

Cohesive feature. See **Characterizing feature** and **Demarcative feature** with which it is synonymous. It may be phonemic or nonphonemic.

Complex word. A basic word plus added sequences of tones, vowels, or consonants. It has two subtypes: expanded word and compound word.

Complex sentence. An utterance bearing a complex sentence intonation contour bordered by sentence juncture. Subtypes are expanded and compound sentences.

Compound paragraph. A paragraph comprising two or more sentences which constitute two components separated by minor juncture. The first component bears initial paragraph stress and the second bears secondary paragraph stress.

Compound word. An utterance bounded by word juncture and consisting of two to four stressed nuclei separated by internal open junctures plus an optional satellite.

Concord suffix. Noun suffixes which agree as to semantic class and number.

Consonant pattern. Consonant sequence.

Consonant sandhi. Allomorph whose form is dictated by phonetic environment. Realized as progressive and regressive assimilation.

Core. The dominant component on a compound nucleus in a compound word.

Delayed release. See **Secondary release.**

Demarcative feature. A suprasegmental feature which serves to mark the boundaries of words. A cohesive feature, nonphonemic unless otherwise specified.

Discourse, phonological. The highest level of phonology treated in this book. Texts larger than a paragraph and having a phonologically identifiable initial margin, body, and final margin.

Discourse initial stress. See **Initial stress.**

Discourse medial juncture. A pause occurring between two components of a complex discourse and accompanied by a great difference in pitch of the high tones of the words contiguous to it, the high tone following the juncture being higher than that preceding it. The discourse medial stress following the discourse medial juncture is stronger than the paragraph initial stress following a paragraph juncture. Subtypes: parallel medial juncture, serial medial juncture.

Discourse medial stress. Initial stress on each noninitial subdiscourse component of a complex discourse. It is manifested less strongly than the initial stress of the initial subdiscourse.

Distinctive feature. In this study, used mainly as a term synonymous with **Phonemic prosody** (which see). It is also used in a section under Compound Words in the usual sense of features of consonants and vowels such as acute, compact, diffuse, or grave.

Distinctive prosody. Suprasegmental feature of words and higher levels which distinguishes meaning and is therefore phonemic.

Distribution of vowels. See **Vowel distribution.**

Duration variants. Nonphonemic variants of length of either short or long vowels or consonants.

Emphatic stress. A cohesive feature of the expanded word, occurring only accompanying deictic suffixes (demonstrative and definite) in nouns. It manifests concentration of intensity and speed on the final stem and suffix, and also the widening of the interval between the higher and lower pitches of their tones. The latter is done by raising by one tone the pitch of the tone of the syllable immediately preceding the suffix and by lowering the pitch of the low tone of the suffix.

Expanded word. A subtype of the complex word, it consists of a single stressed nucleus with optional postnuclear satellite and has complex sequences of consonants, vowels, tones, rhythm or other features.

Feature. In this work, synonymous with **prosody** when it characterizes levels above the syllable. See also **Distinctive feature.**

Focal paragraph. The paragraph containing the phonological focal stress and the grammatical peak or climax of the discourse or subdiscourse.

Focal point. The place of the strongest manifestation of the focal stress.

Focal sentence. The sentence bearing the focal stress of the paragraph and which contains the paragraph's grammatical peak. It may be the focal point of a discourse or subdiscourse.

Focal stress. The phonological manifestation of the grammatical peak or climax of a sentence, paragraph, subdiscourse, or discourse. In complex sentences, both primary and secondary focal stresses may exist. Focal stress is realized as loudness, deceleration of speed of utterance, higher pitch of high tones and possible lower pitch of low tones

resulting in a broader span between high and low tones. This may spread over one word in a sentence, over a phonological group or sentence in a paragraph, or over a paragraph or several paragraphs in a discourse or subdiscourse.

Focal subdiscourse. The subdiscourse bearing focal stress of a complex discourse. In comparison to the other subdiscourses it manifests wider spans between high and low tones: its focal point is higher and louder than that of other subdiscourses.

General pronoun. A noun substitute which has no added meaning. The opposite is the specific pronoun, which has both a deictic meaning and an exclusive meaning, e.g., **ki** 'it' (general) versus **korò** 'the one to which I referred' (specific); and **wò** 'we, any or all of us' (general or inclusive) versus **wòlò** 'we, certain of us' (specific or exclusive).

Glottalization. A prosody of the word. The interruption of a long vowel by a glottal stop and its resumption after the stop.

Grammatical juncture. A transition between a grammatical stem and suffix realized as added nonphonemic length on the vowel and consonant on each side of the border.

Hierarchy, phonological. A part-whole relationship between sounds and their including structures (Pike); (i.e., syllables, parts of words; words, parts of phonological groups; phonological groups, parts of sentences, etc.).

Initial stress. A nonphonemic feature of the levels above the word, such as phonological group, sentence, paragraph, and discourse. It is manifested as loud volume, high pitch of the tones, and deceleration of speed. In levels above the phonological group, it is also realized as a greater interval between pitches of the high and low tones. It occurs on the initial part of the utterance. The degree of the manifestation determines whether it is discourse initial stress or that of the paragraph, the sentence, or the phonological group.

Internal open juncture. A pause between two rhythm units, both of which bear word stress. It is a feature of the compound word.

Interval, width of. The musical span between two tones. The width of interval helps to determine the placement of initial stress, focal stress, linking parts and margins of sentences, paragraphs, and discourses.

Intonation. A prosody of the hierarchical levels above the word, realized as level or terrace intonation contour. It consists of raising or lowering the pitches of tones of words or groups of words so that each successive intonation unit (word or group of words) is on a higher or lower level than the preceding one (terrace intonation), or is on the same level (level intonation). In level intonation, all high tones are realized on the same pitch, with the exception of stress points and final margin, and all low tones are on the same pitch as the first low tone. In descending terrace intonation, the pitches of intonation units descend in steps or terraces, and in ascending intonation, they ascend in steps or terraces. See **Intonation contour.**

Intonation contour. A distinctive feature of the sentence and a nondistinctive feature of the paragraph and discourse. Intonation contours overlie the phonemic tones of individual words. Within each intonation unit (including words and groups of words), the high, mid, and low

tones are distinct pitches relative to each other. All the tones may be raised or lowered in a succeeding unit so that the complete unit is higher or lower than the preceding one. This occurs in a terrace intonation contour which may be of the ascending or the descending subtype. Subtypes of intonation contour: terrace, level. See also **Intonation, Terrace intonation contour, level intonation contour.**

Intonation level. Relative height of the musical pitches of tones of words or groups of words, so that an utterance may be on a high intonation level, a medium intonation level, or a low intonation level relative to the medial level of a person's speech.

Isochronic realization. A term applied to verse in which the amount of time between two primary stresses tends to be the same irrespective of the amount of material between them (Mario Pei). In Senoufo words, the time between open juncture and semiopen juncture, or between two open junctures tends towards the same duration. In monosyllabic words, irrespective of the presence or absence of the length feature, the time between two open junctures tends toward the same duration; and in long rhythm units, irrespective of the number of syllables, the time between open and semiopen juncture tends to be the same, e.g., **tya:=na** 'to spin', **tyana=na** 'cutting' (n.). The long rhythm units **tya:** and **tyana** approach the same length.

Juncture. A transition between two components of an utterance. It comprises a bundle of sound qualities contiguous to a pause. The pause may be optional or obligatory according to the type of juncture. See also **Closed juncture, Internal open juncture, Prefinal juncture, Semiopen juncture, Open juncture, Word juncture, Discourse medial juncture, Paragraph juncture, Paragraph medial juncture, Sentence juncture, Sentence medial juncture.**

Length. A phonemic prosody of the word, realized as a long vowel.

Level intonation contour. Occurrence of high tones on the same relative pitch throughout an utterance, or of low tones on one pitch level throughout an utterance. In paragraphs and discourses manifesting level intonation contour, the higher pitches of high tones at focal stress or initial stress points do not rise above the high medial intonation level. See also **Intonation, Intonation contour, and Terrace intonation contour.**

Linking paragraph. A component of the discourse which functions as a link between the initial margin and the focus, and between the focus and the final margin. It manifests medium high to medium low intonation levels with narrow width of intervals between tones, medium-to-low volume, and medium-to-fast speed.

Margin. A usually nondominant component of an utterance. In the compound word, the margin precedes or follows the core in the compound nucleus; in the sentence, it precedes or follows the nucleus; and in the paragraph and the discourse, it precedes or follows the body. Margins are characterized by the nondominant characteristics of low allotones, assimilation of margin tones to core tones in compound words, descending intonation, acceleration of speed, close or narrow width of interval between high and low tones, and low volume in levels above the word. An exception is the initial margin of the higher levels which bear initial stress.

Marginal phonemes. Phonemes which can be proved to be phonemic in relatively few examples, perhaps three to five, and in which most occurrences can be interpreted as variants of another phoneme. In Tyebaara these are n̲, ɲ̲, and ŋ̲, which may historically have been variants of l̲, y̲, and w̲.

Nucleus. Dominant part of the word, the phonological group, and the sentence. It is manifested by its clear enunciation, higher intonation than the satellite or margin, and its relative loudness or slowness.

Open juncture. A bundle of sound qualities accompanying pause. A stressed syllable always follows open juncture. See also **Word juncture** and **Internal open juncture.**

Paragraph initial stress. A stronger realization of initial stress than that of the sentence or paragraph. See **Initial stress.**

Paragraph juncture. A pause which is followed by paragraph initial stress and preceded by the final margin of a paragraph. The difference between the fast speed preceding juncture and the slow speed following it is particularly noticeable.

Paragraph medial juncture. A juncture between components of a compound paragraph. A pause following a sentence final intonation in the medium pitch range followed by secondary paragraph stress on the second component in the compound paragraph.

Phonemic prosody. Any suprasegmental feature that spans a word or higher level. Examples: tone, nasalization, length.

Phonological group. The hierarchical level below the sentence and above the word. An utterance comprised of more than one word and characterized by tone sandhi, reduction of consonants and vowels, consonant assimilation, word juncture, and by rhythm and terrace intonation. Subtypes: breath group and rhythm group.

Phonological paragraph. The hierarchical level below the discourse and above the phonological sentence. It comprises one or more sentences bounded by paragraph juncture and has initial paragraph stress. See also **Compound paragraph.**

Pitch. The height of different tones relative to each other and of the same tones relative to each other in different positions in an intonation contour.

Polynuclear compound word. Three to four nuclei in a compound nucleus comprise the polynuclear word as compared to the two nuclei in a binuclear compound. The polynuclear compound is an expansion of the natural two-part division of the compound nucleus, the third and fourth nuclei being added to either its dominant or its nondominant part, or to both.

Postposed. A word or particle placed after another utterance or part of an utterance to indicate its syntactical relationship.

Prefinal juncture. See **Semiopen juncture.** It precedes the postnuclear satellite of a word.

Preposed. A word or particle placed before another utterance or part of an utterance to indicate its syntactical relationship.

Progressive assimilation. A change in a unit as a result of being affected by its preceding environment.

Prosodic feature. Any feature extending over a nucleus, a word, or a longer utterance. Examples: nasalization, tone, etc. See **Feature.**

Prosody. Suprasegmental feature of an utterance larger than a syllable. It may be distinctive or nondistinctive. See **Feature.**

Quality. Identifying characteristic or a sound.

Regressive assimilation. A change in a unit as a result of its being affected by the environment which follows it.

Rhythm. A nonphonemic demarcative feature of the word. Minimal rhythm units stand alone or combine to form limited word rhythms which help to mark the boundaries of words. In the word, the syllables may be accelerated or decelerated and combined with junctures to comprise rhythms with either a regular or a syncopated beat. See also **Rhythm unit** and **Word rhythm.** Rhythm in higher levels serves to unite larger segments such as rhythm groups and set them off from other parts of the utterance. See also **Rhythm group.**

Rhythm group. An utterance of one or more breath groups which comprises a sentence or a part of a sentence. Normally the placement of new terrace levels in a terrace intonation contour marks its borders. Sentence medial juncture also may mark its border internally in the sentence.

Rhythm pattern. Synonymous with word rhythm.

Rhythm unit. One or more syllables bounded by internal or external open juncture, or by semiopen juncture and open juncture, and which constitute the minimal components of word rhythms.

Satellite. The nondominant component of a basic or a complex word. In contrast to the nucleus, it does not bear stress.

Saturation. A state where no more can be added.

Sandhi. Morphophonemic allomorphic changes. See **Consonant sandhi, Tone sandhi,** and **Vowel sandhi.**

Secondary paragraph stress. Initial stress on the second component of a paragraph. It manifests lower pitch of low tones and much higher pitch of high tones than that of the corresponding tones in the final unit of the first component. See also Graph 6 for comparison of initial and secondary stress as to the pitch of the tones.

Secondary release of consonants. A secondary feature which is added to a normal consonant whereby the tongue is raised close to the prepalatal region of the hard palate, resulting in palatalization when the following vowel is unrounded or spread, and whereby the lips are rounded, resulting in labialization when the following vowel is rounded. A nasalized labialization written as m̄ occurs when the following vowel is rounded and the syllable is nasalized.

Secondary sentence stress. Increase in volume, decrease in speed, rise in intonation initially on the second component of a complex sentence. It is less strong than initial stress on the first component.

Semiopen juncture. A bundle of sound qualities contiguous to the boundary in a word between the nucleus and the postnuclear satellite. It is realized as a small nonphonemic lengthening of contiguous vowel and consonant; quality change is also often involved in contiguous segments.

Sentence juncture. A pause followed by an utterance having initial sentence stress. There is no great decrease in speed in sentence stress as there is in paragraph stress. Sentence juncture pause is followed by an utterance having all the qualities of initial stress except that of a great decrease in speed.

Sentence medial juncture. A pause that is not as long as the pause of sentence juncture and that is often followed by secondary sentence stress. It occurs between phonological groups. Subtypes: major sentence medial juncture occurs preceding noninitial rhythm groups; minor sentence medial juncture occurs preceding phonological groups which may be either breath or rhythm groups.

Sentence, phonological. The hierarchical level below the paragraph and above the phonological group. Comprises one to four phonological rhythm groups and is characterized by one simple intonation contour, an obligatory initial stress, and optional focal stress. See also **Complex sentence.**

Sentence stress. Occurs sentence initially as higher pitch of both high and low tones than that in the final unit of the preceding sentences, and as a small increase in loudness and sometimes a small decrease in speed. See also **Initial stress, Secondary sentence stress.**

Speed. Acceleration or deceleration of rate of speech. Helps to set borders to the parts of the discourse and paragraph, and to some extent of the sentence. Slow speed also is one of the realizations of focal and initial stress.

Spread vowels. Synonymous with unrounded vowels.

Stress. A generic term for the phonological contrast between units, whether manifested by loudness, speed, or pitch. When used alone, stress refers to a nonphonemic prosody of the word and is realized as length on the initial consonant and clear articulation, but not as higher pitch of the tone or as loudness. See also **Emphatic stress, Focal stress, Initial stress.**

Stress group. Stressed nucleus plus optional satellite.

Subdiscourse. A component of a complex discourse. It is preceded or followed by subdiscourse juncture. Subtypes: serial, parallel.

Terrace intonation contour. A prosody of the hierarchical levels above the word whereby blocks of tones are articulated on successively lower or higher levels of pitch. Within each block of tone, individual tonemes are identifiable as high, mid, low, rising, or descending in relation to each other. Subtypes: ascending terrace intonation, descending terrace intonation. See also **Intonation, Intonation contour.** Terrace intonation is not to be confused with terrace tone.

Tone. A phonemic prosody or feature of the word. An obligatory element which spans the basic word or each part of a complex word. It is a musical pitch or a glide from one pitch to another. Tone is not to be confused with intonation.

Tone sandhi. Predictable morphophonemic changes of the pitch of tonemes in limited positions. Three types of tone sandhi are described here: Tone sandhi I affecting the tone of the satellite in expanded words, Tone sandhi II affecting the tone of the second noun of a noun phrase in phonological groups, and Tone sandhi III affecting the tone of general type pronouns in grammatical verb phrases in phonological groups.

Toneme. A phoneme consisting of a tone or musical pitch or glide in a tone language.

Variant. In this work it usually refers to nonsignificant phonetic alternants which are regular and automatic variations of phonemes. Types: duration, vowel, and consonant variants.

Volume. Loudness or softness of the voice. Functioning as a characteristic of stress or of parts of discourse, paragraph, and sentence.

Vowel sandhi. Predictable assimilatory variants which are also morphologically conditioned. In compound words it is realized as both progressive and regressive assimilation.

Vowel distribution. A nonphonemic demarcative feature of the word. Limited vowel sequences, manifesting a type of vowel harmony.

Word, phonological. A word which is described phonologically. It may correspond to a grammatical word or to a word plus one or more sentence particles. A phonological word may have one or more stresses and is bounded by word juncture.

Word juncture. A possible pause followed by a rhythm unit bearing initial word stress and preceded by an unstressed or stressed rhythm unit.

Word rhythm. An initially stressed series of sounds bounded by open junctures and comprising one or two rhythm units with optional intervening semiopen juncture which constitute measured movement or flow of a word. See also **Rhythm**.

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