MOORE STRUCTURE: A GENERATIVE ANALYSIS OF THE TONAL SYSTEM AND ASPECTS OF THE SYNTAX

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Moore Structure: A Generative Analysis of the Tonal System and Aspects of the Syntax

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Linguistics

by

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1971
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1971
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This book is dedicated to the Mossi people, may they continue to use and develop their wonderful language.
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sought on a less extensive basis. Any mistakes in this work in the Mooré sentences or their interpretation should be attributed to faulty transcription or understanding on my part, and not to the informants.

While in Upper Volta, I benefited greatly from the advice and consultation of the following people whose insights and extensive formal knowledge of Mooré structure provided important stimulation to my thinking: Abbé Laurent Naré, Frère Jean Baptiste Bunkungu, and Père Camille Ranzini, all of whom are with the Catholic Mission of Upper Volta. The latter two run a course in Mooré at Gilungu for priests and nuns of foreign origin working in Upper Volta. They very kindly permitted me to attend their class during my stay at Gilungu, an experience which was of inestimable value to me.

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ABSTRACT OF THE DISSERTATION

Mooré Structure: A Generative Analysis of
the Tonal System and Aspects of the Syntax

by

Thomas Howe Peterson

Doctor of Philosophy in Linguistics

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Professor Paul Schachter, Chairman

Part I deals primarily with the tone system. It begins
with an explanation of the theoretical framework to be used;
following this is a short section outlining the segmental
phonemes and the conventions to be used in writing them.
The tone system is analyzed in detail from the word level to
that of the sentence. It is shown how three surface tones
can be analyzed as two systematic phonemic tones at all
levels. Formal rules which generate all the observed sur-
face tone patterns are presented.

Part II applies the notion of deep structure abstract
verbs to the analysis of certain aspects of Mooré syntax.
First a brief introduction to the theory of abstract verbs
in syntax is presented. Following this there is a detailed
classification of verbs which take sentential complements in
Mooré plus syntactic features and transformational rules
which will account for the various patterns observed in the
surface. The following classes are established: true verbs
of declaration, mental verbs of declaration, verbs of command, verbs of willing, verbs of perception, and auxiliaries. This analysis is used to explain the structure of declarative and imperative sentences by positing that they originate as sentential complements of abstract verbs of true declaration and command, respectively.

Next it is shown that there are two basic types of sentence conjunction with 'and': dependent and independent. Abstract verbs enable us to explain the difference between these types as conjunction within a complement (dependent) versus conjunction between higher abstract verbs (independent) whose complement sentences appear as the surface conjoints. In addition, certain systematic differences between conjunction and disjunction are examined and it is proposed that, in deep structure, sentence conjunction (with 'and') is a right branching recursive structure where sentence is introduced as a sister to verb phrase, while the deep structure for disjunction is seen as being conjoint sentences introduced under a different node. Then it is shown how certain sentential time adverbs (e.g. those headed by when, after, while, and before) and the case relations of dative, instrumental, locative, and benefactive are derived from underlying dependent conjunction. Finally, purpose and reason adverbials are analyzed as originating in deep structure as complements of the abstract verbs of willing and entailment, respectively.
Phrase structure rules, sample deep structures, and transformations are provided for all of the above constructions. At the end of Part I there is a list of all the phonological rules proposed and at the end of Part II a list of the phrase structure, syntactic features, and transformations proposed. An appendix with the text and translation of a Moore' folktale is provided as the final piece.
INTRODUCTION

The general theoretical model employed in this work is that of Generative-Transformational Grammar as developed by Noam Chomsky and his adherents over the past decade. The pros and cons of this and competing theories have been discussed at length in so many other articles and books that I feel it is unnecessary to justify my choice of this theory in these pages. As to the appropriateness of this theoretical approach for a description of this particular language, I shall let the reader judge for himself from the range of facts covered and the depth of explanation achieved in the analysis of Moore' that follows.

There are two main parts to the work. Each part is in turn divided in sections which are numbered consecutively throughout the book. Part I is primarily devoted to an analysis of the tonal system, a facet of Moore' structure which has not been previously analyzed in detail. Section one of Part I establishes certain theoretical points, rule conventions, and symbols which are employed in the tonal analysis. Section two presents a brief sketch of the segmental sound system (i.e. consonants and vowels) and the orthographic principles used in writing Moore; this is an informal description of the distinctive sounds and their

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alternations--no formal phonological rules are presented for the segmental phonemes. Section three gives a detailed analysis of the tone system from the level of word formation to the level of the major constituents of the sentence.

Part II deals with certain aspects of the syntax of Moore, namely verb complementation and certain other constructions which I shall claim are related to verb complementation. The analysis of the syntax is based on a school of thought within generative grammar which postulates the existence of 'abstract' verbs at the level of deep structure. Section four, the introduction to Part II, briefly explicates this theory. Section five establishes the structural parameters which define six distinct classes of verbs that take sentential complements and at the same time sets up a system of syntactic/semantic features based on these parameters. Then a simple set of phrase structure rules and a set of transformations for sentential verb complements is presented. In section six 'explicit' and abstract performative verbs are discussed and the derivation of declarative sentences, direct quotes, and imperatives are linked to the latter. Section seven discusses conjunction and disjunction and applies the notion of abstract performatives in their analysis. Section eight deals with certain constructions which are shown to be related to conjunction; namely sentential time adverbs and certain case relations, and proposes rules for their derivation from an underlying conjunction. Section
nine points out the close structural and semantic parallels
between reason adverbials and complements of verbs of entail-
ment and between purpose adverbials and complements of
verbs of willing, and proposes that these surface adverbial
types originate in deep structure as complements of abstract
verbs of the aforementioned types. Section ten gives a final
list of the phrase structure and transformational rules
proposed in the preceding sections. In section eleven I
have included the text and translation of a Mooré folk tale.
This illustrates the play and usage in an extended context
of many of the constructions discussed in the previous
sections.

This is not, of course, the only study of Mooré, though
the list of previous works is not large. The most extensive
of these is the monumental two volume grammar and dictionary
wrote the research proposal for investigation of Mooré, in
my transformationalist zeal I included some rather depreca-
tory remarks about Alexandre's syntactic description. How-
ever, as my work progressed I found myself turning frequently
to his book, and especially the most excellent dictionary,
for examples on which to base further inquiries. His study
is to be admired not only for the enormous range of facts
which he noted and the accuracy with which he recorded them,
but also for his many interesting insights. The main de-
ficiency of the work is that it takes no account of tone
and therefore the behavior of certain morphemes is not fully described and their role in the syntax is not properly understood. Also there are certain deficiencies, largely corrected by Houis (cf. below) and others, in Alexandre's transcription system for the segmental phonemes of Mooreé. But all in all, the present work owes a large debt to the careful observations of Alexandre.

Another scholar whose work I found to be stimulating is G. Manessy. In particular his article "Les particules affirmatives postverbales dans le groupe voltaïque" (1963) reveals important facts about the postverbal particle a-la. Although ultimately my analysis of this particle disagrees with Manessy's, I found that his ideas provided a useful base for further investigation. But, again, his analysis suffers because it takes no account of tone.

The article "Principes d'orthographe du Moré" by H. Houis has several good observations on the segmental system of Mooreé phonology. It corrects most of the errors made by Alexandre in this area. Many of Houis's points are incorporated in the UNESCO report (1968) upon which section two is based.

In addition to the above writings, there are two works on Mooreé of fair size which I found to be of little or no help in my researches. The Foreign Service Institute (U.S.) manual Mooreé, a Basic Course (Lehr et al., 1966) is pedagogically oriented and was apparently put together in some haste.
It consists mainly of drills, contains almost no analysis, and has many errors, though it does attempt to mark tone throughout. *Contes mossi actuels* by G. Canu is mostly texts of folk tales. There are several pages on the phonology, but nothing is added to what Alexandre and Houis have already discovered. Canu does, however, mention that Mooreé has tone. In all he devotes four pages to it and simply asserts that Mooreé has three distinctive tones: high, mid, low. As will be seen, my analysis disputes this in arguing that mid tone is derived from a downstep high.

With respect to theoretical models, an important precursor in the area of generative accounts of terraced level tone systems of the type found in West Africa is *A Phonology of Akan: Akuapem, Asante, and Fante* by Paul Schachter and Victoria Fromkin. I found this work along with personal comments by the authors to be of great help. Although many of the specific rules of Mooreé differ from those of Akan, the principles of downstep underlying the two systems are the same. (Of course the original discovery of the link between automatic and non-automatic downstep was made by J. Stewart (1964)—cf. Section 3.3.) Except for certain details my presentation of automatic downstep follows closely that of Schachter and Fromkin.

In the area of performatives and abstract verbs in syntax, I am indebted to the work of J. Ross (1968), R. Lakoff (1968), and J. Sadock (1969). For further reference
and explication of their writings, I refer the reader to Section 4.2 of Part II. None of these authors deals with African languages; to my knowledge the present study is the first to find extensive evidence of abstract verbs in a non-Indo-European language.

Finally, I would like to add a word of explanation about the seemingly disparate topics of the two main divisions of the work and then some brief comments to underline for the reader those aspects of the book which I feel to be of particular interest.

First, it may seem to some that this is really two dissertations, one on the tone system and one on the syntax of verb complementation and related constructions and that the two do not really belong together. I can only reply that were we dealing with a language like English where there is no dispute about what the morphemes are that mark such essential functions as tense, aspect, mood, complementation, nominalization, etc., then it would be possible to launch right into a discussion of the syntax with little or no discussion of the morphology. I would like to have been able to do this with Mooré, for the syntax is what holds the greatest interest for me. Yet after a cursory investigation it became evident that there were certain common morphemes which had important syntactic functions and for whose behavior there was no clear explanation. Moreover it could be seen that certain inexplicable tonal changes in the
complements of sentences of different syntactic types occurred. Thus in order to properly understand the syntax of Moore', it was first necessary to accurately identify and describe its morphology; this in turn entailed a full understanding of the tonal system. As the later subsections of section three indicate, this leads to an analysis of certain morphemes (e.g. the postverbal particles a ~ la and me, and the perfective) which differs considerably from previous analyses.

Once embarked upon this task I felt that, inasmuch as the tone system of Moore' had never been properly described, I should do as complete a job as possible, which accounts for the considerable length of Part I. Although one can readily understand the gist of Part II without reading Part I, there are several references to Part I in the discussion of the syntax. In particular, many of the criteria for distinguishing the different classes of verb complements in section five are based on points established in section three.

Part II should prove interesting to those concerned with general syntactic theory as well as Africanists because it provides one of the only extensive applications of the notion of abstract verbs to the description of a language, R. Lakoff's (1968) book on Latin syntax being the only other application of comparable extent. The principal reason for my choosing this approach is that it works so well. I had
been wrestling for several months in the field with a mass of facts which didn't seem to make very good sense. Then, upon returning to the States, I encountered Ross's paper on the declarative performative and R. Lakoff's book on Latin, and later Sadock's thesis on hypersentences. Suddenly everything fell into place. The fact that a theory about which I knew almost nothing while collecting my data could explain that data so well provided dramatic proof for me of the validity of the abstract verb analysis.

While section five (which identifies the Mooré equivalents of certain universal verb classes), section six (which establishes the abstract verbs of declaration and command and their relation to declarative and imperative sentences respectively), and section nine (which analyzes reason and purpose adverbials as complements of abstract verbs), are basically supportive of the claims of previous works, section seven extends the theory of abstract verbs into an area of syntax where it has not been applied before, namely conjunction and disjunction. It presents, I feel, a revolutionary view of these structures, one which may not be readily accepted by many; for the claim is made that conjunction and disjunction are semantically and structurally different sorts of constructions and that while the latter is a true conjoint structure, the former is a right branching recursive structure under S. When I first began my investigation of Mooré, I entertained this notion for a brief while,
but rejected it simply because it seemed so divergent from
the traditional view. Two years later I found myself back
at the same point, but with stronger reasons. Wherever
possible in section seven I have attempted to use examples
and arguments from English to provide some evidence across
languages.

Given the analysis of conjunction in section seven,
which distinguishes two types, 'dependent' and 'independent',
section eight shows how sentential time adverbs and certain
case relations can be derived from an underlying dependent
conjunction. This section also breaks new ground.

* * * * *

Mooré is the principal language of Upper Volta (West
Africa); it has about two and one-half million native
speakers and many thousands who speak it as a second lan-
guage. Greenburg (1963) classifies it as a member of the
Gur subfamily of the Niger-Congo family. Before the period
of European domination, the Mossi commanded a considerable
empire and were one of the most powerful peoples of West
1.0 Theoretical Considerations

1.1 Basic Assumptions

The theoretical base upon which this analysis of the Mooré tone system depends is the theory of Generative Phonology as put forth by Chomsky and Halle in *The Sound Pattern of English* (1968). I shall provide only a brief summary of some of the cardinal tenets which underlie this theory. For those who wish a full explication and justification, I refer them to chapters One, Seven, Eight, and Nine of the above work.

Generative Phonology posits that there is a set of binary phonological features which underlie the sound systems of all human languages. Each distinctive sound unit or 'systematic phoneme' of a given language is made up of a bundle of these features and for each phoneme each feature has either a plus (+) or a minus (−) value. Any feature which distinguishes one phoneme from another is a distinctive feature. Furthermore, it is assumed that sound systems of natural languages are characterized by different levels of abstraction, the most abstract being the systematic phonemic level, where the basic contrastive relations are expressed, and the most concrete, i.e. the closest to actual pronunciation, being the systematic phonetic, and that there is a set
of formal rules which operate in stages, i.e. in a given order, to convert an input of abstract systematic phonemic forms into phonetic output, principally by means of feature changes.

Since the focus of this analysis is on the tone system, for the most part I shall make explicit mention of only one phonological feature, that of tone; but it is assumed that a full set of phonological features underlies the vocalic and consonantal system described in the following section on orthography and that the orthographic symbols for unit phonemes are simply convenient abbreviations for bundles of features. Also, following the proposal of Stanley (1967), it is assumed that all matrices are fully specified in the Lexicon, and that there is a set of morpheme structure conditions (MSC) which express the phonological redundancies and permissible sound combinations for Mooré. Some of these are presented in §3.

With respect to phonological rules, this work deals only with those which bring about changes in tone and with a number of closely allied segment elision rules which affect the operation of the tone rules; again, it is assumed that there is a full set of rules which apply to the features which serve to define the various consonant and vowel phonemes of Mooré, although these rules are not explicitly stated. The allophonic and morphophonemic changes mentioned in the section on orthography can be taken as informal
statements of many of these rules. For example, the observation in §2.2 (1) about the automatic lengthening of root vowels when followed by a -CV suffix implies the following formal rule:

\[
[-\text{Consonantal}] \rightarrow [+\text{long}] / [+\text{BOUND}] \ C \ [-\text{AB}] \ +\text{AB}] \text{CV}
\]

Chomsky and Halle also posit the existence of certain rules which operate cyclically, i.e. their operation is iterated at successively higher levels of constituent structure beginning with the lowest level and moving up to the highest. I have found no need for such cyclic operation of rules in the Mooré tonal system, though, as will be shown in §3, there are certain rules whose operation is iterated from left to right.

The remainder of this section explicates the specific symbols and conventions used in the present work.

1.2 Phonological Features

As mentioned above, the main phonological feature referred to in the rules proposed in this thesis is that for tone. Since Mooré can be analyzed as having only two tones at the systematic phonemic level, there is need for only one feature for tone. I shall call this [High] (abbreviated as H), where [+H] represents high tone and [-H] represents low tone. (Schachter and Fromkin (1968) use [TONE] for high and low tone in Twi, because [High] is used for vowels; since there is no mention of feature specifications of vowels and consonants in this work, no confusion arises.)
For segmental units I shall use the following two abbreviatory symbols: V stands for the class of all vowels and C for the class of all non-vowels, i.e., true consonants, liquids, and glides.

Every bundle of features is enclosed in square brackets, which, when left open at the bottom, signify that the features mentioned are only a partial listing of the features in that bundle:

\[
\begin{bmatrix}
F_1 \\
F_2 \\
\vdots \\
F_n
\end{bmatrix}
\]

When a single feature within a given matrix is referred to, it is enclosed in full brackets, e.g.

\[ [+F_1] \rightarrow [-F_1]/[+F_2] X \]

1.3 Non-articulatory Features

Every matrix (i.e. bundle) of features is marked for the feature [SEGment]; at the systematic phonemic level all consonants and vowels are marked [+SEG], while all boundary elements are [-SEG]. As will be seen in §3, this feature plays an important role in the process of elision.

The following features are used to define boundary elements: [BOUNDary], [Word Boundary], and [Affix Boundary]. All boundary elements are [+BOUND] while all non-boundaries are [-BOUND]. There are three types of boundaries: word
boundary, root boundary, and affix boundary, which are respectively symbolized as #, +, and -. The feature specifications for these are given below:

Word Boundary (#); Root Boundary (+); Affix Boundary (-)

```
[+BOUND]  [+BOUND]  [+BOUND]
[+WB]    [-WB]    [-WB]
[-AB]    [+AB]    [+AB]
```

Often I will use the cover symbols given above in place of a matrix specification, but it is assumed that the cover symbols are only abbreviations like the orthographic symbols used for phonemes.

In addition, there is a set of lexical features such as [+NOUN], [+PRO], etc., and every matrix of a given morpheme is marked for these features, e.g. all the segments of a pronoun are [+PRO]. This type of feature is used to restrict certain elision rules to specific elements, e.g. cf. the rule for elision of the declarative marker §3.29 (129).

1.4 **Labelled Brackets**

Labelled brackets indicating constituent structure will be assumed in all surface structures issuing from the transformational component. However, they will be mentioned in rules only when they are actually needed to restrict an environment. For the most part I shall rely on boundary symbols to indicate divisions in an utterance. Whereas boundary elements are defined as a matrix of features, brackets are not represented by features. A list of the constituent labels can be found in §1.8.
1.5 Rule Conventions

Chomsky and Halle (ibid.) have developed abbreviatory conventions which permit certain types of similar rules to be combined and expressed as a single statement. I shall make use of some of these conventions, which are explicated below.

Rules which are combined by means of parentheses are disjunctively ordered, that is, only one of them may be applied and, if more than one is applicable, the more complex (i.e. the one with parenthesized elements present) must be chosen over the less complex (i.e. the one where parenthesized elements are absent). Thus the rule in (a) is an abbreviation for the three rules in (a1), (a2), and (a3):

\[
a) \quad \left[ +F \right] \rightarrow \left[ -F \right]/\_\_x(y(z))
\]

\[
a1) \quad \left[ +F \right] \rightarrow \left[ -F \right]/\_\_xyz
\]

\[
a2) \quad \left[ +F \right] \rightarrow \left[ -F \right]/\_\_xy
\]

\[
a3) \quad \left[ +F \right] \rightarrow \left[ -F \right]/\_\_x
\]

where (a1) must be chosen before (a2) or (a3) and (a2) must be chosen before (a3).

Rules which are abbreviated by means of curly brackets are conjunctively ordered, i.e. all which are applicable must be applied and they must be applied in the order stated from top to bottom in the brackets, e.g. the rule in (b) is an abbreviation for the rules in (b1), (b2), and (b3):

\[
b) \quad \left[ +F \right] \rightarrow \left[ -F \right]/\_\_\{x, y, z\}w
\]

\[
b1) \quad \left[ +F \right] \rightarrow \left[ -F \right]/\_\_xiv
\]

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b2) \([+F] \rightarrow [-F]/__yw\)

b3) \([+F] \rightarrow [-F]/__zw\)

where (b1), (b2), and (b3) must be applied in the order stated.

Variables in the form of Greek letters are used in place of a plus/minus marking to combine rules where two or more features have the same value, e.g. (c) below is an abbreviation for (c1) and (c2):

c) \([+F_1] \rightarrow [-F_1]/[\alpha F_2] \rightarrow [\alpha F_3]\)

c1) \([+F_1] \rightarrow [-F_1]/[-F_2] \rightarrow [-F_3]\)

c2) \([+F_1] \rightarrow [-F_1]/[+F_2] \rightarrow [+F_3]\)

In the case where two features have opposite values, a minus is placed before one of the variables, e.g. (d) below is an abbreviation for (d1) and (d2):

d) \([+F_1] \rightarrow [-F_1]/[\alpha F_2] \rightarrow [-\alpha F_3]\)

d1) \([+F_1] \rightarrow [-F_1]/[+F_2] \rightarrow [-F_3]\)

d2) \([+F_1] \rightarrow [-F_1]/[-F_2] \rightarrow [+F_3]\)

(That is, if \(\alpha = +, -\alpha = -\); and if \(\alpha = -, -\alpha = +\).)

Variables may also be used on parentheses to tie the presence or absence of the parenthesized element to the presence or absence of some other parenthesized element or to the value of some feature. When such a variable has a plus value, it signifies the presence of the element in parentheses and when it has a minus value, it signifies the absence of the parenthesized element. Parentheses with variables are written as angled brackets, though this is only a
customary notational difference. (e) below is an abbreviation of (e1) and (e2), while (f) abbreviates (f1) and (f2):

\[
\begin{align*}
\text{e1)} & \quad \left[ +F_1 \right] + \left[ -F_1 \right]/xy \quad \underline{z} \\
\text{e2)} & \quad \left[ +F_1 \right] + \left[ -F_1 \right]/y \quad \underline{\alpha} \\
\text{f)} & \quad \left[ +F_1 \right] + \left[ -F_1 \right]/\left[ aF_2 \right] \quad x \quad \underline{y} \\
\text{f1)} & \quad \left[ +F_1 \right] + \left[ -F_1 \right]/\left[ -F_2 \right] \quad x \quad y \\
\text{f2)} & \quad \left[ +F_1 \right] + \left[ -F_2 \right]/\left[ +F_2 \right] \quad x \\
\end{align*}
\]

Rules abbreviated by variables are always disjunctively ordered.

The device of placing a subscript and/or a superscript number on a segment is used to signify a bounded sequence of that segment, a subscript expressing the minimum number permitted and a superscript the maximum number. For example, \(C_1\) is read as "a sequence of one or more consonants"; \(C_2\) is read as "a sequence of not less than one and not more than two consonants"; \(C_0\) is read as "a sequence of zero or more consonants".

Finally, in rules which use more than one set of curly brackets, when the elements in one are in exact correspondence with those in another, the two sets of curly brackets are marked with the same small letter subscript, e.g. (g) is an abbreviation for (g1) and (g2):

\[
\text{g)} \quad \left[ +F_1 \right] + \left[ -F_1 \right]/\left\{ \begin{array}{c} p_i \\ q_i \end{array} \right\} \quad \underline{x}_{i} \quad \underline{z}_{i}
\]
g1) \([+_P^1] \rightarrow [-P^1]/p\quad xy\)
g2) \([+_P^1] \rightarrow [-P^1]/q\quad xz\)

1.6 **Boundary Reduction Conventions**

In the Lexicon, morphemes are bounded in the following ways: roots and particles are bounded on the left and on the right by root boundary, e.g. \(/[+_då+]//\) 'to buy', while all suffixes are bounded on the left by affix boundary, e.g. \(/[_-bå]/\) 'plural of the human noun class', and prefixes (of which there is only one remaining from an earlier historical stage where there were many) are bounded on the right by affix boundary, e.g. \(/_å-/\), a prefix which appears on all human personal names. Word boundary bounds complex words on the right and the left, e.g. \(/[#+[påg]+[_-å]#]/\) 'woman', and it is inserted as a boundary on the right and left of major constituents such as NP, VP, Vb, and S. Many of the larger grammatical phrases enclosed by it behave phonologically like words. All elements bounded by boundary elements are enclosed by brackets in the surface structure.

In order to facilitate a less complex statement of the phonological rules, I shall assume that the following boundary reduction conventions operate after the MSC and before the phonological rules:

\[
\left\{ \begin{array}{c} 
\{ \text{[BOUND]} \} \\
G \\
H \\
\end{array} \right\} \quad Y
\]

\[
\left\{ \begin{array}{c} 
\{ \text{[BOUND]} \} \\
J \\
\end{array} \right\} \quad X
\]

\[
\left\{ \begin{array}{c} 
\{ \text{[BOUND]} \} \\
K \\
\end{array} \right\} 
\]

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b) \( X[\text{[aW}B]\text{]}_L^{-\text{AB}} M^{-\text{AB}} Y \rightarrow X \emptyset ] \text{[aW}B]\text{]}_L^{-\text{AB}} M^{-\text{AB}} Y \)

c) \( X[\text{aAB}]]_Q^{-\text{aAB}} Y \rightarrow X \emptyset ]_Q^{-\text{aAB}} Y \)

(a) operates iteratively from within a constituent first from right to left and then from left to right, beginning in each case at the lowest level of constituent structure, and removes all but the outermost of a sequence of boundaries separated by brackets, e.g.

\[
[\# [\# [+\text{da}+] \#] \#] \rightarrow [\# [\emptyset [\emptyset \text{da} \emptyset] \emptyset] \#]
\]

(b) operates after all applications of (a) and reduces a sequence of two word boundaries or two root boundaries which are separated by two brackets (of opposite direction) to a single such boundary at the juncture of the two brackets, e.g.

\[
[\# [\# \rightarrow \emptyset ] \# [\emptyset \text{NP} \text{VP}] \rightarrow [\emptyset \text{NP} \text{VP}]
\]

(c) operates on a combination of a root boundary followed by an affix boundary or a combination of affix boundary followed by a root boundary and deletes the left member of the pair and places the right member at the juncture of the brackets which separate them, e.g.

\[
X[\text{[a-][+kul][-ga]]}_N^{\text{NOM}} Y \rightarrow X[\text{a} \emptyset+[\emptyset \text{ku} \emptyset]-[\emptyset \text{ga}]]_N^{\text{NOM}} Y
\]

(There is empirical evidence for this last reduction in that prefixes behave like roots rather than affixes with respect to tonal assimilation, i.e. assimilation does not extend over
to the next syllable as it does with suffixes (cf. the comments following (101) in section 3.22).

1.7 Dialects

For the most part I have not found a great deal of divergence between dialects of Mooré with respect to tone and therefore the majority of the examples in the text are not marked as to dialect. However, in certain cases, to be noted in §3, dialectal differences are important, and in these cases the examples in the text are marked with the following abbreviations: Y for Yako, G for Gilungu, and Yt for Yatenga. Where an example is unmarked, it is to be assumed that it is from the Yako dialect, though in most cases it may hold for the other dialects as well.

1.8 Symbols

The following is a list of symbols in use in the text:

a) Features

\(\text{\textasciitilde\text{H}}\) (High)

\(\text{\textasciitilde\text{INFLECT}}\) (Inflectional)

\(\text{\textasciitilde\text{CM}}\) (Complement Marker)

\(\text{\textasciitilde\text{PRO}}\) (Pronoun)

\(\text{\textasciitilde\text{DM}}\) (Declarative Marker)

\(\text{\textasciitilde\text{PERFECTIVE}}\) (Perfective Aspect)

\(\text{\textasciitilde\text{BOUND}}\) (Boundary)

\(\text{\textasciitilde\text{WB}}\) (Word Boundary)

\(\text{\textasciitilde\text{AB}}\) (Affix Boundary)
\( \text{SEG (Segment)} \)
\( \text{NASAL (Nasality)} \)

b) Cover Symbols

\( \text{NS (Noun Stem)} \)
\( \text{VS (Verb Stem)} \)
\( \text{AS (Adjective Stem)} \)
\( \text{Suf (Suffix)} \)
\( \text{R (Root)} \)
\( \text{C (all non-vowels)} \)
\( \text{V (Vowel)} \)
\( \text{H (High Tone)} \)
\( \text{L (Low Tone)} \)
\( \# \) (Word Boundary)
\( + \) (Root Boundary)
\( - \) (Affix Boundary = Prefix Boundary or Suffix Boundary)

c) Phrase Markers

\( \text{N (Noun)} \)
\( \text{Adj (Adjective)} \)
\( \text{V (Verb)} \)
\( \text{P (Perfective)} \)
\( \text{I (Imperfective)} \)
\( \text{D (Determiner)} \)
\( \text{NUM (Number)} \)
\( \text{NOM (Nominal)} \)
\( \text{NP (Noun Phrase)} \)

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Vb (Verbal Group)
ASP (Aspect)
VP (Verb Phrase)
S (Sentence)
2.0 The Segmental System

2.1 Orthography

Throughout this work the segmental system of Mooré will be written in accord with the principles laid down in the report on Mooré orthography issued by the UNESCO Project on Adult Literacy in Upper Volta (UNESCO, 1968). Since I accept the fundamental oppositions recognized in the above mentioned report, and inasmuch as the present work does not attempt a formal analysis of the vowels and consonants of Mooré, I shall list the symbols to be used without citing examples to illustrate all the oppositions.

The orthographic system outlined below represents a middle ground between the "systematic phonemic" level, the highest level of phonological abstraction where no phonological rules have applied, and the "systematic phonetic" level, the point at which all phonological rules have applied. I shall adopt the convention of writing systematic phonemic representations between slashes, i.e. / /, and systematic phonetic representations between brackets, i.e. [ ]. Utterances represented in orthographic form will not be enclosed by any symbols. The majority of the citations in this work are in the latter form, often supplemented by the former two.
2.2 Vowels

The pronunciation of most of the vowels is evident from the orthographic representation. I have included an approximate phonetic representation for those that are not. The orthographic vowels are the same as the systematic phonemic vowels of Mooré.

<table>
<thead>
<tr>
<th>Oral</th>
<th>Nasal</th>
</tr>
</thead>
<tbody>
<tr>
<td>i u</td>
<td>ɨ ˠ</td>
</tr>
<tr>
<td>i [i] u [u]</td>
<td>ʰ ˠ ʰ</td>
</tr>
<tr>
<td>e [e] o [o]</td>
<td>ɛ ɜ</td>
</tr>
<tr>
<td>a</td>
<td>ā</td>
</tr>
</tbody>
</table>

Diphthongs and Triphthongs

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>iu</td>
<td>ui [wi]</td>
</tr>
<tr>
<td>ʰu [u]</td>
<td>ʰi [wi] , ʰe [we]</td>
</tr>
<tr>
<td>eo</td>
<td>oe [we] , ʰe [we]</td>
</tr>
<tr>
<td>ea ɛ</td>
<td>oa [wa]</td>
</tr>
<tr>
<td>ao [ɔ]</td>
<td></td>
</tr>
<tr>
<td>ae [ɛ]</td>
<td></td>
</tr>
</tbody>
</table>

Allocophonics and Morphophonemics

1) Vowel length is not a distinctive feature at the systematic phonemic level; at the phonetic level the vowel of a CV root is lengthened whenever a CV suffix is added. This is represented in the orthography by a geminate cluster, e.g.

/dɔ - gɔ/ ṭoɔɡɔ  'house'
/bɔ - ɡɔ/ ɓaagə 'dog'
Such lengthening does not occur when a -V suffix is added, e.g.

/žò-á/  žòá  'friend'

2) In any geminate cluster or diphthong only the first vowel is marked for a diacritic in the orthographic representation. Phonetically, the quality represented by the diacritic carries through the whole sequence wherever applicable, e.g.

sígá  [sǐyá]  'soul'

lúf  [lwr]  'to fall'

kōongó  [kōʊg̊o]  'guinea fowl'

but ye is not [wɛ], since there is no "œ" in the system.

3) The diphthongs ea and ao in many dialects are commonly pronounced [ɛ] and ao is pronounced [ɔ], e.g.

bèa  [bɛ]  'to stick (vt.)'

básɛlɛ  [bɛlɛ]  'harp'

băo  [bɔ]  'to search'

b)  u, ʊ, and ɔ followed by another vowel are pronounced as [w], e.g. bōc  [bʊc]  'what?'.

5) There is vowel harmony between root and suffix vowel.  i  and  u  form the upper harmonic set and  i, ʊ, ɛ, ɔ, ə  form the lower set. The root and suffix vowel combinations are as follows:

<table>
<thead>
<tr>
<th>Root</th>
<th>Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>i</td>
</tr>
<tr>
<td></td>
<td>u</td>
</tr>
<tr>
<td></td>
<td>a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Root</th>
<th>Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>e</td>
</tr>
<tr>
<td></td>
<td>u</td>
</tr>
<tr>
<td></td>
<td>ɔ</td>
</tr>
<tr>
<td></td>
<td>a</td>
</tr>
</tbody>
</table>
Note that \(i\) and \(u\) occur only as root vowels and never as suffix vowels.

6) After a nasal consonant, there is no contrast between oral and nasal vowels, all vowels being automatically nasalized in this position. Nasalization is not marked in the orthography after nasal consonants e.g. moöré [mōdré] 'Mooré language'. An exception to this convention is when a morpheme with a nasal vowel, such as the locative ending Ó, is attached to a word that ends in a nasal consonant, e.g. kòóm 'water'. In this case we mark the nasalization on the vowel, since it is an identifying feature of the morpheme: koömé [koömé] 'in the water'.

7) When the plural nominal suffix -a (of the -re/-a class) is added to a CV root, the vowel of the root is not lengthened, a ñ is inserted between the root and suffix, and the suffix vowel is nasalized, e.g.

\[ /pǐ-ǎ/ \quad pǐyā 'mats'; /pǐ-ri/ \quad pǐiri 'mat' \]

Epenthetic Vowels:

8) The vowels of the nominal suffixes -go~gu, -ga, -ba, and -a appear in the root to which they are affixed when the root vowel is of a different articulation. It is inserted after the root vowel bringing about a diphthong, e.g.

\[ /bōn-gā/ \quad bōangā [bwaŋgā] 'donkey' \]
\[ /nō-gā/ \quad nōaagā [nwaayā] 'chicken' \]
\[ /kēe-gā/ \quad kēeaaga [kwēeyā~kwēaagā] 'court' \]

Note that in the last two examples, where the roots are CV
and CVV the automatic lengthening mentioned in (1) above shows up on the inserted suffix vowel.

9) At the phonetic level an epenthetic vowel appears between certain types of consonants of different articulation (where 'consonant' does not include glides). The pronunciation of this vowel is generally [ə], though it may take on the quality of either the root or suffix vowel when it occurs between a root and suffix and the suffix vowel is elided, e.g.

/å-kul-gå/ åkulgå [åkulgyå] 'a man's name'
åkulg doogå [åkulg dòoyå] ~
[åkulg dooyå] 'kulga's house'

This vowel is not represented in the orthography.

10) Words ending in a consonant when in utterance final position carry a final supporting vowel e-i. (The quality varies according to the harmonic principles established in §2.2(5).) For the most part this only concerns verbs, since nouns and adjectives always carry a suffix in this position and therefore end in a vowel. This supporting vowel is not added to nouns ending in the suffix -å, e.g. kōom 'water', though borrowed words ending in a consonant are automatically supplied with it, e.g. Pole for 'Paul'.

11) The non-final short-form pronouns f 'you (sg.)', d 'we', b 'they' are pronounced with an initial supporting vowel which is not indicated in the orthography. This generally has the pronunciation [ə] or [ɛ]: b wátå mé [èb wátå mé] 'They are coming'.

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12) For verbs whose stem ends in \( n \) or the suffix -\( ne \) an epenthetic vowel, which is represented in the orthography as \( o \), appears when a -CV suffix is added. This prevents assimilation of the \( n \), e.g. \( bônebo [bônebô] \) 'misfortune' from \( bône \) 'to be a misfortune'; \( dônegô [dônegô] \) 'the action of stretching' from \( dône \) 'to stretch'. But in verbs which terminate in \( m \) or the suffix -\( me \), no such vowel is inserted and assimilation of the nasal occurs, e.g. \( sâoongô [sâoongô] \) 'the action of kneading dough' from \( såamè \) 'to knead dough'.

2.3 Consonants

\[
\begin{array}{cccc}
\text{stops} & p, b & t, d & k, g \\
\text{fricatives} & f, v & s, z & h \\
\text{nasals} & m & n \\
\text{liquids} & l, r \\
\text{glides} & w & y
\end{array}
\]

At the systematic phonemic level all of the above consonants occur in root initial position (cf. \( 4 \), below for an exception), but in root final position only \( b, d, g; l, r; m, n \) and \( s \) occur.

Allophonics and Morphophonemics

\underline{stops}

1) Geminate voiced stops result in non-geminate voiceless stops of the same articulation:

\[
/b-\text{-}b/ \rightarrow [p]; /d-\text{-}d/ \rightarrow [t]; /g-\text{-}g/ \rightarrow [k]
\]

Such gemination always takes place over boundary, i.e. R-suf.

In the orthographic representation the voiceless stop is
written instead of the systematic phonemic geminate voiced stop: /bɔ̀g-ɡɔ/ bɔ̀kɔ́ 'hole'.

2) g has a spirantized allophone [ɣ] after ɨ, e, a, o, u:

bíiga [bíiɡá] 'child; fruit'
síigá [síiŋá] 'soul'
peåalgá [peål̥ŋá] 'white'

g is always 'hard' when preceded by a nasal consonant, regardless of the preceding vowel: bánga [báŋɡá] 'iron'.

3) Voiced stops are devoiced before voiceless consonants, e.g. kúgsé [kúksé] 'a type of tree'. Such stops will be spelled as voiced.

4) ɗ is in free variation with ṟ, which is phonetically a flap, in initial position. I shall always represent it as ɗ in the orthography, though in standard orthography, both ɗ and ṟ are used: dáwa [dáwa ~ ráwá] 'man'.

5) k and g are palatalized when followed by e. The palatalization is not indicated in the orthography: kĕ́ma [kĕ́má] 'older brother'

6) h occurs initially in what appear to be borrowed words (mainly from Arabic, c.f. Canu, 1968).

7) Geminate s will be written as such, e.g. /ɡis-si/ gli̯i̯si̯ 'threads'.
Nasals:

8) m and n in noun roots become homorganic before velar consonants; n becomes homorganic before bilabials; but m does not become homorganic before alveolars, e.g.

/gùm-/ gùngá, gùmsé [gùngá, gùmsé] 'a type of tree'
/dìm-/ dìngù, dìmù [dìngù, dìmù] 'realm(s)'
/tán-/ táongó, tándó [táongó, tándó] 'creepers'  
/sá-n/'- sáaná, sáambà [sáaná, sáambà] 'stranger(s)'

Nasals before velars will be spelled as n and before bilabials as m; before alveolars underlying m and n will be spelled as such.

Liquids:

9) l becomes n when followed by ã: /bé-lè/ béélè 'to greet someone'; /bé-lè-dà/ béénda [béénda] 'imperfective of 'to greet'. But geminate l is not pronounced n in that environment, e.g. /kél-lè-dà/ kěllá [kělláda] 'imperfective of the verb kěllè 'to be left over'.

10) r as the initial consonant of the nominal suffix -re undergoes the following changes: when preceded by l it becomes l and forms a geminate cluster, e.g. /gél-rè/ = géllè [géllè] 'egg', gélà 'eggs'; when preceded by a nasal consonant it becomes ã, e.g. /sól-mè-rè/ sólmà [sólma] 'fable', sóalmà 'fables'.

11) y, when followed by a nasal vowel, is itself nasalized and takes on a pronunciation close to [ŋ]. This is not indicated in the orthography: yámbà [ỳàmbà] 'you' pl.
2.4 Orthography for Tones

Standard Mooré orthography does not mark tone. Since Mooré has a tone system which is similar to that in many other West African languages, i.e. a terraced level system, I shall adopt the orthographic principles which were first put forward by Reverend J. G. Christaller (Christaller, 1875) for Twi, a Kwa language of Southern Ghana. This system has been used for other languages with this type of tone system as well.

As will be shown in Section 3 (cf. §3.1), there are just two distinctive tones at the systematic phonemic level: high and low. At the systematic phonetic level there are two contrastive units, high and low, in initial position and before a low tone; but after high there are three contrastive units, high on the same level as the preceding high, a high which is slightly lower than the preceding high (i.e. about midway between high and low) which is called "non-automatic downstep", and low tone. The same three possible contrasts exist after a non-automatic downstep, and therefore it is possible to get several descending levels of non-automatic downstep in a single utterance.

In the phonetic transcription, high is marked with acute accent (')​, low with grave accent (') and non-automatic downstep with a vertical mark ('). The phonetic transcription of tone as marked over words assumes the following principles: 1) all syllables (and in certain select
instances all voiced segments) are marked for tone; 2) sequences of marked tones are to be interpreted as follows

[...''''...] = ...HHH..., [...'''...] = ...LLL..., [...'''...]

= ...HH₁H₁H₁..., [...''''...] = ...HH₁H₂H₃... (where

H = high, L = low, and H₁, 2, 3... = descending levels of
non-automatic downstep.)

The virtue of Christaller's system of transcription is
that it enables us to express the three surface contrasts
after high and the terracing effect of successive non-auto-
matic downsteps with the use of only two tone symbols, high
and low, as indicated above. This is accomplished through
the following principles:

1) Any unmarked syllable carries the same tone as the
nearest preceding marked syllable which precedes it, e.g.:

*dáwa* [dáwá] 'man'

dà-songó [dà-sòngó] 'a good man'

à ká dug nemd ye [à ká důg němd yé] 'He didn't
cook the meat.'

2) Any syllable which is marked for high which is in
turn preceded by a marked high has the phonetic value of a
mid tone in relation to the marked high tone that precedes
it, e.g.:

*bëngre* [bëngre'] 'bean'

Where there is a succession of marked highs, each bears the
relation of mid to it's predecessor, e.g.

(Y) à wábá mé [à wábá mé] 'He has eaten.'
Since there is no three-way contrast after low, there will never appear a succession of two or more marked lows. A low may be followed only by one or more unmarked syllables or by a high or by one or more unmarked syllables plus a high.

3) In Christaller's system a low tone which is in utterance initial position is not marked. I shall depart from his system and mark low tones in this position.
2.5 Footnotes

1. Whereas standard orthography (as put forth in the UNESCO report) marks lax \(\acute{\text{i}}\) and \(\text{u}\) with a grave accent, I shall use cedilla under the vowel to mark laxness, since in this work grave accent is used to mark low tone. Standard orthography does not mark tone. Also, I shall use tilde to mark nasalization; standard orthography employs circumflex.

2. Although it is recognized that lax \(\text{e}\) (i.e. \(\text{[e]}\)) always originates from a diphthong, the standard orthography often spells it as \(\text{è}\) (or \(\text{ê}\) in my system) in order to avoid piling up three or four vowels in a row as in \(\text{kweaga}[\text{kwe\text{è}ga}]\) 'court' (standard orthography: \(\text{kueega}\)). I shall spell out all vowel combinations and will not employ \(\text{ê}\) for \(\text{ea}, \text{ae}\).

3. There are a few words which appear to contradict this rule of lengthening such as \(\text{sòrè} \) 'road' and \(\text{lárè} \) 'hatchet', where the suffix is \(-\text{re}\). However, in some dialects an underlying root final \(\text{r}\) shows up in certain forms, e.g. \(\text{lá songó} \sim \text{lár songó} \) 'a good hatchet'. (In noun + adjective constructions, only the adjective carries a suffix, cf. Section 3.18.)

A similar phenomenon occurs with certain verbs which have irregular surface imperfective forms. Normally, when the imperfective suffix \(-\text{da}\) is added to a CV or CVV root, the vowel of the verb is lengthened, e.g. \(\text{dà} \) 'to buy', \(\text{dà-da} \rightarrow \text{dàdà} \) 'buying', but in the case of a small class of surface CV verbs, the vowel remains short and the \(\text{d}\) of the imperfective becomes \(\text{t}\), e.g. \(\text{wà} \) 'to come', \(\text{wa-da} \sim \text{watá} \) (*\(\text{wàdá} \) 'coming'. This is probably the reflex of an original underlying final \(\text{d}\) of the root, since by the principles noted in Section 2.3(1) geminate \(\text{d}\) becomes \(\text{t}\), e.g. \(\text{gàd(e)} \) 'to hold' \(\text{gàd-da} \rightarrow \text{gàtá} \) 'holding'. Other verbs which show the above irregularity are: \(\text{bì} \) 'to ripen'; \(\text{mè} \) 'to build'; \(\text{kò} \) 'to give'; \(\text{zòe} \) 'to run'; \(\text{vè} \) 'to become'; \(\text{zì} \) 'to carry'; \(\text{pùì} \) 'to share'; \(\text{sà} \) 'to finish'; \(\text{dí} \) 'to eat'; \(\text{tà} \) 'to arrive'; \(\text{lùì} \) 'to fall'.

4. This rule is actually a bit more restricted in that the suffix vowel \(\text{a}\) appears only in roots with \(\text{e}\) or \(\text{o}\) as a root vowel. Thus for \(\text{bi-ga/} \) 'child' the form is \(\text{bìgà} \) [bìgà] and not *\(\text{bi-éega}\). The suffix vowel \(\text{o-ù}, \) on the other hand, is not restricted and freely combines with \(\text{i}, \text{i}, \text{e}, \) and \(\text{a}, \) e.g. \(\text{vi-gù/} \) \(\text{viùgù} \) 'antelope'; \(\text{pe-gò/} \) \(\text{peòogò} \) 'basket'; \(\text{ya-gò/} \) \(\text{yaòogò} \) 'tomb'. When it combines with \(\text{i}\) it takes on the quality of \(\text{u}, \) e.g. \(\text{iù-gò/} \) \(\text{liùgò} \) [liùvùgò] 'bucket'.

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5. More precisely, such epenthesis occurs between any two consonants of different articulation where the second is not a fricative, though it may be even more restricted than this. I do not have sufficient data to make a definitive statement about vowel epenthesis.
3.0 The Tone System of Mooré

3.1 Surface Characteristics of Terraced Level Tone Systems

Mooré, like many other West African languages, has a 'terraced level' tone system. Tone systems of this type have presented significant difficulties for linguists employing traditional phonemic theory. In the following analysis we shall see how the concept of ordered rules (Generative Phonology) enables us to analyze three surface tones as two systematic phonemic tones. Previous traditional phonemic analyses have assigned three contrastive tonal units to this type of system, though it has been recognized that this does not adequately explain the facts. Thus H. A. Gleason remarked in a 1961 review concerning two phonemic analyses of terraced level tone systems:

"We should expect that general phonologic theory should be as adequate for tone as for consonants and vowels, but it has not been. This can only be for one of two reasons: either the two are quite different and will require totally different theory...or our existing theories are insufficiently general. If, as I suspect, the problem is largely of the second sort, then development of a theory better able to handle tone will result automatically in a better theory for all phonological subsystems."

First, let us examine the defining features of a terraced level system. (I shall use only examples from Mooré.) It is a subclass of the "level-pitch-register" type
established by K. Pike (Pike, 1948). That is, the tonemic units are level pitches and not glides such as are found in the Sino-Tibetan languages. (There are glides in many terraced level languages, but they can most often be shown to be the result of diachronic or synchronic coalescing of two or more level pitches. Such is the case in Mooré, cf. Section 3.17.) Terraced level systems can be described as having two basic tones, high (H) and low (L), plus two surface features: automatic downstep ('down-drift') and non-automatic downstep.⁴

Automatic downstep is: a) a slight lowering of a high tone when preceded by a low tone, the first high of a phrase being the highest possible high of that phrase; b) a slight lowering of any low tone that is preceded by a high, the first low of a phrase being the "highest" possible low in that phrase. A high immediately preceded by another high will have the same pitch as its predecessor, and the same holds true for a low immediately preceded by a low. A terraced effect results when several highs and lows are interspersed as in (1):

1) tónd dà yùdà dáam à bá doogē.

<table>
<thead>
<tr>
<th></th>
<th>-0</th>
<th></th>
<th>-1</th>
<th></th>
<th>-2</th>
<th></th>
<th>-3</th>
<th></th>
<th>-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>L₁</td>
<td>H₁</td>
<td>L₂</td>
<td>H₂</td>
<td>L₃</td>
<td>H₃</td>
<td>L₄</td>
<td>H₄</td>
<td></td>
</tr>
</tbody>
</table>

'We were drinking millet beer in his father's house.'
The subscripts on L and H below the phonetic transcription indicate the different terraced levels of high and low in the above sentence. Any sequence of L (or H) that is uninterrupted by an L (or H) will be of the same pitch level.

2) a) 'à ká' ko ye. 'He didn't cultivate.'

L H₁ H₁ H₁

b) tónd dá wata mé (G). 'We were coming.'

H L₁ L₁ L₁ H₁

There are two other phonetic facts about automatic downstep which should be noted: a) an initial high tone is slightly higher in pitch than a non-initial first high (cf. 3a); b) an initial low is slightly higher in pitch than a non-initial first low (cf. 3b). ⁵

3) a) ̀à kóodá mé 'He is cultivating.'

0 - - -0
-1 - - -1
-2 - - -2
-3 - - -3
-4 - - -4
-5 - L₁ L₁ H₂

b) tónd kùkùr'ì 'Our hoe handle.'

0 - - 0
-1 - - -1
-2 - - -2
-3 - - -3
-4 - - -4
-5 - H L₁ H₁ L₂
Thus the initial H in (3b) is higher than \( H_1 \) in (3a) and the initial L in (3a) is higher than \( L_1 \) in (3b).

Non-automatic downstep is a terraced high which occurs immediately after another high, but which is not predictable from the surface. Thus after a high, there are three possible contrasts: high (i.e. same as preceding high), non-automatic downstep (phonetically like a mid tone), and low; after a low or in initial position there are only two possible tones: high and low. Also, after a non-automatic downstep the same three possible contrasts exist as after a high. Within a phrase no high may ever be at a level higher than any preceding high.\(^6\) (4) below illustrates several non-automatic downsteps in the same sentence.

4) yâmb náaf wâbdá mám ki wâ.

\[
\begin{array}{cccccccc}
  & H & H_1 & H_2 & H_3 & H_4 & H_5 & H_6 \\
\end{array}
\]

'Your cow is eating my millet.'

In (5) below all the possible contrasts after high and low are illustrated:

5) a) sáaga [sáayá] \( H \ H \ H \) 'rain'

\[
\begin{array}{cccccccc}
  & H & L_1 & H_1 & H_2 & H_3 & H_4 & H_5 & H_6 \\
\end{array}
\]

b) sáagà [sáayà] \( H \ L \ H_1 \) 'broom'

c) sáag á [sáayá] \( H \ H_1 \) 'Go through it!'

\[
\begin{array}{cccccccc}
  & H & H_1 & L_1 & H_2 & H_3 & H_4 & H_5 & H_6 \\
\end{array}
\]

d) sàag á [sàayá] \( L \ H_1 \) 'Trust him!'

e) sà songó [sàsòŋgo] \( L \ L \ H_1 \) 'a good rain'

---

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3.2 The Automatic Downstep Rule

Before launching into tonal behavior at the various
techniques of the sentence, I shall first give the rule for
automatic downstep, even though it is a relatively late rule.
The process of automatic downstep is brought about by a
series of three rules. The first (in (6a) below) assigns a
relative pitch value in the form of an integer to initial
high tone or to initial low tone. (Actually this is two
rules.) In the lexicon only the abstract notions of high
and low are represented and both have a pitch value \( \varphi \) (where
\( \varphi = \text{null} \)). Thus the rule represented in (6) assigns the
integer 0 to an initial high (whether it is utterance initial
or initial in a major constituent after a breath pause, c.f.
note (6)) and any number of highs which follow it in a se-
quence unbroken by a low; and it assigns the integer -2 to
an initial low and any number of lows which follow it in a
sequence unbroken by a high. 7

6) a) Assignment of pitch level to phrase initial

\[
\begin{align*}
\{[+H \varphi]\} & \Rightarrow \{[+H_0]\} \\
\{[-H \varphi]\} & \text{i} \Rightarrow \{[-H_{-2}]\} \text{i} \quad / \quad X \quad \# \quad \left[ \begin{array}{c}
[+ \text{BOUND}]_0 \\
\end{array} \right]_1
\end{align*}
\]

The matrix marked with a subscript 1 in the environment of
(6a) indicates that the assignment of pitch level applies to
a sequence of one or more tones. Yet this sequence may
extend over more than a single morpheme or word and therefore
it may be interrupted by various boundary elements. In order
to capture this, I shall use the convention of writing a boundary matrix within another matrix. The matrices in the environment of (6a) are to be interpreted as follows: "a sequence of all high or all low tones interrupted by zero or more boundary elements." This convention proves useful for the statement of other rules involving sequences of tones as well (cf. RAISING (28) and ASSIMILATION (36)).

The other two rules assign a value to non-initial high and low relative to a preceding low and high respectively. These rules operate in the following manner: they begin with the first non-initial high or low that follows a tone of the opposite value and reapply from left to right until all non-initial highs and lows within an appropriate phrase have been assigned a relative pitch value. 8

6) b) Assignment of pitch level to non-initial high and low:

\[
\begin{align*}
[-H_y] & \rightarrow \begin{cases} 
[-H_{x-3}] & \text{if } i \\
[+H_{y+1}] & \text{if } i
\end{cases} / \begin{cases} [+H_x] & \text{if } i \\
[-H_y] & \text{if } i \end{cases}
\end{align*}
\]

This would work as follows: (where \( H = [+H] \) and \( L = [-H] \))

\[
\text{[41]}
\]
The Principal Behind Non-Automatic Downstep

In this section I would like to outline the major task of this analysis and sketch out the general line of attack. The basic aim will be to show that non-automatic downstep is
a surface feature and that in Moore there are only two tones, high and low, at the systematic phonemic level. It will be shown that non-automatic downstep and automatic downstep are the result of the same basic process outlined above in (6) and that the former results from the loss of a systematic phonemic low tone between two high tones.\textsuperscript{9}

There exist three possible sources for the loss of low tone: a) progressive assimilation (i.e. $HL \rightarrow HH$); b) regressive assimilation (i.e. $LH \rightarrow HH$); c) deletion (i.e. $HL \rightarrow H\emptyset$). In Moore, for the most part, loss of low tone which results in non-automatic downstep is the result of progressive assimilation, though in one instance, in possessive constructions (cf. Section 3.20), deletion of a low tone brings about non-automatic downstep.

In applying the generative model to the analysis of tone in Moore, I shall propose the following basic rules to account for non-automatic downstep. First there is a central and very general rule (actually it is two conjointly ordered rules) which inserts a $[-\text{SEG}]$ low tone at the end of a sequence of lows which is preceded and followed by a high tone and then assimilates all but the last of the resulting sequence of lows to the preceding high; next the automatic DOWNSTEP rule in (6) assigns relative pitch values to systematic phonemic high and low; and finally a late rule deletes all $[-\text{SEG}]$ matrices.\textsuperscript{10} Below in (8) is an informal sketch of the above process where parentheses around a tone indicates that it is $[-\text{SEG}]$. 

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8) a) ASSIMILATION
   1) X H L H Y \rightarrow X H L (L) H Y
   2) X H L(L)H Y \rightarrow X H H (L) H Y

b) DOWNSTEP
   X H H (L) H Y \rightarrow X H H (L_1) H_1 Y

c) [-SEG] DELETION
   X H H (L_1) H_1 Y \rightarrow X H H H_1 Y

Thus a systematic phonemic H L H sequence becomes systematic phonetic H H H_1.

3.4 Segment Structure of Roots and Affixes

Before beginning the analysis of tone at the word level, let us first state the segment structure of the morphemes which make up words. Inflectable words, i.e. verbs, nouns, and adjectives, are composed of roots and suffixes. Since all adjectives are derived from verbs (or in a few cases from nouns), roots are classified as either verbs or nouns. Only the former can occur in isolation, though the latter appear without a suffix as the head of an adjective phrase (cf. Section 3.18). (Of course particles, such as the nominalizing marker se, are always free and cannot be inflected.) There are three possible patterns of segment structure for roots: CV, CVC, and CV_i V_j (i \neq j). This is stated in (9) below:

9) Segment Structure of Roots:
   +CV({C|V})+

Most affixes in Mooré are suffixes. The most common
structure for suffixes is -CV or -V; there is one suffix
with the form -C, i.e. the marker for mass nouns and abstract
nouns derived from verbs (cf. Section 3.13), -m. The only
prefix remaining in the language has the form V-, i.e. the
marker for human personal names, a-. The segment structure
for affixes is indicated in (10) below.

10) Segment Structure of Affixes
   a) Suffixes: -(C)(V)
   b) Prefixes: V-

Both (9) and (10) will be included in general morpheme struc-
ture conditions for the segmental and tonal structure of
roots and affixes (cf. (14) and (20) below).

3.5 Simple Verbs

As mentioned above the only type of root which may
stand alone without an accompanying suffix is verb root .
Verb roots are of two tonal types: high and low. Below in
(11), (12), and (13) are examples of these types. (I shall
use the infinitival/imperative form in citing all verbs.
Also, in the systematic phonemic representations, all bounda-
ry reduction conventions have applied and only vowels are
spelled for tone, though in actuality all segments are marked
for tone, cf. the MSC in (14) and (20).)

11) a) kó 'to cultivate' (CV) /#kó#/ 
b) kò 'to hammer something out' (CV) /#kò#/ 

12) a) yáge 'to tell a lie' (CVC) /#yág#/ 
b) yàge 'to make pottery' (CVC) /#yàg#/
13) a) k`ui 'to be in a mass' (CVV) /#k`ui#/  
b) k`ui 'to dry (Vi)' (CVV) /#k`ui#/  

Tonally, all verb roots are monotonic, i.e. they carry the same tone throughout. Thus, for instance, there are no roots with a diphthong nucleus of the form *CVV or *CVV (though see note 32 for a possible exception). Although noun roots do not occur in isolation, there is no evidence which indicates that they are any different. Thus I shall propose the Morpheme Structure Condition in (14), which states that all the segments of a root have the same tone. (14) is a restatement of (9) where C and V are cover symbols for complexes of features (cf. Section 1.2) and therefore it represents the positive MSC for the structure of roots:

14) Structure of Noun and Verb Roots:
\[
\left[ + \left[ C \right] \left[ V \right] \left( \left[ C \right] \right) \left( \left[ V \right] \right) \right] \\
\left[ N \right] \left[ H \right] \left[ V \right]
\]

3.6 Derived Verbs

There are several suffixes which may be added to verb roots to create derived verbs, e.g. -se, -ge, -me, -ne, -le. These have various functions such as changing an intransitive to a transitive verb, making a verb causative, changing a singular action to a plural action (i.e. "over and over again") etc. I shall be concerned only with tone here. As can be seen from the examples below, the meaning of these affixes varies from verb to verb.

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15) a) bì /#bì#/ 'to be ripe'
    b) bìise /#bì-se#/ 'to ripen; to cause to be ripe'

16) a) vú /#vú#/ 'to drag (Vt)'
    b) vúugì /#vú-gì#/ 'to drag something along (Vt)'

17) a) dìgè /#dìg#/ 'to be on the ground'
    b) dìglè /#dìg-le#/ [dìg'lè] 'to put something on the ground'
    dìglè /#dìg-le-gè#/ [dìg'lègè]18
    c) dìkè /#dìg-gè#/ 'to pick up something from the ground (singular action)'
    d) dìgsè /#dìg-se#/ 'to pick up something from the ground repeatedly (plural action); to harvest'

18) a) bògè /#bòg#/ 'to split or divide'
    b) bòkè /#bòg-gè#/ 'to break something into two pieces (singular action)'
    c) bògse /#bòg-se#/ 'to break something in several pieces (plural action)'

19) a) zì /#zì#/, [zì] 'to be seated'19
    b) zìndì /#zìn-dì#/ [zìndì] 'to sit down'

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c) ẓǐndagi /#zǐn-lì-gi#/ [ẓǐndəgi] 'to sit someone down'

When a verbal derivational suffix is added to a high tone root, an over-all high-low tone pattern results (cf. (16b), (17b), (17c), (17d)), the suffix being low; when added to a low tone verb root, the suffix is also low, which results in an over-all low tone pattern. From this we can make the generalization that verbal derivational affixes are always low. Though this is not so for nominal suffixes (cf. Section 3.7), I shall propose that at the systematic phonemic level all -CV and -V suffixes are low tone. In addition the prefix a- is always low at the systematic phonemic level and the suffix -m is always high. By the conventions discussed in Section 1.5, all of these facts, which are represented separately in the positive MSCs in (20a,b,c), can be stated in the positive MSC in (20d). (But in the case of MSCs the following condition, which does not hold for P rules, must be added for parentheses: in a condition where all elements are parenthesized at least one [+SEG] matrix must be chosen.)

20) Segmental and Tonal Structure for Affixes:
   a) \(-\begin{bmatrix} C \\ H \end{bmatrix}\begin{bmatrix} V \\ H \end{bmatrix}\) (e.g. -a, -ba)
   b) \(-\begin{bmatrix} C \\ H \end{bmatrix}\) (-m)
   c) \begin{bmatrix} V \\ H \end{bmatrix} - (a-)
   d) \(\langle -\begin{bmatrix} C \\ H \end{bmatrix}\rangle\langle -\begin{bmatrix} V \\ H \end{bmatrix}\rangle\langle -\rangle\langle -\rangle\langle -\rangle\langle -\rangle\langle -\rangle\)
3.7 Nouns with Simple Stems

In Mooré all nouns belong to a particular noun class which is marked both in the singular and plural by a suffix. Thus any noun in isolation always consists of a root plus a suffix. There are six major noun classes grouped according to combinations of singular and plural:21

<table>
<thead>
<tr>
<th>singular</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) -a</td>
<td>-ba</td>
</tr>
<tr>
<td>b) -re</td>
<td>-a</td>
</tr>
<tr>
<td>c) -ga</td>
<td>-se</td>
</tr>
<tr>
<td>d) -go</td>
<td>-do</td>
</tr>
<tr>
<td>e) -m</td>
<td></td>
</tr>
<tr>
<td>f) -fo</td>
<td>-i</td>
</tr>
</tbody>
</table>

The meanings ascribed to the classes are informal categories and there are several exceptions. While all verbal derivational suffixes have the form -CV, three nominal suffixes, the singular of class (a), the plural of class (b) and the plural of class (f), have the form -V.

For simple nouns (i.e. root plus suffix) there are three possible systematic phonetic tone patterns with -CV or -V suffixes: 1) low tone on the root and high tone on the vowel of the suffix (L-H) as in (21) (the systematic phonetic representations are also given in the examples below and will be explained further on):

---

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21) a) mòaagá [mwaŋá] /#mɔ-gá#/ 'a Mossi person'
    mòosé [mɔsè] /#mɔ-sè#/ 'Mossi people'

b) tûbré [tûbäré] /#tû-b-rè#/ 'ear'
    tûbá [tûbá] /#tû-b-á#/ 'ears'

c) tòeaagá [tw̡ɛ̞t̡á] /#tɔe-gá#/ 'baobab tree'
    tòeesé [tw̡éesè] /#tɔe-sè#/ 'baobab trees'

2) high tone on the root and high tone on the suffix vowel (H-H) as in (22):

22) a) bỳuga [bûyá] /#bù-gá#/ 'goat'
    bỳuse [bûvsè] /#bù-sè#/ 'goats'

b) pàga [pàyá] /#pàg-á#/ 'woman'
    pàgba [pàgbá] /#pàg-bá#/ 'women'

c) sàōore [sà̞r̢ré] /#sào-rè#/ 'liver'
    sàọa [sàwá] /#sào-à#/ 'livers'

3) high tone on the root and low tone on the suffix vowel (H-L) as in (23):

23) a) nóaaagà [nwáŋá] /#nó-gá#/ 'chicken'
    nósè [nóosè] /#nó-sè#/ 'chickens'

b) kúgrì [kúgarì] /#kù-g-rì#/ 'stone'
    kúgà [kúgà] /#kù-g-à#/ 'stones'

c) lìuugò [líuvyò] /#lìu-gò#/22 'bucket'
    lìuudò [líuvudò] /#lìu-dò#/ 'buckets'

In the case of mass nouns which take the suffix -m̊, the surface pattern is either low tone on the root and high on the suffix (L-H), e.g. (24a), or high tone throughout (H-H) e.g. (24b):

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24) a) kòom [kòom] /#kò-m#/ 'water'

b) káam [káam] /#ká-m#/ 'oil'

The suffix -m, then, is always high regardless of the tone of the root.

I have found no restrictions on the three above mentioned tone types with respect to their occurrence with the various segment structure types of root and suffix, though I have not listed examples of all possible combinations. Note also that there are no nouns with a L-L surface pattern.

There is good evidence that the tone of the root in H-H words such as those in (22) is low at the systematic phonemic level. Whenever these roots appear without a suffix, as is the case when they are the head of an adjective phrase, they behave exactly like normal low tone roots, e.g.

25) a) pága, sòngó = p̣ag ṣongó

woman good 'a good woman'

b) tükó, sòngó = ṭük ṣongó

box good 'a good box'

(In possessive constructions, H-H and L-H nouns also behave alike, cf. section 3.20.) Thus there appears to be two classes of low-tone noun roots, those that rise to high tone when accompanied by a suffix and those that remain low. Minimal pairs exist, e.g.:

26) a) sìdá 'truth'

b) sīda 'husband'
27) a) mo'go' 'the kingdom of the Moose'
   b) móogo 'straw'

If we reduce the high tone roots of H-H nouns to low at the systematic phonemic level, then the tone of suffixes is predictable from that of the root; i.e., the suffix vowel of a simple noun carries a tone which is polar (i.e. opposite) to that of the root to which it is suffixed. But the MSC for the morpheme structure of suffixes given in (20) permits only low tone suffixes and so the systematic phonemic representations for the nouns in (21) and (22) are low tone throughout.

Therefore, in order to achieve the polar value of the suffix tone after low tone noun and adjective roots, we need a rule to raise the final vowel of the suffix of nouns like (21) and (22). The same polar effect is found in other suffixes also, e.g. Aspect (cf. section 3.25). I shall defer the statement of this rule until the next section, where additional facts will be presented and incorporated (cf. section 3.8 (33) and (34)).

Finally there is a rule which applies to certain nouns and adjectives with low tone stems such as the nouns in (22) and raises all the low tones to high creating a surface tone pattern of high throughout:

28) Stem RAISING

\[
[-H] \rightarrow [+H]/[X/N] \left[ +RAISING \right]_{[AB]} Y \uparrow_{\text{Num}}\\
\left[ +BOUND \right]_{-SB}
\]

X and Y contain no [-SB]
Since there appears to be no phonological or grammatical conditioning which separates those words which undergo RAISING from those that do not (e.g. 21), I shall use a rule feature as the conditioning factor: the segments of words which undergo (28) are marked [+RAISING] while those of words which do not are marked [-RAISING]. The Number bracket on the right and the condition on the Variables in (28) stipulates that the word must be marked for number with a class suffix; this excludes pag in (25) (cf. the surface structure for adjective phrases in section 3.18).

The subscript matrices are used in the sense of the convention mentioned for DOWNSTEP in (6a) section 3.2 and are to be interpreted as follows: "any sequence of one or more lows marked [+RAISING] interrupted by zero or more suffix boundaries". Note that since POLAR TONE (34) applies before RAISING, the final tone of the suffix will be high, e.g. pága 'woman': /LLL-L#/ \rightarrow (POLAR TONE) #LLL-H# \rightarrow (RAISING) #HHH-H#; pagba 'women': /LLL-LL#/ \rightarrow (POLAR TONE) #LLL-LH# (RAISING) #HHH-HH#. (The reason for this ordering of rules is explicated in the comments preceding the statement of rule ordering in section 3.18 (73).)

Below in (29) are partial derivations of the simple nouns in (21b) and (22b) which will illustrate the application of POLAR TONE and stem RAISING. I shall assume that all derivations begin after the boundary reduction conventions have applied. (These derivations are presented here
even though POLAR TONE is actually formulated in the next section.)

29) a) tɔbɔ̀rɛ́ (21b) 'ear'  #tɔb-rɛ̀#  
LLL LL  
_____H POLAR TONE (33b)  
#LLL-LH#  

b) pɔ́ɡa (22b) 'woman'  #pɔ́ɡ-à#  
LLL L  
H POLAR TONE (33c)  
HHH RAISING (28)  
#HHH-H#  

(Note that tɔbɔ̀rɛ́ in (29a) is marked [-RAISING] while pɔ́ɡa in (29b) is marked [+RAISING]. This is not evident from the derivations.)

3.8 Nouns with Complex Stems

Some nouns have stems of the following types: CVČ- and CVCC-. I shall consider such stems to be complex, consisting of a root and a suffix, though, in many cases, it is not possible to isolate the simple root of these complex stems in current usage. (This does not argue against their being considered complex, since it is common in natural language to find morphologically bound roots, e.g. English cran- in cranberry.) Thus the systematic phonemic structure of the words given in (31) and (32) would be that represented by the schema in (30).  

30) [\#
Stem
[ [+CV(C)+] [-CV] 
Stem
[-CV]#] ]

_54._

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As can be seen from the examples below, the surface tone patterns for nouns with complex stems are in many cases different from those with simple stems.\(^\text{27}\) (In (31) and (32) and all of the following examples, when using the symbols H and L to indicate tone, I shall mark downstep only on H, though it is present on L as well.)

31) a) tỳúsùgo [tỳ̃uːsėː_ATOM] /#t̚u-s̚-g̚o#/  
\quad L \enspace H_{1}L  
  'a pad for carrying a load on the head'

tỳúsòdò [tỳ̃uːsɛːd̚o] /#t̚u-s̚-d̚o#/  'pads'
b) gömbègo [g̚ómb̚èŋ̚o] /#g̚öm-b̚-g̚o#/  'praying mantis'
\quad L \enspace H_{1}L  
gòmb̚òdò [g̚ómb̚èd̚o] /#g̚öm-b̚-d̚o#/  'mantises'
c) bèndè [bènd̚è] /#b̚èn-d̚-r̚è#/  'drum'
\quad L \enspace H_{1}L  
bèndá [bènd̚á] /#b̚èn-d̚-a#/  'drums'

32) a) tàangà [t̚aːŋ̚g̚a] /#t̚a-m̚-g̚a#/  'shea tree'
\quad H \enspace H_{1}L  
táamsé [t̚аam̚s̚è] /#t̚a-m̚-s̚è#/  'shea trees'
b) tàamdé [t̚aːmd̚è] /#t̚a-m̚-r̚è#/  'shea nut'
\quad H \enspace H_{1}L  
táamà [t̚aːm̚à] /#t̚a-m̚-a#/  'shea nuts'
\quad H \enspace L  
c) sàanà [s̚aːn̚à] /#s̚á-n̚-a#/  'stranger'
\quad H \enspace L  
sàambà [s̚áamb̚à] /#s̚á-n̚-b̚à#/  'strangers'
\quad H \enspace H_{1}L  
d) bëngré [bëŋ̚g̚ré] /#b̚e̚n-ŋ̚-r̚è#/  'bean'
\quad H \enspace H \enspace H_{1}L  
bëngà [bëŋ̚g̚à] /#b̚e̚n-ŋ̚-a#/  'beans'
\quad H \enspace L
Not only are some of the surface patterns different from nouns with simple stems, e.g. L-HL (cf. 31) and H-H₁ (cf. 32), but in some instances the tone of the singular differs from that of the plural in the same noun (cf. (31c), (32b,c, and d)). Such a difference between singular and plural of the same noun always occurs when the segmental structure of the suffix is different, i.e. -CV vs. -V (cf. (31c), (32b, c, and d)). In all of the above examples -CV suffixes are -HL after low stems (e.g. 31) and -HH₁ after high stems (e.g. 32), while -V suffixes are -H after low stems (cf. (31c)) and -L after high stems (cf. (32b, c, and d)).

With the added data from complex nouns, we can now formulate a rule for polar tone in suffixes which will raise the low tone of the vowel of a suffix to high when the suffix is preceded by a low stem. Nominal and adjectival suffixes and Aspect (though the perfective is an exception in some dialects) are subject to this rule, while verbal derivational suffixes are not. I shall assume that suffixes which undergo POLAR TONE are marked [+INFLECT] while those that do not are [-INFLECT].

As was shown in (section 3.7), in simple nouns the vowels of both -CV and -V type suffixes are polar to the tone of the root; this is captured by the rules given in (33b) and (33c) below. In the case of complex nouns such as those in (31), the rule in (33b) applies to the suffix of the complex stem making the vowel of that suffix polar (i.e. high)

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to that of the preceding root; then (33d) applies to the vowel of a -CV suffix which is attached to a complex stem and makes the tone of the vowel of that suffix polar to that of the preceding suffix (i.e. if the preceding suffix is low, then (33d) applies, e.g. the nouns in (32)). However, when a -V suffix is attached to a complex stem, the tone is polar to the initial tone of the stem and not to the immediately preceding suffix, e.g. plural of (31c), (32b), (32d), and the singular of (32c); thus the rule in (32a) applies to the -V suffix in (31c) and raises it to high.

33) a) [-H] \rightarrow [+H]/#[-H]_1 -CV- \[
\begin{array}{c}
\text{V} \\
+\text{INFLECT}
\end{array} \]
X

b) [-H] \rightarrow [+H]/#[-H]_1 -C \[
\begin{array}{c}
\text{V} \\
+\text{INFLECT}
\end{array} \]
X

c) [-H] \rightarrow [+H]/#[-H]_1 - \[
\begin{array}{c}
\text{V} \\
+\text{INFLECT}
\end{array} \]
X

d) [-H] \rightarrow [+H]/[-H]_1 -C \[
\begin{array}{c}
\text{V} \\
+\text{INFLECT}
\end{array} \]
X

By the use of the formalism for disjunctive ordering and variables on features (cf. section 1.5), the above rules can be collapsed into the rule in (34). (Cover symbols for boundary elements are used wherever only one type of boundary is referred to.)

34) POLAR TONE in inflectional suffixes:

\[
[-H] \rightarrow [+H]/\left[+\text{BOUND}\right]_{\alpha AB} [-H]_1 -(C(V-)[V] \begin{array}{c}
\text{V} \\
+\text{INFLECT}
\end{array} \]
X
\]
It is assumed that (34), like part (b) of DOWNSTEP (section 3.2 (6b)), is a left-to-right rule in that it applies first to the leftmost suffix within a word and then moves to the next suffix to the right and so on throughout the word. This is necessary in order to prevent an incorrect output, e.g. if one applied (34) to (31c) starting at the right one would get *[bèndärè] instead of the correct *[bèndärè]: */CV-CV-CV#/ → (33d) #CV-CV-CV# → (33b) → *#CV-CV-CV#. The left-to-right convention assures that [−AB] will be interpreted as [−AB] before [+AB] because the leftmost boundary of a word is always [−AB], and therefore (33a, b, c) will be chosen before (33d).  

Before going on to formulate the tonal assimilation rule, let us add a rule which is very general in nature and which operates at all levels within words and phrases: suffix vowel elision. In Mooré, any non-nasal suffix vowel which is not in utterance final position is elided. (The stipulation of 'non-nasal' excludes the definitizer -(w)̄ which has the form of a suffix but whose vowel never elides (cf. section 3.17); no other suffixes have nasal vowels.) I shall make a distinction in the rules of Mooré between the process of elision and that of deletion. Elision is characterized as a change from [+SEG] to [−SEG] for a given matrix or set of matrices. All the rest of the features for that matrix remain the same and can be referred to or acted upon by other rules. Deletion, on the other
hand, removes the entire matrix, i.e. \([f_1, f_2\ldots f_n] \rightarrow \emptyset\).

Eventually, all \([-\text{SEG}]\) matrices are deleted. In (35) below the suffix vowel elision rule is given:

\[
\begin{array}{c}
\text{V} \\
\text{[+SEG]} \rightarrow \text{[+Boundary]} \\
\end{array}
\]

(35) operates at the word level in words with complex stems where the final vowel of the stem suffix elides as a result of the addition of the outer suffix, e.g. cf. the nouns in (32).

As can be seen in the phonetic representations, in some cases an epenthetic vowel \([ə]\) appears at the phonetic level in place of a systematic phonemic vowel, e.g. compare the singular and plural of (32d): \(\text{b\accent\circ n\acute{g}\grave{r}\acute{e}} /\#\text{b\acute{e}n-g\grave{V}-r\grave{e}}\#//\) \(\text{b\acute{e}ng\grave{a}} /\#\text{b\acute{e}n-g\acute{V}-\grave{a}}\#//\) \(\text{b\acute{e}ng\grave{a}}\). I shall consider this to be the result of a late rule of vowel epenthesis which I shall not attempt to give a formal account of in the present work. (For an informal description of vowel epenthesis cf. section 2.2 (8) through (12).) With respect to vowel elision the orthographic representation reflects the stage after which the vowel elision rule in (35) has applied.

There are two types of words which cannot be adequately accounted for by the rules so far proposed. The first type is complex nouns with initial high tone, such as those in (32). They have a surface pattern of H-H-H\(_1\), whereas by the rules given above they are assigned a H-L-H pattern, a pattern which does not exist at the word level in Mooré', e.g.
(32d) bëngré 'bean': */#bèn-gỳ-rè#/\, #HHH-LL-LL# \(\rightarrow\) (POLAR TONE) #HHH-LL-LH# *[bèngàrè].

The second type comprises derived verbs and simple nouns with -CV suffixes and initial high tone where the surface pattern is high throughout except for the tone of the final vowel which is low (i.e. H-H-HL or H-HL)\(^3\). The MSC for suffixes in (20) allows only low tone throughout for all suffixes, e.g. kùgùrì [kùgári] (23b) 'stone': */#kùg-ri#/\, #HHH-LL#: *[kùgàrì]; dìgìgè [díɣàlìɣè]: */#díg-ì-ge#/\, #HHH-LL-LL#: *[díɣàlìɣè].

From the above examples it can be seen that there is need for a tonal assimilation rule which will raise to high any sequence of low tones preceded by a high tone within a word. In the case of type-one words (i.e. those in (32)) where the sequence of low tones is followed by a high, the lows are raised and the high becomes a non-automatic downstep. I shall claim that the surface non-automatic downstep results from the influence of the systematic phonemic low tone of the preceding suffix in accordance with the principles formalized in the DOWNSTEP rule in section 3.2 (6).

However, for reasons which will be made clear in the sections concerning the phrase level (cf. section 3.18 and 3.20), the tonal assimilation rule must precede DOWNSTEP. But this raises difficulties in the case of a H-L-H pattern, because with this ordering the assimilation rule will eliminate all the low tones and DOWNSTEP will
not apply. Therefore I shall consider that the assimilatory process, in the case of words where the assimilated lows are sandwiched between two high tones, includes the insertion of a [-SEG] low tone at the end of the sequence of lows which undergo assimilation; this inserted low does not undergo assimilation itself and so causes DOWNSHIFT to operate; it is deleted in the surface along with other [-SEG] matrices. (This is outlined in section 3.3 (8)).

Notice that type-two words, e.g. (23b) and (17b) as mentioned above where the sequence of low tones extends to the end of the word, differ from type-one words in that all but the last of the sequence of lows are raised. Clearly we want to relate assimilation in the two types of words by achieving it with the same rule. This can be accomplished if the insertion of [-SEG] low tone in type-one words is stated as a separate operation which precedes the operation of raising the lows. (36a) is a statement of this low tone insertion while assimilation in both types of words is then expressed in (36b) as a raising of all but the last of a sequence of lows within a word which is preceded by a high tone and followed by a high tone or a word boundary, the last low being the previously inserted [-SEG] in the case of type-one words.

36) Tonal ASSIMILATION in words:

\[
\begin{align*}
a) \ \emptyset & \Rightarrow \left[ \begin{array}{c} -H \\ -SEG \end{array} \right] /\left[ +H \right] \left[ \begin{array}{c} -H \\ +AB \end{array} \right]_0 \quad \rightarrow \quad \left[ +H \right] X
\end{align*}
\]
b) \([-H] \to [+H]/[+H]/\overline{[-H]}(\#)([+H])X\]
\[
[+AB]_O \ h
\]

The subscript matrices in (36) are to be interpreted as follows: "a sequence of one or more low tones interspersed by zero or more affix boundaries". By 'interspersed' I mean: "a sequence of lows which is preceded by and/or interrupted by and/or followed by zero or more affix boundaries". For example, in the derivations in (38) below, the sequence is interpreted as -LL-L in (38a) and as -L in (38b).

Finally, there is a rule which deletes all [-SEG] matrices:

37) [-SEG] DELETION:

\([-SEG] \to \emptyset\]

(37) is a very late rule and removes all matrices marked [-SEG], including boundary elements.

Below in (38) are derivations for some words which utilize the above rules. Tones which are [-SEG] are enclosed in parentheses; although I have not formally presented the VOWEL EPENTHESIS rule in this paper, I have included it as a part of the derivations:
38) a) diğlê (17b) 'to put something on the ground'

# d i g l e g e #

H H H L L L L

(L) VOWEL ELISION (35)

H(H) H ASSIMILATION (36b)

iddleware VOWEL EPENTHESES

L1 DOWNSTEP (6)

φ φ φ φ φ [-SEG] DELETION (37)

H H H H H H L1 [díğlê̊ye̊]

b) ñëndë̀ (31c) 'drum'

# b e n d v e r e #

L L L L L L L

(H) V ELISION (35)

(H) POLAR TONE (34)

H ASSIMILATION (36b)

iddleware VOWEL EPENTHESES

(H1)H L L L1 DOWNSTEP (6)

φ φ φ φ φ [-SEG] DELETION (37)

L L L L H H H H L1 [òóòóò]

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c) bendá (31c) 'drums'

# ben - d V - a #

L L L L L L

(L) V ELISION (35)

H POLAR TONE (34)

H₁ DOWNSTEP (6)

∅ ∅ ∅ ∅ ∅ ∅ [ -SEG] DELETION (37)

L L L L H₁ [bendá]

d) bengré (32d) 'bean'

# ben - g V - re #

H H H L L L L

(L) V ELISION (35)

H POLAR TONE (34)

(L) ASSIMILATION (36a)

H (H) H ASSIMILATION (36b)

∅ V EPENTHESIS

(L₁) H₁ DOWNSTEP (6)

∅ ∅ ∅ ∅ ∅ ∅ ∅ [ -SEG] DELETION

H H H H H H H₁ [bengré]
e) benga (32d) 'beans'

\[\text{\# b e n ~ g V ~ a \#}\]
\[\text{H H H L L L (L) V ELISION (35)}\]
\[\text{H (H) ASSIMILATION (36b) L} _1 \text{ DOWNSTEP (6)}\]
\[\emptyset \emptyset \emptyset \emptyset \emptyset [-SEg] DELETION (37)\]
\[\text{H H H H L} _1 [\acute{\text{b}}\text{\'\'g\'\'a}]\]

**Derived Nouns**

There are several types of nouns which are derived from verbs by the addition of various nominal suffixes. In all cases they can be handled by the rules proposed above in previous sections.

3.9 **Verbal Nouns (Gerunds)**

Verbal nouns are formed by adding the suffix -bo, -go, or -re to the verb stem. (Generally simple verb stems, especially of the type CV, take -bo while complex stems take -re or -go, although there are a number of simple CVC stems which take -re or -go.) Verbal nouns are used to form action nominals:

39) a) `a paba boanga. 'He beat (pabe) a donkey.'

b) `a boang pabre... 'His beating of a donkey...'

The tonal patterns for verbal nouns are very regular with few exceptions. Those formed with simple low tone verbs (e.g. (40a) below) have the same surface pattern (H-H) as simple low tone nouns which undergo stem RAISING (28).
Thus they are marked [+RAISING] and follow the derivational path outlined in (29b). Verbal nouns formed with simple high tone verbs (e.g. (40b)) exhibit a surface H-L pattern like high tone simple nouns (e.g. (23)). Verbal nouns formed with derived verbs with initial high tone (e.g. (40c)) have a surface H-H₁ pattern and follow the same derivational path as complex nouns with initial high tone (e.g. (38d)). But notice that verbal nouns formed with low-tone derived verbs (e.g. (40d)) do not follow the derivational path of complex nouns with low-tone stems (cf. (38b)) because the first suffix, i.e. the suffix of the derived verb is [-INFLECT] and therefore does not undergo POLAR TONE (34) while the final nominal suffix does. This results in an overall L-H₁ pattern; a derivation for this type of verbal noun is given in (40e).

40) a) dì 'to eat'
   díbo 'eating' /#dì-bo#/ (+RAISING)

   wàbe 'to chew'
   wàbre 'chewing' /#wàb-re#/ (+RAISING)

b) tá 'to arrive'
   tábò 'arrival' /#tá-bo#/

   dýge 'to boil (food)'
   dýgbo 'boiling' /#dýg-bo#/

c) báasè 'to complete' /#ba-se#/
   báasgo-báaségo 'completion' /#ba-se-gò#/
d) yìki 'to lift' /#yìg-ì#/ 
   yìk̀í [yìkàrî] 'lifting' /#yìg-ì-ì#/ 

e) #yìg-ì-ì#/ 
   LLL LL LL 
   H POLAR TONE (34) 
   #LLL-LL-LH# 

3.10 Agent Nouns 

Agent nouns are formed from verbs by adding the suffixes of the a/da noun class to the imperfective of the verb. The imperfective is formed by adding the suffix -da to the verb. Since -da is a [+INFLECT] suffix, it undergoes POLAR TONE (34) as do all the nominal suffixes. (For further comments on the imperfective cf. section 3.25.) 

Agent nouns formed from simple low tone verbs have a H-H surface pattern and therefore are marked [+RAISING]. 

41) a) dà 'to buy'; imperfective = dàdà 
   b) dàdà 'buyer' /#dà-dà-à#/ (+RAISING) 
      dàdàba 'buyers' /#dà-dà-bà#/ (+RAISING) 

The tone pattern assigned to (42b) by POLAR TONE is that of nouns with initial low tone complex stems like those in (31), i.e. #dà-dà-à# and #dà-dà-bà# (cf. the derivations in (38b) and (38c)). RAISING (28) then obliterates these patterns by making them high throughout (cf. note 25). 

Agent nouns formed from simple high tone verbs have a H-L surface pattern and a H-H₁ pattern in the plural. They follow the same derivational path as do other complex nouns.
with initial high tone stems (cf. (31) and the derivations in (38d) for the $H-H_1$ pattern and (38e) for the $H-L$ pattern).

43) a) kú 'to kill'; imperfective = kúudá
   
b) kúudá 'killer' /#kú-dá-a#/ .
   
kúudbá 'killers' /#kú-dá-bá#/ .

Agent nouns formed with low tone derived verbs, e.g. (44) below, show a L-$H$ surface pattern in the singular (i.e., where the final suffix is $-V$) and a L-$H-L$ surface pattern in the plural (i.e., where the final suffix is $-CV$); those formed with high tone derived verbs, e.g. (45), have a $H-H_1$ surface pattern in the singular and a $H-H_1-L$ surface pattern in the plural.

44) a) kòose /#kò-se#/ 'to sell'; imperfective = kòosdá
   
b) kòosdá [kòosédá] 'seller' /#kò-se-dá-a#/ .
   
kòosdbá [kòosédábá] 'sellers' /#kò-se-dá-bá#/ .

45) a) gúlsè /#gúl-se#/ 'to write'; imperfective = gúlsdá
   
b) gúlsdá [gúlsédá] 'writer' /#gúl-se-dá-a#/ .
   
gúlsdbá [gúlsédábá] 'writers' /#gúl-se-dá-bá#/ .

In (44b) and (45b) essentially the same path of derivation is followed as in (38c and d) and (38e and d) respectively; the main difference is that the suffix of the derived verb is [-INFLECT] and therefore POLAR TONE skips this suffix and begins with the imperfective $-da$. Thus the sub-rules of (34) which are used are (33d) and, in the case of the singular of (45b), the rule given in (a) of note 28. Below in
(46) is a derivation for the plural of (45b).

46) gułsdá (44b) 'writer'

# g y l - s e - d a - a #
HHHL L L L L

(L) (H) V ELISION (35)
H POLAR TONE (34)

(L) ASSIMILATION (36a)
H(H) H ASSIMILATION (36b)

\[ \]
V EPENTHESIS

(L1)(H1) H1 DOWNSTEP (6)

\[ \phi \ \phi \ \phi \ \phi \ \phi \ \phi \ \phi \ \phi \ [-SEt] DELETION (37)

HHHHHH H1 [gułsdá]\]

3.11 Concrete and Instrumental Nouns

Concrete nouns are formed by adding the suffixes of the
-ga/-se noun class directly to the stem of the verb (minus
aspect). The foregoing rules will generate the proper pat-
terns for these nouns. (Occasionally one finds human nouns
in this class, e.g. (47d).)

47) a) gé 'to lie down'
gáagá /#gé-gá#/ 'bed',

b) zì 'to be seated'
zíiga /#zì-gá#/ 'seat' (+RAISING)

c) dà 'to buy'
dáagá /#dà-gá#/ 'market'

d) géemè /#gé-mè#/ 'to be crazy'
géengá /#gé-mè-gá#/ 'crazy man'
Note that (47b) undergoes RAISING while (47c) does not (also cf. note 24 with respect to this point).

By adding -ga/-se to the imperfective, instrumental nouns are formed.

(48) mòke /#mòg-gè#/ 'to suck';

imperfective = mòkdá
mòak’dgà [mòak’d’gà] /#mòg-gè-dà-gà#/ 'sucker'

Concrete nouns follow the same derivational path as the plural of agent nouns (cf. 3.10).

3.12 Resultative Nouns

The addition of -re/-a (for count nouns) or -do (for mass nouns) to the verb stem brings about the formation of nouns standing for the result of the action of the verb. The same rules that apply to other nouns will generate the proper tone patterns for these:

(49) (a) gôme 'to speak'
    gómè /#góm-rè#/ 'word'
    gómà /#góm-à#/ 'words'
(b) yóde 'to tie a knot'
    yódre /#yód-rè#/ 'knot' (+RAISING)
    yóda /#yód-à#/ 'knots' (+RAISING)
(c) zàbe 'to dispute'
    zàbré /#zàb-rè#/ 'dispute'
    zàbà /#zàb-à#/ 'disputes'
(d) yáo 'to pay'
    yáoodò /#yáo-dò#/ 'salary'
3.13 Abstract Nouns

Many verbs, especially stative adjectival verbs, can form an abstract noun by adding the suffix for mass nouns, -mü (cf. (24)). Frequently in abstract nouns of this type there is what I shall call a "stem formative suffix" of the form -dV, -lV, or -sV which is inserted between the verb stem and -mü. These behave like verbal derivational suffixes in that they do not undergo POLAR TONE. I shall analyze them as suffixes which are marked [-INFLECT] and I shall assume that they are subject to the MSC for suffixes in (20) and therefore they are always low tone at the systematic phonemic level. These stem formative suffixes most often occur with CV verb roots (cf. 50a and b); if the verb is a derived verb of the form /CV-CV/, no stem formative is added (cf. 50d); in the case of derived verbs ending with the suffix -me, -me either drops out altogether (cf. 50e) or is replaced by a stem formative (50f).

(50) (a) dà 'to buy'

dåasäm [dåasäm] /#dà-śv-mü#/ 'purchase'

(b) ka 'to not exist'

kåaläm [kåaläm] /#kå-lV-mü#/ 'non-existence'

(c) dögé 'to give birth'

dógm [dógm] /#dög-m#/ 'birth' (+RAISING)

(d) beèle /#be-le#/ 'to greet'

beelm [beelm] /#be-le-mü#/ 'greeting'
(e) yámé [yálmè] /#{yál-mè}/ 'to be long'
  yám [yálm] /#{yál-m}/ 'length'

(f) bédmè [bèdmè] /#{bèd-mè}/ 'to be big'
  bédlm [bèdlm] /#{bèd-l'm}/ 'bigness'

3.14 Adjectives

There are probably no, or at best very few, 'pure' adjectives in Moore. Most can be traced to an underlying verb. Adjectival sentences in English can be translated in Moore in two ways: as a sentence with a stative verb as predicate (e.g. (51)), or with the copula ya 'to be' plus an adjective derived from a stative verb, e.g. (52).

(51) a) à bédma mé He is big. ('He bigs')
    bédmè = 'to be big'

  b) à zíisə mé It is heavy ('it heavies')
    zíisə = 'to be heavy'

(52) a) à yañ bédre' He is big.

  b) à yañ zíisgá It is heavy.

Frequently there is a suffix -me on stative adjectival verbs which in some cases is deleted in the derived adjective (e.g. bédmè, bédre in (51a) and (52a)). Although at one time there was undoubtedly concord between the subject NP and a predicate adjective, in the present stage of development there is only number agreement and no class concord. Each adjective belongs to a noun class or sometimes to two or three in the singular (cf. (53d) below). The same rules that account for nouns will provide the correct tone patterns for adjectives.
(53) a) wógmè /wóg-mè#/ 'to be long'
    wóko /wóg-go#/ sg. 'long'
    wóngò /wóg-ò#/ pl.

b) màge 'to be flat'
    màkà /mag-gà#/ sg. 'flat'
    màgsè /mag-sè#/ pl.

c) bì 'to be ripe'
    bìiga /bì-gà#/ sg. 'ripe' (+RAISING)
    bìise /bì-se#/ pl. (+RAISING)

d) màasè /maá-se#/ 'to be cool'
    màasà /maá-se-à#/ 
    màasgà /maá-se-gà#/ 
    màasré /maá-se-re#/ 
    màacoosgo /maá-se-go#/ 
    màassè /maá-se-se#/ pl.

e) pëele /pëe-le#/ 'to be white'
    pëaalga /pëe-làga#/ sg. 'white'
    pëelëse /pëe-le-se#/ pl.

f) nóome /nòo-mè#/ 'to be pleasant'
    nòogò /nòo-go#/ sg. 'pleasant'
    nòosè /nòo-se#/ pl.

Some adjectives are derived from non-stative verbs.
Usually the imperfective stem is used. Such adjectives
generally have a passive sense.
(54) a) ko 'to cultivate'; imperfective = kòodà
kòoadgà [kwaadìya] /#kòʊḏ̌a-gà#/ sg.
kòodrè [kòodìrè] /#kòʊḏ̌a-rè#/ 'cultivated'
kòodse [kòotsè] /#kòʊḏ̌a-sè#/ pl.

b) dà 'to buy'; imperfective = daàdé
daàdgà [daàdìya] /#dà-dà-gà#/ sg. 'buyable'

Adjectives of this type follow the same derivational paths as do agent nouns (cf. section 3.10), except that RAISING does not apply to those formed on low-tone simple verbs (compare (54b) to the plural of (41b) and cf. the comments following (41b)). RAISING does apply to many adjectives with simple stems, however, e.g. (53c).

3.15 A Note on Long Vowels

M. Houis in his article on Moore orthography (Houis 1960) suggests that certain long vowels in Moore are automatic, i.e. the vowel of a CV root is automatically lengthened when a suffix is added. He is hesitant to say that all long vowels come from this source. If we take into account the tonal patterns of words, we can show that long vowels are not distinctive at the systematic phonemic level. For example there are numerous minimal pairs at the surface level (disregarding tone) of CVC vs. ČVC verbs, e.g.

(55) a) kòge 'to prepare millet'
    b) kòogè 'to clear a path'

(56) a) bàse 'to leave'
    b) bàase 'to dismount'
(55a) and (56a) are real CVC verbs, while (55b) and (56b) are derived verbs consisting of a CV root plus -CV suffix. (k̕o̕ = 'to cultivate'; k̕a = 'to fix something to something'.) As mentioned in the comments on derived verbs (cf. section 3.6), verbal derivational suffixes always carry low tone. It was also pointed out that verbal nouns derived from high tone verbs carry a non-automatic downstep on the nominal suffix and that the stems of verbal nouns derived from low tone derived verbs do not undergo raising (cf. section 3.9). There is a fair number of verbs which have long vowels (i.e. CVC) for which there does not seem to be any isolatable root verb, e.g.

(57) a) k̕i̕me 'to fry' k̕i̕o̕ong̕o 'frying'
   b) k̕i̕me 'to guard animals' k̕i̕o̕ong̕o 'guarding'
   c) *k̕i̕
   d) *k̕`

Yet such verbs always exhibit the tone patterns of derived verbs and their derivatives. I have found no CVC verbs with a H-H tone pattern, nor any verbal nouns derived from such verbs which exhibit a H-H or H-L pattern, which one would expect if these verbs were simplex. From this we can deduce that these words are complex at the systematic phonemic level, even though speakers cannot use the root verb in isolation. Thus the same rule which lengthens the vowel of a CV root when followed by a suffix (cf. section 2.2(1)) will take care of the long vowel in words like those in (57a) and

---75---
(57b), which have systematic phonemic representations of
/\kį-mè#/ and /\kį-mè#/ respectively.

Phrase Level

The distinction of 'word level' vs. 'phrase level' is
a convenient syntactic division; however, as we shall see
below, many of the constructions which seem to qualify syn-
tactically as phrases behave phonologically like words and
will be so treated.

3.16 Noun Phrase

I shall assume the following phrase structure expansion
for NP:

(58) \( NP \rightarrow NOM\ \overset{35}{D} \)

\[
\begin{align*}
NOM & \rightarrow \{ NOM\ S \} \\
N & \rightarrow \{ N\ NUM \}
\end{align*}
\]

(The above rules are not complete in that they do not account
for phrasal conjunction and nominalizations. These things
will be dealt with in Part II.) \( S \) is the source
for relative clauses. \( D(\text{eterminer}) \) includes various quanti-
fiers and other determining particles such as: \( \kik \) 'the;
that', \( fa' all', \( nĩga' \) 'a certain; some', \( kãga' \) 'that'; or
it may be \( \emptyset \) (i.e. indefinite) in the surface. \( NUM(ber) \) is
expanded into sg/pl and dominates the nominal/adjectival
suffixes listed in section 3.7; \( N \) is 'noun'.

3.17 The Definitizer \( kĩ\).

The definitizer in Mooré has the form \( kĩ\) and comes at
the end of the NP which it qualifies.
It also occurs at the end of relative clauses with definite antecedents and at the end of factive nominalizations. The tone of the vowel of wà in the surface is high after low (e.g. (59a)) and non-automatic downstep after high (e.g. (59b)); the w carries the same tone as that of the segment which precedes it and blends into the tone of á:

(59)  

a) náaf ningá yamb sè kú à wà ... [k'vavá]  
   cow/the/you/REL/killed/it/wà  
   'The cow that you killed...'

b) kí wá [kí vá] 'the millet'

If the word which precedes wà ends in an elided vowel (i.e. through application of V ELISION (35)) or a nasal consonant (e.g. kòóm 'water'), the w of wà elides and the remaining á merges with the preceding word like a -V suffix. When it merges with a word ending in a high tone, á carries a high-nonautomatic downstep glide (Hh₁) (e.g. (60a,b,c)); when the preceding word ends in elided low tone preceded by a high, á is non-automatic downstep (e.g. (60d)):

(60)  

a) boảngá 'donkey'  
   boảngá [bwaŋgá] 'the donkey'

b) págá 'woman'  
   págá [páyá] 'the woman'

c) bengré 'bean'  
   bengré [benggré] 'the bean'

d) némdo 'meat'  
   némdo [némdo] 'the meat'

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I shall assume that \( \tilde{w} \) has a LH tone pattern at the systematic phonemic level and that it is bounded on the left by a suffix boundary: \( /-\tilde{w}a/ \).\(^{37}\) I shall also say that the definitizer is included within the word boundaries of the word that it definitizes. As can be seen from the derivation in (62), the tone of definitized words is handled by the same rules as apply to other words. However, there is need of two additional rules, one that elides \( w \) of \( \tilde{w} \) under the conditions described above, which I shall not write out in this paper, and another to account for the glides in (60a,b,c). Such is (61) below:

(61) TONAL GLIDE FORMATION:

\[
\emptyset \Rightarrow \begin{array}{c}
\left[ -H \right] \\
\left[ +H \right] \\
\left[ -SEG \right] \\
\left[ +SEG \right]
\end{array}
\left[ \begin{array}{c}
\left[ -H \right] \\
\left[ +H \right] \\
\left[ -SEG \right] \\
\left[ +SEG \right]
\end{array} \right]
\]

The low tone segment inserted by (61), which is eventually raised to high by ASSIMILATION, is incorporated into \( \tilde{a} \) by a low level phonetic rule which is not included here. Below in (62) is a derivation for the definite form in (60a).
(62)

# b o n - g a - w ː #
L L L L L L H
(H)
(L)
H
(L)
H₂ (H₁) H₁ (H₁)(L₁)H₂
Ø Ø Ø Ø Ø Ø Ø
L L L L L L H₁ H₂

[boŋaʁ] [bwaŋaʁ']

(The a in the stem of (60a) is inserted by a rule implied by the remarks in section 2.2(9).)

3.18 Adjective Phrase

I shall assume that adjective phrases originate in deep structure as a relativized NP (e.g. dór sè ya wókò 'a stick which is long...' → do' wokò 'a long stick...'). In the surface structure, adjective phrases are composed of a noun stem (minus its class suffix) followed by an adjective (cf. (64a)). The suffix for the adjective qualifies the entire NP. If there is more than one adjective, only the last one will carry a suffix (cf. (64b)); thus there is only one class suffix per adjective phrase. Therefore I shall assume that in the process of reduction to adjective phrase, the adjective of the relative clause is attached as the rightmost
member of the NOM node which dominates the antecedent noun (cf. note 35 for the deep constituent structure of relative clauses) and that all but the rightmost of the nominal/adjectival class suffixes under the antecedent NOM node are deleted; also, I shall assume that NP, like all major constituents, is bounded on each side by the boundary element #. Adjective phrases, then, have the structure shown in (63) upon entering the P rules (i.e. after all MSC and boundary reduction conventions—cf. section 1.6 a,b,c):

\[
(63) \begin{array}{c}
\# \left[ \text{NS + AS (+AS)}^n \ - \ \text{suf.} \right] \ (\text{Det.}) \ # \\
\text{NP} \quad \text{NOM} \quad \text{NOM} \quad \text{NP}
\end{array}
\]

(64) below gives some concrete examples of this (the phonemic forms for the individual words listed under each adjective phrase are in the form which is prior to boundary reduction):

\[
(64) \begin{align*}
a) \quad & \text{dó wokò} /\#dó+wó-g-o#/ \ 'a\ long\ stick' \\
& \text{dóorè} /+dó+-rè/ \ 'stick' \\
& \text{wókò} /+wó-g+-g-o/ \ 'long' \\
& \text{b) dó vog kàdrè} /#dó+wog+káu+-rè#/ \ 'a\ long\ rough\ stick' \\
& \text{kàdrè} /+ká+-rè/ \ 'rough'
\end{align*}
\]

As we shall see, the same principles of tonal assimilation apply within adjective phrases as apply within words.

Table I below lists the possible surface patterns of adjective phrases with one and two adjectives. The vertical column on the left signifies the various types of nouns (1 through 5) and noun-stem-plus-adjective-stem combinations

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(6 through 10), while the row along the top (a through d) shows the different types of adjectives. For each noun (1 to 5) the following are provided: 1) the English gloss; 2) the surface form when appearing in isolation; 3) the systematic phonemic form of the stem before boundary reduction; 4) a schema in the form of capital letters (H = high, L = low) indicating the tone of the root after V ELISION and POLAR TONE. For each adjective (a to d) the same is provided except that the systematic phonemic representation is for the whole word and the schema in capital letters shows the surface tone of the adjective in isolation. The slots (6 through 10) show combinations of noun stem plus adjective stem with the adjectives kēegá 'green', wókò 'long', and ziiségá 'heavy'. The combinations of letters in the spaces indicate the surface tone patterns which result from combining the noun stems and noun stem plus adjective stem combinations in (1) through (10) with the adjectives (a) through (d) where '+' = root boundary and '-' = suffix boundary. The last two letters on the right of each pattern indicate the tone of the adjective. Downstep is marked with a subscript only on high tone, while downstep of low is unmarked. (Some of the combinations in Table I may not make good semantic sense, but each should be taken as representing the general pattern for all combinations of that tone type.)
<table>
<thead>
<tr>
<th>ADJECTIVES</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>'good'</td>
<td>/+som+-gò/</td>
<td>/+kỳd+-rè/</td>
<td>/+kàd+-rè/</td>
<td>/+bèd+-mè+-rè/</td>
</tr>
<tr>
<td>sònò</td>
<td>L-H₁</td>
<td>H-H</td>
<td>H-L</td>
<td>H-H₁</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOUNS</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) 'box' tukó</td>
<td>/+tỳg/+</td>
<td>L+L-H₁</td>
<td>L+H₁-H₁</td>
<td>L+H₁-L</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) 'calabash' wámde</td>
<td>/+wàm/+</td>
<td>L+L-H₁</td>
<td>L+H₁-H₁</td>
<td>L+H₁-L</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) 'stone' kúgré</td>
<td>/+kúg/+</td>
<td>H+H-H₁</td>
<td>H+H-H₁</td>
<td>H+H-L</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) 'bean' béngré</td>
<td>/+bént+-gY/ → H(-L)</td>
<td>H+L-H₁</td>
<td>H+H-H</td>
<td>H+H-L</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) 'drum' bëndré</td>
<td>/+bënt+-dY/ → L(-H)</td>
<td>L+H₁-H₂</td>
<td>L+H₁-H₂</td>
<td>L+H₁-L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N STEM + ADJ STEM</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6) 'box green'</td>
<td>/+tỳg++kè+/</td>
<td>L+L+L-H₁</td>
<td>L+L+H₁-H₁</td>
<td>L+L+H₁-L</td>
</tr>
<tr>
<td></td>
<td>L+L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) 'box long'</td>
<td>/+tỳg++wòg+/</td>
<td>L+H₁+H₁-H₂</td>
<td>L+H₁+H₁-H₂</td>
<td>L+H₁+H₁-L</td>
</tr>
<tr>
<td></td>
<td>L+H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8) 'stone green'</td>
<td>/+kúg++kè+/</td>
<td>H+H+L-H₁</td>
<td>H+H+H₁-H₁</td>
<td>H+H+H₁-L</td>
</tr>
<tr>
<td></td>
<td>H+L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9) 'stone long'</td>
<td>/+kúg++wòg&quot;/</td>
<td>H+H+H₁-H₁</td>
<td>H+H+H₁-H₁</td>
<td>H+H+H₁-L</td>
</tr>
<tr>
<td></td>
<td>H+H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10) 'stone heavy'</td>
<td>/+kúg++zè+-so/</td>
<td>H+H+L-H₁</td>
<td>H+H+L-H₁</td>
<td>H+H+H-H</td>
</tr>
</tbody>
</table>

|     |     |     |     |     |
Let us now explicate certain of the patterns of Table I. For the most part, the patterns which exhibit interesting tone changes are in columns (a) and (b) where low adjective root assimilates to a preceding high noun root bringing about a non-automatic downstep in the following high.

First, notice the difference between slots (1a) and (1b) (illustrated in (65a) and (65b) below) where the adjective sòngò in the former belongs to that class of words with low tone stems which do not undergo RAISING (cf. (28)) while the adjective kúdre in the latter belongs to that class of words with low tone stems which undergo RAISING. RAISING, then, accounts for the difference in the surface patterns of (65).

\begin{equation}
\begin{array}{l}
(65) \ a) \ (1a) \ tùg \ sòngò /\#tùg+sòm-gò#/ \ 'a \ good \ box' \\
\hspace{1cm} L \ L \ H_1 \\
\hspace{.5cm} b) \ (1b) \ tùg \ kúdre /\#tùg+kùd-rè#/ \ 'an \ old \ box' \\
\hspace{1cm} L \ \ H_1 \ H_1
\end{array}
\end{equation}

But note that the low tone noun stem of (2a) and (2b), wàm from wàmdè, (cf. (66a and b)) belongs to the class of roots which undergo RAISING, yet the tone patterns of the adjective phrases formed with it are identical to those formed with low tone roots which do not undergo RAISING (e.g. tûg from tûkó in (65)).

\begin{equation}
\begin{array}{l}
(66) \ a) \ (2a) \ wàm \ sòngò /\#wàm+sòm-gò#/ \ 'a \ good \ calabash' \\
\hspace{1cm} L \ L \ H_1 \\
\hspace{.5cm} b) \ (2b) \ wàm \ kúdre /\#wàm+kùd-rè#/ \ 'an \ old \ calabash' \\
\hspace{1cm} L \ \ H_1 \ H_1
\end{array}
\end{equation}

This merging of the two types of low tone stems results because RAISING applies only when the stem is accompanied by
a nominal/adjectival class suffix; if this condition is not met, as in (66) above where wam is followed by a root boundary, RAISING will not apply (cf. the remarks on RAISING following (28)).

In (3a) and (3b) adjective phrases with the two types of low stems in the adjective position behave the same when preceded by a high-tone noun stem, i.e. an overall $H+H-H_1$ tone pattern shows up for both as illustrated in (67):

(67) a) (3a) kúg songo' /#kúg+sɔm-go#/ 'a good stone'  
   $H$ $H$ $H_1$

   b) (3b) kúg kydré /#kúg+kýd-re#/ 'an old stone'  
   $H$ $H$ $H_1$

The initial lows of the adjectives in both (67a) and (67b) have undergone ASSIMILATION. The only way to account for the non-identity of (65a) and (65b) (where RAISING has applied to the adjective in the latter but not in the former) versus the identity of (67a) and (67b) (where ASSIMILATION has applied to both) is to posit the following ordering of rules: ASSIMILATION (36) precedes RAISING (28). In the case of stems marked [+RAISING] which have undergone ASSIMILATION, RAISING will not apply because all the lows will have been eliminated by ASSIMILATION.

Note that after noun stems of type (4) in Table I, adjectives of types (a) and (b) behave in the same way as they do after stems of types (1) and (2), i.e. ASSIMILATION does not apply and RAISING applies to type (b) adjectives (compare (68) below with (65) and (66)).
(68) a) (4a) bėng sîngô /#bèn-gN+sôm-gô#/ 'a good
   H L H₁ bean'

   b) (4b) bêng kûdrê /#bèn-gN+sôm-gô#/ 'an old
   H H H bean'

The fact that ASSIMILATION does not apply to low tone adjectives that follow noun stems of type 4 in Table I, which appear on the surface to have high tone, can be explained in a natural way, if we accept the analysis proposed above in section 3.8; that nouns of this type have complex stems of a high tone root plus a low tone suffix at the systematic phonemic level (cf. the examples in (32)). The final low tone of the suffix of the noun stem prevents ASSIMILATION from operating, i.e. the environment is not met, and therefore RAISING applies to the type (b) adjectives. 38

In (5a) and (5b) of Table I (cf. (69) below) the two types of low tone adjectives behave identically, as they do after noun stems of type (3), i.e. they undergo ASSIMILATION.

(69) a) (5a) bènd sîngô /#bèn-dN+sôm-gô#/ 'a good
   L H H₁ drum'

   b) (5b) bènd kûdrê /#bèn-dN+sôm-gô#/ 'an old
   L H H₁ drum'

Yet in the surface there doesn't appear to be any high tone that causes the assimilation of the adjective stem, the surface pattern for this type of adjective phrase being L+H H₁.
Again, this is explained by the analysis of complex nouns proposed above (cf. section 3.8(31)). Thus the high tone needed to trigger the application of ASSIMILATION to the low tone of the adjective stem is provided by the POLAR TONE
rule, which applies to the suffix in the noun stem (cf. the derivation in (36b)). (For some derivations of adjective phrases, cf. (75) below.)

There is one additional fact, however, which is not accounted for. If in type (4) nouns the final low of the complex stem remains and blocks assimilation, then the following high in (4b), (4c), and (4d) of Table I should be non-automatic downstep, e.g. *H+H₁-H₁, *H+H₁-L, and *H+H₁-H₂ respectively. The fact that this is not the case leads us to propose a rule which deletes suffix final low tone before DOWNSTEP (6) occurs. Such a rule is justified on independent ground, since in final position, a low tone suffix vowel may be optionally deleted but a high tone vowel may not, e.g.

(70) a) ˈm gé₇a págᵃ/*pág' 'I saw a woman.'
   b) ˈm gé₇a náᵃf⁼/*náaf' 'I saw a cow.'
   c) ˈm gé₇a sáⁿaᵃ/sáan' 'I saw a stranger.'

In (70a and b) the starred forms show that it is not possible to delete a final high tone vowel; (70c) indicates that low tone vowels may be deleted. As the examples in (71) show, a following high tone does not become downstep after a deleted low. Thus the high tone indefinite negative particle vá which appears at the end of a negative phrase is not affected by the preceding deleted low tone suffix of némdə (‘meat’) in (71a), but vá becomes non-automatic downstep after an assimilated low tone verb wə 'come' in (71b); nor is the high tone of the direct object némdə (‘meat’)
affected by the deleted low of the indirect object sáanà ('stranger') in (71c).

(71) a) `m ká dyg nemd ye. 'I haven't cooked meat.'
L H₁ H₁ H₁ H₁
b) `a ká wa ye. 'He hasn't come.'
L H₁ H₁ H₂

c) `m kó ó sáan nemd(ó). 'I gave a stranger
L H₁ H₂ H₁ H₁ H₂ H₃ H₃ (L) some meat.'

With one exception, to be noted below in the section on possessives, non-automatic downstep in Moore never results from loss of a low tone strictly through deletion, i.e. almost all cases of non-automatic downstep result from assimilation of a low tone to a preceding high.

I shall propose the rule in (72) to account for the above facts:

(72) Suffix final LOW tone Vowel DEletion:

\[
\left[ -H \right] \rightarrow \emptyset \ / \ -(C) \quad [+\text{BOUND}] \ X
\]

if \( X = \emptyset \), LOW-V-DEL is optional

The condition on (72) deals with cases like (70c), where deletion of final low tone suffix vowel is optional in final position. LOWVDEL applies after ASSIMILATION and RAISING but before DOWNSTEP.

Finally, the adjective phrases in Table I provide evidence for ordering RAISING before DOWNSTEP and therefore indirectly for the ordering of ASSIMILATION before DOWNSTEP, since as we have seen above (i.e. cf. the comments following (67)), ASSIMILATION must precede RAISING. (POLAR TONE must
precede ASSIMILATION because in some cases it provides the high tone which triggers ASSIMILATION, cf. the derivation in (74d) below.) Note that wherever RAISING applies to the final adjective in an adjective phrase, the downstep level of the highs of the adjective is the same throughout the adjective (e.g. (1b), (2b), (4b), (6b), (8b), (10b) of Table I). If DOWNSTEP were to precede RAISING, then we would expect (1b) and (2b) to have the form of (1a) and (2a) prior to the application of RAISING, i.e. L+L-H₁. Therefore, in the case of (1b) and (2b), RAISING would have to raise the lows of the adjective stem to the downstep pitch level of the following suffix, i.e. L+L-H₁ → L+H₁-H₁. But such a rule would produce an incorrect output in the case of (4b), which, prior to RAISING, would have the form of (4a), i.e. H+L-H₁ → *H+H₁-H₁. Thus there would have to be a separate rule to produce the correct form for (4b), H+H-H, and (10b), H+H+H-H. By ordering RAISING before DOWNSTEP, all stem raising can be accomplished in one simple rule as stated in (28). As noted above in Section 3.3 (cf. note 10), this ordering is in support of what Schachter and Fromkin (1968) found in Twi, though the arguments are not the same.

Below in (73) is a summary statement of the ordering of the rules so far presented. (The ordering of (1) before (2) is not crucial and is done so that all the tone changing rules may appear together.)
1) Suffix Vowel ELISION (35)

2) POLAR TONE in inflectional suffixes (34)

3) Tonal ASSIMILATION (36)

4) Stem RAISING in nouns and adjectives (28)

5) Suffix final LOW tone Vowel DEletion (72)

6) DOWNSTEP pitch assignment (6)

7) [SEGMENT] DEletion (37)

Before providing derivations for adjective phrase it
will be necessary to expand ASSIMILATION, since as stated
in (36), it applies only over suffix boundary (-). When it
operates on elements in an adjective phrase or compound (cf.
section 3.19), the high tone which triggers the assimilation
is separated from the following sequence of lows by a root
boundary. Therefore we must add (74a) and (74b) to ASSIMI-
LATION as stated in (36a) and (36b) (the amalgamation of
(36) and (74) is stated in (77)):

(74) Tonal assimilation within adjective phrase:

a) $\emptyset \rightarrow \left[ -H \right]_{-SEG}/[+H] + \left[ [-H]_{0} \right]_{1}[+H]X$

b) $([-H] \rightarrow [+H]/[+H] + \left[ [+AB]_{0} \right]_{1}[-H](#)(+[H])X$

The derivations in (75) below for adjective phrases
with surface tone patterns of the types represented in
slots (1b), (3b), and (5b) illustrate the operation of these
rules. I have chosen patterns from column (b) because the
combinations in this column best show the interplay of the
rules so far presented. (For the sake of brevity, I have not included Vowel EPENTHESIS in the derivations.)

(75) a) (1b)

\[ \text{'an old box'} \]
\[ \text{tug} + \text{kýd} - r e \]
\[ \text{HHLLLLL} \]
\[ \text{H POLAR TONE (34)} \]
\[ \text{HHHH} \]
\[ \text{RAISING (28)} \]
\[ \text{H1H1H1H1} \]
\[ \text{DOWNSTEP (6)} \]
\[ \phi \phi \phi \phi \phi [-SEG] DEL (37) \]
\[ \text{LLH1H1H1H1} \]
\[ \text{tug kýdre} \]
\[ \text{LH1H1} \]

b) (3b)

\[ \text{'an old stone'} \]
\[ \text{kug} + \text{kýd} - r e \]
\[ \text{HHLLLH} \]
\[ \text{H POLAR TONE (34)} \]
\[ \text{(L) ASSIMILATION (74a)} \]
\[ \text{HHHH} \]
\[ \text{ASSIMILATION (74b)} \]
\[ \text{H1} \]
\[ \text{DOWNSTEP (6)} \]
\[ \phi \phi \phi \phi \phi [-SEG] DEL (37) \]
\[ \text{HHHHHHH1} \]
\[ \text{kug kýdre} \]
\[ \text{H1H1} \]
c) (4b)

# ben- g V + k y d - r e #  
HHH L L LLL L L  

(L) V ELISION (35)
H POLAR TONE (34)
H ASSIMILATION (36b)
HHH H RAISING (28)
\emptyset LOW V DEL (72)
\emptyset [-SEG] DEL (37)
\emptyset \emptyset \emptyset \emptyset \emptyset \emptyset 
HHH H HHH HHH b en g k y d r e 
H H H

d) (5b)

# ben- d V + k y d - r e #  
LLL L L LLL L L  

(H) V ELISION (35)
(H) POLAR TONE (34)
(L) ASSIMILATION (74a)
HHH H ASSIMILATION (74b)
(H1) H1H1H1 H1 H2 DOWNSTEP (6)
\emptyset \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset [-SEG] DEL (37)
LLL L L H1H1H1 H1 H2 b en g k y d r e 
L H1 H2
Finally, we must add one more expansion of ASSIMILATION to account for the pattern in (8b) of Table I as represented by the derivation in (75e) where the assimilation process applies over the '+' which follows kug ('stone') to the sequence of low tones in the root ke ('green') but not over the '+' which follows ke. Yet in the surface the sequence of highs on kud created by RAISING is non-automatic downstep. This means that when ASSIMILATION applies to a sequence of lows which contains no suffix boundaries (i.e. when it is a root), the first part of ASSIMILATION inserts a [-SEG] low tone before the final '+' which bounds the sequence on the right. (76) accomplishes this.

\[(76) \emptyset \rightarrow \left[ -H \right] / [+H] + [-H]_{1} + X\]

By the use of the rule conventions mentioned in section 1.5, (36a), (74a), and (76) can be collapsed into the rule
in (77a), and (36b) and (74b) can be collapsed into (77b):

(77) Tonal ASSIMILATION within words and adjective phrases:

a) $\emptyset \rightarrow \left[ \begin{array}{c}
-H \\
\text{-SEG}
\end{array} \right] \\ [+H](+) \left[ \begin{array}{c}
-H \\
\prec [+AB] \preceq
\end{array} \right] \prec \leftrightarrow ( [+H] ) \ X$

b) $[-H] \rightarrow [+H]/[+H](+)$

$ \left[ \begin{array}{c}
\prec [+AB] \preceq \\
[+AB] \preceq
\end{array} \right] \ X$

In section 3.22, (77) will be expanded to include tonal assimilation over word boundary (#) and eventually, in the final list of rules in section 3.36, both the (a) and the (b) parts of ASSIMILATION will be combined in a single statement by the convention of conjunctive ordering.

3.19 Compound Forms

There are many nouns in Mooré which on the surface appear to be polysyllabic but which on closer scrutiny can be analyzed as compound forms, i.e. N+A or N+N. (78) shows the possible tone patterns of nouns with 'disyllabic' roots.

(78) a) kuldeoogó, kuldeedó 'A type of fresh water fish'
\[
L \ H \ H_1
\]

b) násara, násárba 'European; white man'
\[
L \ H_1 H_1
\]

c) kúkúrí, kúkúyá 'hoe handle'
\[
L \ H_1 L
\]

d) bôyáangá, bôyáamsé 'old female donkey'
\[
L \ H_1 H_2
\]

e) bôyêega, bôyêesé 'lion'
\[
H \ H \ H_1
\]

f) sompiiga, sompiisè 'animal fodder'
\[
H \ H \ L
\]

g) kámaandé, kámaaná 'corn'
\[
H \ H \ H_1 H_1 H_1 L
\]

---

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h) búlvāka, búlvāgse 'a spice'
    H H H

i) kù(r)kùrí, kù(r)kùyá 'pig'
    L H₁ H₂

The following patterns are non-existent: *LL-L, *HL-L, *HL-H. If we compare the forms in (78) to the surface patterns in Table I, we see that all of the above mentioned patterns and none of the non-existent forms are found there. (Compare (78a) with (1a) and (2a); (78b) with (1b) and (2b); (78c) with (1c) and (2c); (78d) with (1d) and (2d); (78e) with (3a) and (3b); (78f) with (3c) and (4c); (78g) with (3d); (78h) with (4b); (78i) with (5a) and (5b).)

One difficulty is that if (78h) is composed of a type (4) noun plus a type (b) adjective, then we should expect the first syllable of the word to be CVCC- or CVC-. I can't explain this other than to hypothesize that an underlying suffix has been deleted. A point in favor of analyzing (78h) like 4b of Table I is that when modified by an adjective its second syllable (and only its second syllable) becomes low:

(79) búlvāka; sòngó = búlvāg sòngó *búlvāg sòngó
    H H H L H₁ H L L H₁ H H L H₁

'spice' 'good' 'a good spice'

The above analysis of surface 'disyllabics' also explains an otherwise strange fact: that the -V suffix in the plural of (78i) is non-automatic downstep.³⁹ As noted above (cf. examples (31c), (32b, c, and d) and following comments), -V suffixes never carry non-automatic downstep.
when affixed to high tone 'monosyllabic' stems, though -CV suffixes do, if the stem is complex. In claiming that the underlying structure of (78i) after POLAR TONE is L-H+L-H which becomes surface L+H-H₁ (cf. (5a) and (5b) of Table I) we can explain the downstep high in the plural of (78i) by saying that it comes about as a result of application of ASSIMILATION to the underlying low of the second syllable. One further point which supports the view that (78i) has the above proposed systematic phonemic tone pattern is that when modified by a low-high adjective, the low of the adjective does not undergo assimilation as indicated in (80).

\[(80)\]  \( \text{ku(r)kurí; sòngó = ku(r)ku sòngó *ku(r)ku sòngó} \)
\[L \quad H_1 \quad L \quad H_2 \quad L \quad H_1 \quad H_1 \quad H_2 \]

'pig' 'good' 'a good pig'

3.20 Possessive Constructions

Possessive constructions in Moore are formed by placing the possessed noun after the possessing noun. I shall assume that in deep structure possessives originate from a relative clause construction and are reduced to the surface structure in (81):

\[(81)\]

```
[ # [ N NUM] D [ # [ N NUM] D # ] # ]
NP NOM NP NOM NP NOM NP
```

Note that both nouns retain their suffixes, but the suffix vowel of the first noun elides according to the principle
established in (35) (V ELISION), e.g.

(82)  `naabá doógo = `naab doógo
       \L 1 \L 1     \L (H1) H1 H2

   `chief''house'   'a chief's house'

If the first noun is definitized (cf. section 3.17) the final non-automatic downstep and the nasalization on the vowel of the definitizer are elided:

(83)  a) `naabá (/#nə-bV-ə-wa#/) doógo =

       `the chief''house'

       `naabá doógo [naabá doógo]
       \L \L (H2) H2 H3

       'the chief's house'

b) saánà (/#sə-nV-ə-wa#/) doógo =

       `the stranger''house'

       saánà doógo [saánà doógo]
       \H \L(H1) H1 H2

       'the stranger's wife'

In some cases the elision of the final tone and the nasalization of the definitizer makes the definite identical with the indefinite, e.g. when the noun carries a suffix ending in a, i.e. -ba, -a, -ga. There is never any confusion on the part of speakers, however, because the mere presence of a vowel means that it is the definitizer, since suffix vowels in non-utterance final position automatically elide.

In the case of H-L nouns (e.g. (83b)) above: saánà

'stranger'), the elision of the final tone of the definite leaves a low tone. In writing these forms I shall always spell the definitizer with nasalization but I shall not

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write the elided final tone. The elided suffix vowel of the indefinite is never written (cf. น้าบ for น้าบá in (82)).

Table II illustrates the surface tone patterns for possessive constructions. The column of nouns (1) through (5) on the left are the possessing nouns and represent the same five types of nouns as appear in (1) to (5) Table I; the row (a) through (c) at the top are the possessed nouns and are the same tone types as (a) through (d) in Table I. Each numbered slot on the left is divided into two sections, I for indefinite and D for definite. For each noun the following is provided: 1) an English gloss; 2) the surface form of the noun in isolation; 3) a schema of letters H and L indicating the surface tone pattern of the noun in isolation. (I have not listed the systematic phonemic forms.) The combinations of H and L in the spaces of the Table indicate the surface tone patterns which result from combining the possessing nouns on the left with the possessed nouns at the top, the former always being represented by the pattern to the left of '#' and the latter by the pattern to the right of '#'. The letters in parentheses are tones which are elided and which do not appear in the surface pronunciation.
<table>
<thead>
<tr>
<th>Possessed Noun</th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>'house' 'woman'</td>
<td>'stone'</td>
<td>'cow'</td>
<td></td>
</tr>
<tr>
<td>dōgō pága</td>
<td>kúgrí</td>
<td>náafo</td>
<td></td>
</tr>
<tr>
<td>Possessing Noun</td>
<td>L–H₁</td>
<td>H–L</td>
<td>H–H₁</td>
</tr>
<tr>
<td>1) I 'chief' nāabá</td>
<td>L–H₁</td>
<td>L(–H₁)#H₁–H₂</td>
<td>L(–H₁)#H₁–L</td>
</tr>
<tr>
<td></td>
<td>L–H₂</td>
<td>L(H₁(H₂))#H₂–H₃</td>
<td>L(H₁(H₂))#H₂–L</td>
</tr>
<tr>
<td>2) I 'man' dáwa</td>
<td>H–H</td>
<td>H(–H)#H–H₁</td>
<td>H(–H)#H–L</td>
</tr>
<tr>
<td></td>
<td>H–H₁</td>
<td>H–H(H₁)#H₁–L</td>
<td>H–H(H₁)#H₁–H₂</td>
</tr>
<tr>
<td>3) I 'Dogon' kíbgà</td>
<td>H–L</td>
<td>H(–L)#L–H₁</td>
<td>H(–L)#H₁–H₂</td>
</tr>
<tr>
<td></td>
<td>H–H₁</td>
<td>H–L(H₁)#H₁–L</td>
<td>H–L(H₁)#H₁–H₂</td>
</tr>
<tr>
<td>4) I 'strangers' sáamba</td>
<td>H–H₁</td>
<td>H(–H₁)#H₁–H₂</td>
<td>H(–H₁)#H₁–L</td>
</tr>
<tr>
<td></td>
<td>H–H₂</td>
<td>H(H₁(H₂))#H₂–H₃</td>
<td>H(H₁(H₂))#H₂–L</td>
</tr>
<tr>
<td>5) I 'thief' wàgdré</td>
<td>L–H₁</td>
<td>L(H₁(L))#H₂–H₃</td>
<td>L(H₁(L))#H₂–H₃</td>
</tr>
<tr>
<td></td>
<td>L–H₁</td>
<td>L(H₁(L))#H₂–H₃</td>
<td>L(H₁(L))#H₂–L</td>
</tr>
</tbody>
</table>
First, note that [−RAISING] and [+RAISING] nouns behave the same throughout when occurring in second position and thus only one column, (a), is needed to represent both, e.g. compare (84) below with (82), both of which are represented by (1.I.a) of Table II.

\[
(84) \text{`naabá, pága} = \text{`naab pága} [\text{`naab pága}] \\
\text{L (H1) H1 H2}
\]

'chief', 'woman; wife' 'a chief's wife'

For those combinations where the first noun ends in a high tone (e.g. (82) and (84)), this merging of the two types of low tone noun is to be expected, since the systematic phonemic low of the second noun undergoes ASSIMILATION, which means that RAISING will not apply. But on analogy to the adjective phrases in Table I, one would expect that a difference between the two types of low noun would show up in (3.I.a) (cf. (85a) and (85b) below) and (5.I.a) of Table II where the initial word ends in low tone and therefore ASSIMILATION does not apply. (In Table I, compare (1a) with (1b) and (2a) with (2b); and then (3a) with (3b).) But, as shown in (85b), for some reason which I do not at present understand, RAISING does not apply to the second of two nouns in a possessive construction:

\[
(85) \text{a) kíbgá, dogbó} = \text{kíbg, dogbó} \\
\text{H (L) L H1}
\]

'Dogon' 'house' 'a Dogon's house'

b) kíbgá, pága = kíbg pága (*kíbg págá) \\
\text{H (L) L H1 H H H}

'Dogon' 'wife' 'a Dogon's wife'
In order to account for this as well as the cases where RAISING does apply to the second noun in a possessive construction (cf. section 3.21 (90b) (91b)), it is necessary to add a condition to RAISING. This condition is given in the final version in the list of rules in section 3.36 (Rule 9).

A second point of interest to be noted in Table II is the non-automatic downstep after the elided low tone in (3.I.b), (3.I.c), (5.I.b), and (5.I.c).

\[
(86) \text{kíbgá, kúgri} = \text{kíbg kúgri} \quad [\text{kíbg kúgri}]
\]
\[
\text{H (L) H₁ L}
\]

'Dogon' 'stone' 'a Dogon's stone'

\[
*\text{kíbg kúgri}
\]
\[
\text{H (L) H L}
\]

As noted above in section 3.18, in conjunction with examples (70) and (71), it is only in possessive constructions that an elided low tone causes a following high tone to become a non-automatic downstep. Thus there is need for a condition on the suffix final LOW tone Vowel DEletion rule as stated in (72) which prohibits its operation in possessive constructions; this condition appears in the final version of (72) given in the list of rules in section 3.36. (Of course the final vowel of kíbgá in (86) will still undergo V ELISION (35), and then it will be deleted by [-SEG] DEletion (37) after DOWNSTEP.

3.21 Possessive Pronouns

Personal pronouns in Moore have two basic forms: a 'long' and a 'short' form. The long form is roughly
equivalent in usage to a stressed pronoun in English or a disjunctive pronoun in French and the short form to an un-stressed pronoun.

(87) Personal Pronouns

<table>
<thead>
<tr>
<th>Long</th>
<th>Short</th>
<th>Non-final position</th>
<th>Final position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singular</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) /màː-m/</td>
<td>màː</td>
<td>m [m]</td>
<td>ma [ma]</td>
</tr>
<tr>
<td>2) /fò-ó/</td>
<td>fò/</td>
<td>f [f]</td>
<td>fo [fo]</td>
</tr>
<tr>
<td>3) /yé`/</td>
<td>yé`</td>
<td>a [a]</td>
<td>a [a]</td>
</tr>
<tr>
<td>Plural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) /tôn-dɔ/</td>
<td>tôndɔ</td>
<td>d [d]</td>
<td>do [do]</td>
</tr>
<tr>
<td>2) /y˚m-bə/</td>
<td>y˚mbə</td>
<td>y [i]</td>
<td>y˚ [y˚]</td>
</tr>
<tr>
<td>3) /b˚m-bə/</td>
<td>b˚mba</td>
<td>b [b]</td>
<td>ba [ba]</td>
</tr>
</tbody>
</table>

In the case of the long form pronouns, the final vowel of the 2nd singular and the 1st, 2nd, and 3rd plural is elided (by V ELISION (35)) when followed by another element; also the final high tone on the m of the 1st singular is elided when in non-final position; in the systematic phonemic form of the 3rd singular long form I have postulated a final low tone because in all cases it patterns with those long form pronouns which end in low tone (e.g. cf. Table III, row 2). In the case of the short form pronouns, when they occur in utterance final position they may optionally have the form given in the rightmost column of (87); otherwise they have the form given in the column second from the right. (For remarks on this latter form cf. section 2.2 (12) and for comments on the tone of the former cf. section 3.27.)
Table III indicates the surface tone patterns for possessive constructions containing a pronoun as the first word and a noun as the second (i.e. possessed) word. It reads like Tables I and II where the slots represent the surface patterns resulting from the combination of the pronoun types (1) to (4) in the column on the left with the noun types (a) to (d) in the row along the top. The pronouns are divided into classes according to the behavior of a following word in a possessive construction. Tones in parentheses in the surface patterns indicate elision.

(See Table III on page 103)

As noted in the preceding section, [-RAISING] and [+RAISING] low tone nouns (i.e. types (a) and (b) respectively of Table III) are never differentiated in the surface when occurring as the second noun in a noun plus noun possessive construction. But in the case of possessive constructions where the first element is a pronoun, this merging of noun types (a) and (b) occurs only after pronoun type (2), where neither ASSIMILATION nor RAISING applies to either type (cf. (88a) and (88b)), and after pronoun type (3), where ASSIMILATION applies to both types (cf. (89a) and (89b)).

(88) a) (Table III, 2a) tõnd  doôgo  'our house'
    H (L) L H₁

 b) (Table III, 2b) tõnd  pagbá  'our wives'
    H (L) L H₁
Table III: Possessive Pronouns

<table>
<thead>
<tr>
<th>Possessed Noun</th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
<th>(d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>'house'</td>
<td>L-H</td>
<td>H-H</td>
<td>H-L</td>
<td>H-H&lt;sub&gt;1&lt;/sub&gt;</td>
</tr>
<tr>
<td>doogó</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pagba</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kugri</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>náafó</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pronouns</th>
<th>L-H&lt;sub&gt;1&lt;/sub&gt;</th>
<th>L(-H&lt;sub&gt;1&lt;/sub&gt;)#H&lt;sub&gt;1&lt;/sub&gt;-H&lt;sub&gt;2&lt;/sub&gt;</th>
<th>L(-H&lt;sub&gt;1&lt;/sub&gt;)#H&lt;sub&gt;1&lt;/sub&gt;-H&lt;sub&gt;1&lt;/sub&gt;</th>
<th>L(-H&lt;sub&gt;1&lt;/sub&gt;)#H&lt;sub&gt;1&lt;/sub&gt;-L</th>
<th>L(-H&lt;sub&gt;1&lt;/sub&gt;)#H&lt;sub&gt;1&lt;/sub&gt;-H&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) mam</td>
<td></td>
<td>L-H&lt;sub&gt;1&lt;/sub&gt;</td>
<td>L(-H&lt;sub&gt;1&lt;/sub&gt;)#H&lt;sub&gt;1&lt;/sub&gt;-H&lt;sub&gt;2&lt;/sub&gt;</td>
<td>L(-H&lt;sub&gt;1&lt;/sub&gt;)#H&lt;sub&gt;1&lt;/sub&gt;-H&lt;sub&gt;1&lt;/sub&gt;</td>
<td>L(-H&lt;sub&gt;1&lt;/sub&gt;)#H&lt;sub&gt;1&lt;/sub&gt;-L</td>
</tr>
<tr>
<td>foo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) tóndó</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yámbá</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>y'è&lt;sup&gt;(r)&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) bamba</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) m, f, a, L</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d, y, b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(89) a) (Table III, 3a) b’amb doogó ‘their house’
   \[ H (H) H \ H_1 \]

b) (Table III, 3b) b’amb pagba ‘their wives’
   \[ H (H) H \ H_1 \]

However, after type (1) and type (4) pronouns, the two types of low tone nouns are differentiated in the surface. In the former case, ASSIMILATION applies to type (a) (cf. (90a)) but not to type (b) and then RAISING subsequently applies to type (b) (cf. (90b)); in the case of type (4) pronouns (i.e. all short form pronouns), ASSIMILATION applies to neither type (a) or type (b) which is to be expected because there is no preceding high tone, but then RAISING applies to type (b) (cf. (91a) and (91b)).

(90) a) (Table III, 1a) m’am doogó ‘my house’
   \[ L (H) H_1 \ H_1 H_2 \]

b) (Table III, 1b) m’am pagba ‘my wives’
   \[ L (H) H_1 \ H_1 \]
   \[ *m’am pagba \]
   \[ L (H) H_1 \ H_2 \]

(91) a) (Table III, 4a) \‘m doogó ‘my house’
   \[ L L H_1 \]

b) (Table III, 4b) \‘m pagba ‘my wives’
   \[ L \ H_1 \ H_1 \]
   \[ *\‘m pagba \]
   \[ L L H_1 \]

At present I have no explanation as to why ASSIMILATION applies in (90a) and not in (90b), where we would expect the asterisked form, and why RAISING applies in (91b), where on analogy with (85b) (cf. Table II, 3.I.a) and (88b) (cf. Table III, 2b) we would expect the asterisked
form, but not in (88b). The incorrect asterisked forms of (90b) and (91b) would have to be prevented from occurring by admittedly ad hoc conditions on ASSIMILATION and RAISING, which I shall not bother to formulate in this work.

3.22 Tonal Assimilation over Word Boundary (#)

The preceding sections have demonstrated that the principle of assimilation of a sequence of low tones to a preceding high tone operates at all levels of the sentence: within complex nouns and adjectives, where it operates over suffix boundary (-) (cf. section 3.8 (36)); within adjective phrases, where it operates over root boundary (+) (cf. section 3.18 (74)); and within possessive constructions where it operates over word boundary (#) (cf. section 3.20). The statement of ASSIMILATION presented in (77), however, is designed to handle only the first two. Therefore we must now reformulate (77) to accommodate tonal assimilation that operates over "#". But there are some additional facts which must be presented before stating the revision of ASSIMILATION.

First, when ASSIMILATION operates over word boundary, there is a restriction in that the high tone which triggers the assimilation must be an elided high tone. This can be seen when a low tone word which normally undergoes assimilation is preceded by a non-elided high tone such as occurs in the plural of a small class of complex nouns belonging to the -re/-a class. These nouns are exceptions to the

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In the (a) and (b) sentences of (92), (93), and (94) below compare the surface behavior of the systematic phonemic low tone of the words doogó ('house') (92), wàtá (imperfective of 'come') (93), and zaamé ('yesterday') (94), where the initial low tone assimilates to the elided final high of abga ('panther') in the (a) sentences but not to the unelided high of wàgda ('thieves') in the (b) sentences.

(92) a) `abg doogó 'a panther's lair'
    L (H₁) H₁ H₂
    b) wàgda doogó 'some thieves' house'
    L H₁ L H₂

(93) a) `abg wàtá mé 'a panther is coming.'
    L (H₁) H₁ H₂ H₃
    b) wàgda wàtá mé. 'Some thieves are coming.'
    L H₁ L H₂ H₃

(94) a) `m yàa `abg zaamé. 'I saw a panther yesterday.'
    L H₁ H₂ (H₃) H₃ H₄
    b) `m yàa wàgda zaamé. 'I saw some thieves yesterday.'
    L H₁ H₂ H₃ L H₄

(For an explanation of the raising of the initial tones of abga and wàgda in (94) cf. section 3.29.)

Therefore, when ASSIMILATION applies over '#', it must be restricted to cases where the high tone which triggers it is elided. Note that in adjective phrases where the intervening boundary is '+', the high tone need not necessarily be elided, cf. the derivation in (75b). Below in (95) is a statement of ASSIMILATION over word boundary:
(95) ASSIMILATION over word boundary (#)

a) \( \emptyset \rightarrow [-H] [\neg \text{SEG}] [+H] \# [\neg \text{SEG}] [+AB]_1 [-H] X \)

b) \( [-H] \rightarrow [+H] [\neg \text{SEG}] [\neg \text{SEG}] [+AB]_1 [-H] X \)

The second fact concerns simple particle morphemes such as \( \text{tà} \), the past tense marker, \( \text{sà} \), the relative clause marker, and others. In the surface structure these particles are bounded on each side by '#'. In (96a) and (96b) below, \( \text{tà} \) does not undergo ASSIMILATION because it is preceded by a low tone, i.e. the elided low of \( \text{tôndà} \); (96c) shows that when \( \text{tà} \) undergoes ASSIMILATION (i.e. it is preceded by the elided final high of \( \text{bàmbà} \)), the assimilatory process does not extend past the last segment of \( \text{tà} \); and (96d) shows that when \( \text{tà} \) undergoes ASSIMILATION, a following high tone carries non-automatic downstep.

(96) a) \( \text{tônd } \text{tà } \text{wàtà } \text{mé. } /\#\text{tônd }\text{dà}#\text{wà }\text{dà }\text{à}+\text{mé}/ \)

\[ \begin{array}{c|c|c|c|c}
   & H & L & H_1 & H_2 \\
\hline
\end{array} \]

We were coming.

b) \( \text{tônd } \text{dà } \text{sòsdà } \text{mé. } /\#\text{tônd }\text{dà}#\text{sòs }\text{dà }\text{à}+\text{mé}/ \)

\[ \begin{array}{c|c|c|c|c}
   & H & L & H_1 & L & H_2 \\
\hline
\end{array} \]

We were conversing.

c) \( \text{bàmb } \text{dà } \text{wàtà } \text{mé. } /\#\text{bàmb }\text{bà}#\text{wà }\text{dà }\text{à}+\text{mé}/ \)

\[ \begin{array}{c|c|c|c|c}
   & H & L & H_1 & H_2 \\
\hline
\end{array} \]

They were coming.

d) \( \text{bàmb } \text{dà } \text{sòsdà } \text{mé. } /\#\text{bàmb }\text{bà}#\text{sòs }\text{dà }\text{à}+\text{mé}/ \)

\[ \begin{array}{c|c|c|c|c}
   & H & H & H_1 & L & H_2 \\
\hline
\end{array} \]

They were conversing.
(For an explanation of the irregular form of the imperfective of \( \text{wā} \), cf. section 2.5, note 3; for an explanation of the elements following the verb, cf. section 3.23.)

This is like the situation described for simple roots in conjunction with the derivation in section 3.18 (75e), where it was necessary to propose (76) as an expansion of the first part of ASSIMILATION in which a [-SEG] low tone is inserted before the rightmost '+' of a simple root. (97) is a very similar expansion which inserts [-SEG] low tone before the rightmost '#' which bounds a simple particle.

(97) Insertion of low tone in assimilation of particles bounded by '#'

\[ \emptyset \rightarrow [\hspace{0.5cm} [-H \quad +H \quad \# -H] \hspace{0.5cm} l \hspace{0.5cm} \# \hspace{0.5cm} X \hspace{0.5cm} ] \]

By the use of the abreviatory rule conventions mentioned in section 1.5, (95a) and (97) can be combined with (77a) and stated as (98a); and (95b) can be combined with (77b) and stated as (98b):

(98) Tonal ASSIMILATION:

\[ \begin{align*}
\text{a)} \quad & \emptyset \rightarrow [\hspace{0.5cm} [-H \quad +H \quad \left< \begin{array}{c}
\text{BOUND} \\
\text{βWB} \\
-\text{AB}
\end{array} \right> \right]_{\text{1}} \hspace{0.5cm} [\hspace{0.5cm} [-H \quad \left< \begin{array}{c}
\text{+AB} \\
\text{ββ} \\
-\text{AB}
\end{array} \right> \right]_{\text{3}} \hspace{0.5cm} [\hspace{0.5cm} +H \hspace{0.5cm} ]_{\text{4}} \hspace{0.5cm} X \\
\text{b)} \quad & [-H] \rightarrow [\hspace{0.5cm} +H \quad \left< \begin{array}{c}
\text{BOUND} \\
\text{βWB} \\
-\text{AB}
\end{array} \right> \right]_{\text{1}} \hspace{0.5cm} [\hspace{0.5cm} +H \hspace{0.5cm} ]_{\text{4}} \hspace{0.5cm} X
\end{align*} \]

conditions:

1) if \( \beta = +, \alpha = - \)
The condition on (98) assures that just in case a word boundary (#) separates the sequence of lows from the preceding high tone in the environment, the high tone must be elided, i.e. [-SEG]. The angled brackets under 3 and 4 of (98a) state that 4 may be root boundary (+) or word boundary (#) only if the sequence under 3 contains no suffix boundary (-), but where this is not the case, e.g. where 3 contains '-' and 4 is '#' as in (38a), (98a) does not operate.

Finally, it is necessary to add another condition to (98) in order to account for one more fact: when there is a sequence of two nouns which are nowhere dominated by the same NP in the same sentence, e.g. an indirect object followed by a direct object (where the surface structure would have two separate NP's dominated by VP), ASSIMILATION applies to the second noun only if it is a [-RAISING] low tone noun (cf. (99a)); if it is a [+RAISING] low noun, ASSIMILATION does not apply and RAISING does apply (cf. (99b)). But in possessive constructions (where the two nouns are indirectly dominated by the same NP, cf. section 3.20 (81)), both types of low tone nouns undergo ASSIMILATION (cf. 100). In comparing (99) and (100) below, we see that the [-RAISING] noun wefό ('horse') and the [+RAISING] noun wamde ('calabash'), which follow dava ('man') in all the examples, have the same surface form in (100) and different surface forms in (99).
(99) a) \[ m \, k\, o\, o\, daw \, weefo \]
\[ L \, H^1 H_2 \, H^3(H_3) \, H^3 \, H_4 \]
I gave a man a horse.

b) \[ m \, k\, o\, o\, daw \, wamde \, (*wamde) \]
\[ L \, H^1 H_2 \, H^3(H_3) \, H^3 \, H_3 \, H_4 \]
I gave a man a calabash.

(100) a) \[ m \, y\, a\, daw \, weefo \]
\[ L \, H^1 \, H_2(H_2) \, H^3 \, H_3 \]
I saw a man's horse.

b) \[ m \, y\, a\, daw \, wamde \, (*wamde) \]
\[ L \, H^1 \, H_2(H_2) \, H^3 \, H^3 \, H_2 \, H_2 \]
I saw a man's calabash.

Therefore ASSIMILATION must be blocked in the case of (99b),
but not in (99a) and (100a) and (100b). The condition on
(98) stated in (101) accomplishes this:

(101) Condition on ASSIMILATION (98):
if 2 = # and 3 = [+RAISING], 1 and 3 are
indirectly dominated by the same NP.

Note that the expansion of ASSIMILATION in (98) will
also account for the behavior of the low tone prefix a-
which occurs with personal names. For example, the name
`Ayambá 'Yamba' has the form /#a+yambá-ba#/ after application
of the boundary reduction convention in section 1.6 (a).
When ASSIMILATION applies it raises only the tone of the
prefix and does not extend over into the main stem of the
word. This can be seen in the following sentence where, as
will be shown in section 3.29, the initial sequence of lows
of the complement NP assimilates to the preceding elided

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high tone declarative marker me: ˈm yaa áYamba 'I saw Yamba'; we do not get [áYamba]. In the case of a proper name where a high tone follows a-, the high becomes a non-automatic downstep, e.g. əKúlga 'Kulga'; ˈm yaa áKúlga [ákúlyá] 'I saw Kulga'.

In the version of ASSIMILATION stated in (98), large parts of the environments of the (a) and (b) parts are identical. This will enable us to combine the two into one statement in section 3.36 by the principles of conjunctive ordering. But before this, there is one additional fact which ASSIMILATION must be made to account for which is discussed in section 3.33.

3.23 The Verbal Group

In the following sections I shall show how the tonal principles discovered in the preceding sections can be applied to the analysis of certain elements which are phonologically in close association with the main verb. Among these elements are two post verbal particles, a~la and me, for which previous descriptions of Moore have provided confused or at best incomplete accounts. Only through an understanding of the tone system can one arrive at a coherent description of these morphemes and the important role that they play in the syntax of Moore. This is due to the fact that under certain conditions these morphemes elide and their presence is indicated in the surface only by the tonal behavior of the following word. A proper tonal analysis of
the elements in the verbal group will enable us to identify the perfective morpheme, which is also subject to elision, and to structurally define 'subjunctive' in Moore'.

The following elements may appear in the verbal group (Vb): 1) Verb (V); 2) Aspect (ASP), which is either imperfective (I) or perfective (P); 3) the verbal particle /+e/; 4) short form pronoun objects (Pro); 5) the complement marker, -a-1a; 6) the post verbal declarative particle, /+me/. I shall assume the following phrase structure expansion for Vb, which is dominated by VP:

(102) \[ \text{VP} \rightarrow X \text{ Vb Y} \]
\[ \text{Vb} \rightarrow V \text{ (ASP) (e')} \]
\[ \text{ASP} \rightarrow \{I\} \]
\[ \{P\} \]

Pro, a-1a, and me are inserted into Vb by transformation. Phonologically the entire Vb behaves like a single word and so I shall consider that it is bounded on each side by word boundary (#). The surface structure of Vb after application of the boundary reduction conventions is that shown in (103):

(103) \[ \#V(-\{I\})(+e)(-Pro)(-1a)(+me)# \]
\[ \text{Vb} \]

In the sections that follow I shall demonstrate that the tone of certain of these elements varies according to the tone of the verb which heads Vb. With respect to surface tone differences in the elements of Vb, the verbs which bring about these divergences can be divided into three types according to tone pattern: 1) simple high tone stems, e.g.
dUGE 'to cook (by boiling)'; 2) simple and complex low tone stems, e.g. \textipa{\textipa{\textletters{w}abe}} 'to eat (by chewing)', \textipa{\textipa{\textletters{\textletters{p}y}use}} (/p\textipa{-s\textipa{-e}/}) 'to greet'; 3) complex stems built on high tone roots, e.g. \textipa{\textipa{\textletters{k\textipa{i}ime}} (/k\textipa{-me/}) 'to fry'. For the benefit of those readers who are not familiar with Moore, I shall keep the vocabulary of the examples in the sections that follow to a minimum by using the above mentioned verbs to exemplify the three different types of tone patterns. This will save my having to identify the underlying tone pattern of the verb in each Moore example. For group (2) above I shall use only \textipa{\textipa{\textletters{w}abe}} but the same behavior holds for \textipa{\textipa{\textletters{\textletters{p}y}use}} and verbs like it.

3.24 Aspect

All non-stative verbs, when appearing as the principal verb of an indicative sentence are marked for aspect; they are not necessarily marked for tense (and in fact are frequently not so marked). Aspect, then, is the primary axis for determining past vs. present as well as completion vs. incompletion. The two aspects are imperfective and perfective and are indicated by suffixation to the verb stem.

Since the imperfective has the same segmental and tonal form in all dialects, I shall establish its tone first and then use it, as compared to the aspectless or 'neutral' form of the verb, to demonstrate the effect of Aspect on the tone of the elements which follow it in the verbal group. The discussion of the perfective will be deferred until a later section because of the fact that it elides in most
cases and its presence is indicated in the surface only in some dialects by the tone of the following element (cf. section 3.32). The arguments established to account for the tone of the elements in the verbal group when imperfective is present and when no aspect is present, will be used to demonstrate the presence of perfective in sentences where it has no segmental representation.

3.25 Imperfective

The imperfective aspect is marked by the suffix -da and is suffixed directly to the verb stem. This is illustrated in the imperative sentences of (104), where both the simple (or 'aspectless') and imperfective imperative forms are given, and in the conjoined sentences of (105).

(104) a) dùge 'Cook!'  
\[ dùgå 'Keep cooking!' /dùg-då/\]

b) båo 'Search!'  
\[ båoådå 'Keep searching!' /båo-då/\]

(105) a) à bée zákè 'n dùgå  
\[ à bée zákè 'n dùgå \]

b) à bée zákè 'n båoådå.

'She's at the compound (and) cooking.'

'She's at the compound (and) searching.'
c) `beê z'akê `n kii'mda.

L \text{H}_1 \text{H}_2 \text{H}_3 \text{L} \text{H}_4 \text{H}_5

'She's at the compound (and) frying.'

The surface tone of the imperfective is the same as that of CV noun suffixes: low after high tone stems, e.g. (104a), high after low tone stems, e.g. (104b), and non-automatic down-step after high-low stems, e.g. (104c). Therefore we need no additional rules to account for -\text{da}, since if we assign it a systematic phonemic low tone, POLAR TONE and ASSIMILATION will produce the correct surface forms, e.g. the imperfectives in (104b) and (104c) would follow the same derivational paths as the nouns in (29a) and (38d) respectively.

3.26 The Complement Marker a ~ la and Short Form Pronoun Complements.

In non-emphatic, affirmative, declarative sentences, the principal verb carries a final a in the surface when any element follows it in the same VP. Short form pronoun complements appear between the verb (plus aspect, if it is present) and the a morpheme; the a ending has the allomorph \text{la} in this environment. Long form pronouns, noun complements and adverbs always come after a. (Manessy (1963) was the first to recognize the allomorphic relationship between a and la in Moore.) This is illustrated in (106) below.

(106) a) `m p'abdà b'amb doogê.

'I'm beating \text{them} in the house.'

b) `m p'abd b la doogê.

'I'm beating \text{'em} in the house.'
The la variant also appears after the auxiliary particle έ, a past tense and conditional morpheme which follows the verb (plus aspect, if it is present); both a pronoun and έ may be present at the same time. This is shown in (107) below:

(107) a) 'm pábdé lá bámb doogé.
'I was beating them in the house.'

b) 'm pábdé b lá doogé.
'I was beating 'em in the house.'

This particle a~la will be analyzed as a complement marker (CM) and in a later section I shall present tonal evidence to show that it is always present at the systematic phonemic level when there is a complement to the verb, even when there is no segmental representation of it in the surface utterance. I will assume that the form of the complement marker in the lexicon is /-là/ and that the following morphophonemic rule applies before the tone rules:

\[ l \rightarrow \emptyset / V \ (ASP) \] a.

My aim in this section is to demonstrate how the final tone of the verb influences the tone of short-form pronoun complements and the two variants of the complement marker and to show that with only a slight revision of the POLAR TONE rule and the addition of one new rule, the many different surface tone patterns for these elements can be accounted for by already existing rules. Since, as mentioned above, the perfective aspect is rather elusive in the surface utterance and is dealt with in a later section, I have
restricted the examples in this section to verbs in the imperfective and aspectless forms. In simple imperatives, e.g. cf. (104), subjunctive clauses (cf. 3.35), and in infinitive clauses such as occur after certain auxiliaries like the future ná n 'going to', which is composed of ná plus the complementizer n, the perfective is never marked and the verb is either in the imperfective or unmarked for aspect, i.e. aspectless.

First let's start with short form pronoun complements where the complement marker has the form la. Below in (108) are sentences in which a short form pronoun complement is preceded by an aspectless, simple, high verb (108a), an aspectless, simple, low verb (108b), and an aspectless, derived, high-low verb (108c).

(108) a) tónd na n dug b la dóogé. (/dúg- bè-là/)  
H H H H L H H H2  
'We are going to cook 'em in the house.'

b) tónd na n wáb b la dóogé. (/wáb- bè-là/)  
H H H L L H H H2 H3  
'We are going to eat 'em in the house.'

c) tónd na n kjím b la dóogé. (/kjım- bè-là/)  
H H H H H H H H2 H3  
'We are going to fry 'em in the house.'

The sentences in (109) show a short-form pronoun complement preceded by an imperfective, simple, high verb (109a), an imperfective, simple, low verb (109b), and an imperfective, derived, high-low verb (109c).
(109) a) tónd dugd b la dóogé. (dug-dà-bà-là/)
H   H  H  1  H 2  H 3

'We are cooking 'em in the house.'

b) tónd wàbà b la dóogé. (wàb-dà-bà-là/)
H   L  H 1  L  H 2  H 3

'We are eating 'em in the house.'

c) tónd kîimd b la dóogé. (kî-me-dà-bà-là/)
H   H  H 1  L  H 2  H 3

'We are frying 'em in the house.

Ignoring for the moment the tone of the adverb dóogé (this will be explained in section 3.29), notice the surface tone of la in relation to the final systematic phonemic tone of the verb in the sentences of (108): in every case it is polar to the final tone of the verb, i.e. in (108a) the verb is high and la is low and in (108b) and (108c) the final tone of the verb is low and la is high. In (109) the same relation holds, if we assume that POLAR TONE has applied to the imperfective suffix -da, i.e. in (109a) the final tone of -da is low and la is high and in (109b) and (109c) after POLAR TONE the final tone of -da is high and the surface tone of la is low. Note that in every case the pronouns have the same tone as the final tone of the verb (after POLAR TONE).

Let us assume that short-form pronoun complements and the la allomorph of the complement marker have the form of suffixes in that they are bounded on the left by suffix boundary (‘) and are low tone throughout at the systematic phonemic level, e.g. /-la/; /-ā/, 'him, her, it'; /-bā/,
'them'. (The final vowel of CV short form pronouns is always reduced in non-final position, cf. section 3.21 (87) for a list of the deep and surface forms for short form pronouns.) Furthermore let us suppose that la undergoes POLAR TONE as stated in (110) below:

(110) POLAR TONE for -la
[-H] → [+H]/[^#][[-H]_2 -[+PRO] -C [+CM] V

By the established conventions, (110) can be integrated with POLAR TONE in (34) into the final form given in (111) below:

(111) POLAR TONE (final form):
[-H] → [+H]/[+BOUND][-H]_1 <[-[+PRO] > -(C(V-)) ∞ V
                                                    -∞INFLECT
                                                   ∞ CM

The ∞ variable in (111) restricts application of POLAR TONE to the complement marker to cases in which it is preceded by a short form pronoun, i.e. when it has the form -la. (As we shall see below, the a variant of the complement marker, which is never preceded by a short form pronoun, does not undergo POLAR TONE.) Both the complement marker and short form pronouns are marked [-INFLECT]. The high tone of the pronouns in (108a) and (108c) and (109a), (109b), (109c) is accounted for by ASSIMILATION. Thus with only the slight amendment to POLAR TONE proposed in (110), all the surface tone patterns for verbal group in the sentences of (108) and (109) above can be accounted for by already existing rules. Below in (112) are derivations for some of the verbal groups in (108) and (109).
(112) a) (108a)

\[
/\text{đúg} - \text{ba} - \text{la}/
\]

\[
\begin{array}{cccc}
\text{HH} & \text{LL} & \text{LL} & \\
\end{array}
\]

\[
\emptyset
\]

V REDUCTION for PRO (Note 49)

\[
\begin{array}{ccc}
\text{HH} & \text{H} & \text{HL} \\
\end{array}
\]

ASSIMILATION (98b)

\[
\emptyset
\]

[-SEG] DEL (37)

---

b) (108c)

\[
/\text{kí} - \text{me} - \text{ba} - \text{la}/
\]

\[
\begin{array}{cccc}
\text{HH} & \text{LL} & \text{LL} & \text{LL} \\
\end{array}
\]

\[
\emptyset
\]

V REDUCTION for PRO (Note 49)

(L)

V ELISION (35)

\[
\begin{array}{ccc}
\text{H} & \text{POLAR TONE (111)} & \\
\end{array}
\]

(L) ASSIMILATION (98a)

\[
\begin{array}{cccc}
\text{H(H)} & \text{H} & \text{HL} & \text{H} \\
\end{array}
\]

ASSIMILATION (98b)

\[
\begin{array}{cccc}
\text{H} & \text{H} & \text{H} & \text{H} \\
\end{array}
\]

H₁ DOWNSTEP (6)

\[
\emptyset
\]

[-SEG] DEL (37)

\[
\begin{array}{cccc}
\text{H} & \text{H} & \text{H} & \text{H} \\
\end{array}
\]

\[
\begin{array}{cccc}
\text{H} & \text{H} & \text{H} & \text{H} \\
\end{array}
\]

\[
\begin{array}{cccc}
\text{H} & \text{H} & \text{H} & \text{H} \\
\end{array}
\]

\[
\begin{array}{cccc}
\text{H} & \text{H} & \text{H} & \text{H} \\
\end{array}
\]

---

_120_
(Note that in (112c) POLAR TONE applies to -da and not to -la because it is a left to right rule, cf. the comments on (34) in section 3.8. Also, I have not included epenthetic vowel insertion in the above derivations.)

Next, let us establish the tone of the a variant of the complement marker. Since there is dialectal divergence in the tone of a, I have marked the examples below for dialect. I shall mention only the Yako dialect for the present (but cf. section 3.31 for remarks on the tone of -a in the Gilungu dialect). (113) shows the tone of a after the imperfective aspect and (114) shows it after the aspectless form.

(113) a) (Y) tōnd ḏugda némdo /dug-da-à/

H H L H₁ L

'Ve are cooking meat.'

121
b) (Y) tōnd wàbda némdò /wàb-dà-á/
   H L H₁ H₂ L
   'We are eating meat.'

c) (Y) tōnd kíjimá némdò /kí-mè-dà-á/
   H H H₁ H₂ L
   'We are frying meat.'

(114) a) (Y) tōnd na n dýgà némdò /dýg-à/
   H H H H H₁ L
   'We are going to cook meat.'

b) (Y) tōnd na n wàba némdò /wàb-à/
   H H L L H₁ L
   'We are going to cook meat.'

c) (Y) tōnd na n kíjimà némdò /kí-mè-hà/
   H H H L H₁ L
   'We are going to fry meat.'

In the above sentences, in all cases -a has the same tone as the final tone of the word which precedes it. If we were to take only the examples in (113) where the imperfective -da precedes a, we could hypothesize that a undergoes POLAR TONE (i.e. cf. section 3.8, rule (33a)). But the examples in (114) show that this cannot be so, because in these sentences -a takes on the same tone as the preceding aspectless verb stem, whereas if it were to undergo POLAR TONE it would have the opposite tone, i.e. the verb in (114b) would be assigned the form *wàbá by rule (33c) and the verb in (114a) would not undergo POLAR TONE and would keep its systematic phonemic form *dýgà. Therefore we need the rule in (115) below to raise the systematic phonemic low of -a to high when it is preceded by a high.
(115) Tone of \(-\text{a}\) complement marker

\[
[-H] \rightarrow [+H]/[+H]^-[+\text{CM}][+\text{Bound} \ X]
\]

(115) would apply in (113b,c) after POLAR TONE, e.g.

/w̃b-dà-à/ \(\rightarrow\) (POLAR TONE) w̃b-dá-à \(\rightarrow\) (115) w̃b-dá-à; \(\forall\)

ELISION elides the \(\text{a}\) of \(-\text{da}\); in the case of (114a), (115) alone would apply: /dúg-à/ \(\rightarrow\) (115) dúg-à.

With CV verbs, in many dialects, when the \(-\text{a}\) variant of the complement marker is suffixed directly to the verb stem, i.e. with no intervening segmental morphemes, it takes on the quality of the stem vowel and creates a surface long vowel, e.g. the verb dì 'to eat' plus \(-\text{a}\) becomes dì in the Yako and Gilungu dialects as shown in (116a) below, while in the Yatenga dialect the \(-\text{la}\) variant shows up, as shown in (116b).

(116) a) (Y, G) à nà n dì dòogé

'He is going to eat in the house.'

b) (Yt.) à nà n dìla dòogé

'He is going to eat in the house.'

3.27 The Tone of Short Form Pronouns in Final Position

Short form pronouns exhibit special behavior in final position. Below in (117) and (118) are examples showing respectively simple and imperfective imperatives followed by \(-\text{C}\) and \(-\text{V}\) short form pronouns in final position.

(117) a) dúg b 'Cook em!'; dúg a 'Cook it!'

\[
\begin{align*}
\text{[dúg\text{b}] /dúg-bà/} & \quad \text{H H} & \quad /dúg-à/ & \quad \text{H H}
\end{align*}
\]
b) wàbdé 'Eat 'em!'; wàbdé 'Eat it!'
[wa:b'də] /wàb-bà/
L H₁ /wàb-à/
L H₁

c) kāmdé 'Fry 'em!'; kāmdé 'Fry it!'
[kāmmdə] /kɪ-mè-bà/ H H₁ /kɪ-mè-à/
H H₁

(118) a)
dūgdé 'Keep cooking 'em!'; dūgdé 'Keep cooking it!'
[dūgdədə] /dūg-da-bà/
H H H₁ /dūg-da-à/
H H₁

b)
wàbdé 'Keep eating 'em!'; wàbdé 'Keep eating it!'
[wa:b'dədə] /wàb-da-bà/
L L H₁ /wàb-da-à/
L L H₁

c) kāmdé 'Keep frying 'em!'; kāmdé 'Keep frying it!'
H H₁

As can be seen from the above examples, in final position short form pronouns with a form of C- (where the final vowel has been deleted, cf. note 49) or -V are always high tone; this is not the case in non-final position, e.g. cf. (108b). Moreover, all the cases in which the pronoun is high in non-final position are due to the application of ASSIMILATION (cf. the derivations in (112)); but ASSIMILATION does not apply to a low tone in final position which is preceded by a suffix boundary (cf. the comments preceding (36) in section 3.8). Therefore we must propose the rule in (119) to raise the tone of mono-segmental pronouns in final position.
(119) Tone of Mono-segmental short form pronouns in final position:

\[-H \Rightarrow [+H]/[+H]\neg\frac{+\text{PRO}}{#}\]

But an additional rule is needed for the optional \(-CV\)
form of certain short form pronouns in final position, since
the final tone of these remains low when the preceding tone
is high, as shown in (120).

(120) a)

\[\text{dûg b'à } 'Cook 'em!'; \text{ dûgd b'à } 'Keep cooking 'em!'
\]

\[\text{H H L} \quad \text{H H H H}_1\]

b)

\[\text{vàb b'à } 'Eat 'em!'; \text{ vàbd b'à } 'Keep eating 'em!'
\]

\[\text{L L H}_1 \quad \text{L L H}_1\text{L}\]

c)

\[\text{kjìm b'à } 'Fry 'em!'; \text{ kjìmd b'à } 'Keep frying 'em!'
\]

\[\text{H H H}_1 \quad \text{H H H}_1\text{L}\]

In every case where a high tone precedes the pronoun, i.e.
the simple imperative in (120a) and the imperfective impera-
tives in (120b,c) after POLAR TONE has applied to the imper-
fective \(-da\), the final tone of the pronoun remains low. The
rule in (121) below raises the final tone in all cases where
the pronoun is preceded by a low:

(121) Tone of \(-CV\) short form pronouns

\[-H \Rightarrow [+H]/[+H]\neg\frac{+\text{PRO}}{#}\]

125.
By the established conventions (119) and (121) can be combined into (122) below.

(122) Tone of short form pronoun in final position:

\[
[-H] \rightarrow [+H]/[-H] - \left( \begin{array}{c}
\langle H \\
+\text{PRO}
\end{array} \right) \left( \begin{array}{c}
\text{PRO}
\end{array} \right)
\]

(122) follows POLAR TONE and precedes ASSIMILATION.

3.28 The Post-Verbal Declarative Particle me.

There is one more element which belongs to the verbal group, the post-verbal particle me. This particle appears in all non-emphatic, affirmative, declarative sentences when no NP or adverbial complement follows the verbal group. This is illustrated in (123) and (124).

(123) a) tõnd dugda me. 'We are cooking.'
    \[H H L H_1\]

b) tõnd na n duga me. 'We are going to cook.'
    \[H H H H_1\]

c) tõnd na n dug b la me. 'We are going to cook 'em.'
    \[H H H H L H_1\]

(124) a) tõnd wâbdâ me. 'We are eating.'
    \[L H H_1 H_2\]

b) tõnd na n wâba me. 'We are going to eat.'
    \[H H L L H_1\]

c) tõnd na n wâb b la me. 'We are going to eat 'em.'
    \[H H L L H_1 H_2\]

me acts like a verb complement in that the complement marker -a~la is always present when it is present. The tone of me is high after low, e.g. (123a,c) and (124b), and non-automatic downstep after high, e.g. (123b) and (124a,c); therefore I shall assign a systematic phonemic low-high tone to me and I shall assume that it is bounded by root boundary: /+me+/.
I shall make the claim that me is a declarative sentence marker (DM); syntactic arguments in favor of this view will be presented in Part II. For the present I shall simply describe its context of occurrence.

3.29 Tone Changes in the Verb Complement and the Elision of the Declarative Particle me.

In simple declarative sentences where there is a NP complement (whether it be an object or an adverb), the initial tone of the complement undergoes certain changes: 1) if it is low, it becomes high and a following high becomes non-automatic downstep in relation to it (cf. (125a,b,d)), while a following low stays low (cf. (125c)); 2) if the tone of the preceding complement marker is high, the initial tone of the complement is non-automatic downstep in relation to it (cf. (125d, e)).

(125) a) t̲únd n̲a n̲ wába y̲áka. (y̲áka = 'gazelle')
       H̲ H̲ L̲ L̲ H1 H2
       'We are going to eat gazelle.'

b) t̲únd n̲a n̲ d̲úg b̲ la d̲óog̲é. (d̲óog̲é = 'in the H̲ H̲ H̲ H̲ L̲ H1 H2 house')

       'We are going to cook 'em in the house.'

c) t̲únd d̲úgd̲á k̲úl̲d̲eooog̲ó. (k̲úl̲d̲eooog̲ó = a type of H̲ H̲ L̲ H1 L̲ H2 fresh water fish)

       'We are cooking kuldeoogo.'

d) t̲únd w̲ábd̲á y̲áka. H̲ L̲ H1 H2 H3

       'We are eating gazelle.'

127
e) *tônd wâbdâ némdô. (némdô = 'meat')

H   L  H₁  H₂  L

'We are eating meat.'

These changes do not occur in subject position as (126) shows:

(126) a) yâkâ wâta me.  
'The gazelle is coming.'

b) küldeogâ yâa sômâ.  
'The kuldeogo is good.'

On the surface, these tonal variations seem inexplicable. But note that in every case the initial tone of the complement is the same as the final tone of the declarative marker *me* when occurring in the same position, i.e. compare (124b) with (124a), (123a) with (125c), (123c) with (125b), and (124a) with (125d,e). *me* never occurs before NP complements, as the unacceptability of (127) shows.

(127) *tônd dygâ me yâkâ.

If we say that *me* is present but elided in the sentences of (125), then all of the above changes in the tone of the complement can be explained by already existing rules, i.e. the raising of initial low of the complement (and the resulting non-automatic downstep in a following high tone) can be accounted for by application of ASSIMILATION triggered by the final elided high of *me*, and the non-automatic downstep after a high tone complement marker is caused by the initial low of *me*.

The same changes occur in adjectives after the copular verb *yâ* 'to be':

128
(128)  `yaa bānega
L  H₁ H₁ H₂
(bānega = 'tiny')

'It's tiny.'

and so I shall hypothesize the presence of me in copular sentences also.

On the basis of the above arguments, I shall propose the special me elision rule in (129):

(129) ME ELISION:

[+SEG] → [-SEG]/[−DM]₁ [−Vb]₁ # \{NP, Adj\} X

ME ELISION precedes ASSIMILATION. The derivation in (130) illustrates this rule:

(130) (125d)

#t ɔ n-đ o#m ə b - d a - a + m e # y ə g - g a #
H H H L L L L L L L H L L L L L

(L) (H) ME ELIS.

(L) (L) V ELIS.

(H) H POLAR T.

H CM TONE

(L) (L) ASS.(a)

(H) H H H H ASS.(b)

Φ LOW DEL.

(H₁) H₁ (H₂) H₂ H₂ H₂ H₂ H₂ H₃ DOWN S.

Φ Φ Φ Φ Φ Φ Φ Φ Φ [−SEG]Φ D.

H H H H L L L L H₁ H₂ H₂ H₂ H₂ H₃

tōnd wābdā a yāk a

'tōnd wābdā yākā. 'We are eating gazelle.'
H L H₁ H₂ H₃

129
Although me never appears before complements of the type illustrated in (125) and (128), it is present when the following element is a conjoined sentence, e.g. (131a), or a sentential complement, e.g. (131b). 

(131) a) m kùlà me là m zoà këngà têng pùgë.
     I/went home/me/and/my/friend/went/town/to.
     'I went home and my friend went to town.'
     b) m dàtá me tì fo kûlî.
     I/want/me/that/you/go home.
     'I want you to go home.'

In (131) above neither là 'and' nor tì 'that' are subject to assimilation to the preceding high tone of me because it is separated from them by '#' and it is not elided; but these particles do undergo assimilation when preceded by an elided high, e.g. note the tone of là after bòangë 'donkey' in the conjoined phrase below.

(132) bòang lâ vèefô 'a donkey and a horse'

This is further confirmation of the hypothesis that ASSIMILATION applies over word boundary only if the high tone is elided (cf. section 3.22).

There is also a small group of emphatic or exclamatory adverbs before which me does not elide: vàà 'well!'; và, emphatic; vàsà 'again'; wà 'remember!'; së 'certainly'; bàlà 'only, simply'; mé 'also, too'; màrsà 'now'.

(133) a) tònì wàbdà me bàlì.
     'We are eating, that's all.'

130
3.30 **Tone Changes in the Verb Complement Resulting from the Elision of the Complement Marker a~la.**

There are certain types of sentences and clauses in which the declarative particle me does not occur; these include imperatives and many subordinate clauses. (A more detailed syntactic account of the occurrence of me will be given in Part II.) In all clauses where me is not present, the complement marker a~la is also not present in the surface; and if a verb complement is present, it directly follows the verb (plus aspect, if there is any). If the final tone of the verb is high and the initial tone of the complement is systematic phonemic low, the initial low of the complement undergoes ASSIMILATION. This is illustrated in the imperative sentences below where the systematic phonemic initial tone of the complement, 'yâka 'gazelle', is low. (For convenience the intransitive imperatives in (104) are repeated.)

\[(134) \ a) \ ∑\acute{u}g\acute{e}; \quad ∑\acute{u}g \ yâk\acute{a};
\]

\[
\begin{array}{llll}
H & H & \ H & H \ H_1 \\
\end{array}
\]

'Cook!'; 'Cook gazelle!';

\[
\begin{array}{llll}
\acute{u}g\acute{a}; & \acute{u}g\acute{a} \ yâk\acute{a} \\
H & L & \ H & L \ H_1 \\
\end{array}
\]

'Keep cooking!'; 'Keep cooking gazelle!'
b)  Ṽābe;  Ṽāb  yāká;
    L  L  L  L  Hi

'Eat!'; 'Eat gazelle!';

Ṽābdá;  Ṽābd  yāká
L  Hi  L  HiHi2

'Keep eating!'; 'Keep eating gazelle!'

c)  kįime;  kįm  yāká;
    H  L  H  L  Hi

'Fry!'; 'Fry gazelle!';

kįmída;  kįmíd  yāká
H  Hi  H  HiHi2

'Keep frying!'; 'Keep frying gazelle!'

Wherever the final tone of the verb stem is low, the initial tone of the complement remains low, and in the case where the final tone of the verb stem is non-automatic downstep, i.e. the imperfective of (134c), the initial tone of the complement is non-automatic downstep.

According to the formulations in section 3.22, assimilation between words, i.e. over word boundary (#), occurs only when the conditioning high tone is elided. With respect to the above sentences, one could claim that in the imperfective sentences of (134b,c) the assimilation is triggered by the elided a of the imperfective suffix -da; and in the simple imperative of (134a) one might claim that the high which conditions the assimilation is the elided supporting vowel -e. But after imperative CV verbs where no supporting vowel is present, we would expect that no assimilation occurs, but, as shown in (135), it does.
(135) kú; kú yáka
H H H H₁
'Kill!'; 'Kill a gazelle!'

I shall offer the hypothesis that what triggers assimilation of the initial tone of the complement in all of the above transitive imperatives in (134) and (135) is an elided complement marker -a, which is not present in the intransitive forms because no complement is present, and that the underlying structure of these sentences is: V(-da)-a#NP. Based solely on the above examples alone, such an hypothesis is not very convincing because of the fact that the -a variant of the complement marker always has the same tone as the final tone of the verb stem to which it is suffixed (cf. section 3.26 (113) and (114) for examples) and therefore one could claim that assimilation is triggered by the final tone of the verb, (135) not withstanding.

But much more convincing evidence for the underlying presence of the complement marker in such sentences can be found by examining the initial tone of low-tone complements that directly follow verbal groups which contain short-form pronoun objects. This is illustrated in the imperative sentences on the right of each example in (136) and (137) below, which have short form pronoun objects followed by the adverb dòogé (/dò-gó+é/) 'in the house'; the sentence on the left of each example is a corresponding declarative sentence in which la is present in the surface. On comparing the declarative and the imperative sentences in each example,
note that the initial tone of doogê exactly corresponds with
the tone of la, i.e. where ever la is low, the initial tone
of doogê remains low, e.g. (136a) and (137b,c); wherever la
is high, the initial tone of doogê is high (and the high on
its second syllable becomes non-automatic downstep in rela-
tion to its first syllable), e.g. (136b); and wherever la
is non-automatic downstep the initial tone of doogê is non-
automatic downstep on the same level as la (and the second
syllable of doogê becomes non-automatic downstep in relation
to its first syllable), e.g. (136c) and (137b). (Note that
in section 3.26 (108) and (109) where doogê appears as an
adverbial complement to the declarative sentences in the
above examples, its initial tone has been raised throughout,
regardless of the tone of la, because of assimilation to
preceding underlying mé.)

(136) a) tönd na n dug b la me;
  H  H  H  H  L  H_1

  'We're going to cook 'em.';

dug b doogê
  H  H  L  H_1

  'Cook 'em in the house!' 

b) tönd na n wäb b la me; wäb b doogê.
  H  H  L  L  H_1 H_2  L  L  H_1 H_2

  'We're going to eat 'em.' 'Eat 'em in the
  house!'

c) tönd na n kijim b la me; kijim b doogê.
  H  H  H  H  H_1 H_2  H  H  H_1 H_2

  'We're going to fry 'em.' 'Fry 'em in the
  house!'

134
(137) a) tón’d dúgd b la me; dúgd b doógé.
   H H H H H H H H H H H H H
   'We're cooking 'em.' 'Keep cooking 'em in the house!'

b) tón’d wábd b la me; wábd b doógé.
   H L H H H H H H H H H H H
   'We're eating 'em.' 'Keep eating 'em in the house!'

c) tón’d kíimd b la me; kíimd b doógé.
   H H H H H H H H H H H H H
   'We're frying 'em.' 'Keep frying 'em in the house!'

By postulating an underlying complement marker la in
the verbal groups of the above imperative sentences, we need
add no new tone rules to account for the variations in the
tone of the adverbial complement, since ASSIMILATION trig-
gerated by high tone la will account for all those cases in
which the initial tone of doogé is high, and low tone la
will block ASSIMILATION in all those cases where the initial
tone of doogé remains low. In the interest of brevity, I
have used only imperative sentences to exemplify the tone
patterns of complements when a~la is absent in the surface
utterance, but these same patterns occur for all such sen-
tences, and therefore the existence of an underlying a~la
can be postulated in all sentences which have a complement
following the verbal group and in which there is no segmental
representation of a~la in the surface.

I shall assume that there is an early rule, such as
that in (138), which elides the complement marker whenever
it is the last element in the verbal group, i.e. whenever the declarative marker me is not present. (Remember that -a -la is inserted into the verbal group by transformation only when me or some complement outside of the verbal group is present, cf. Part II for the rule.)

(138) Complement Marker ELISION:

\[
 [+\text{SEG}] \rightarrow [-\text{SEG}] / \left[ \begin{array}{c}
 +\text{CM} \\
 -\text{CM}
 \end{array} \right] \]

By the use of combinatory rule conventions CM ELISION and ME ELISION (129) can be stated as the rule in (139):

(139) ELISION of final element in Vb:

\[
 [+\text{SEG}] \rightarrow [-\text{SEG}] / \left[ \begin{array}{c}
 +\text{DM} \\
 -\text{CM}
 \end{array} \right] \]

\[
 \left\{ \begin{array}{c}
 \text{[NP]} \\
 \text{[Adj]}
 \end{array} \right\}
\]

\[
 \text{if } \alpha = +, \beta = +
\]

The condition on (139) accounts for the fact that elision of the complement marker is not dependent on any special type of complement.

In (140) below is a schema showing the deep and surface representations for the verbal group with elided declarative marker (140a) and elided complement marker (140b).

(140) a) Deep: \[ X(1)a \text{ me} \]

\[
 \text{NP} \]

\[
 \text{Vb} \]

\[
 \text{Vb}
\]

Surface: \[ X(1)a \emptyset \]

\[
 \text{NP} \]

\[
 \text{Vb} \]

\[
 \text{Vb}
\]

b) Deep: \[ X(1)a \]

\[
 \text{NP} \]

\[
 \text{Vb} \]

\[
 \text{Vb}
\]

Surface: \[ X \emptyset \]

\[
 \text{NP} \]

\[
 \text{Vb} \]

\[
 \text{Vb}
\]

136
Finally, in (141) a sample derivation for the imperative sentence in (136b), where high tone 1a is elided in the surface, is presented.

(141) (136b)
\[ \text{Vb } \hat{\text{w}} \text{ a } \text{ b } - \text{ b } \hat{\text{a}} - \text{ l } \hat{\text{a}} \text{#}[\text{d } \emptyset - \text{ g } \emptyset + \text{ e}]\# \]
\[ \text{L L L L L L L L H } \]
\[ \emptyset \text{ V REDUCTION PRO CM ELISION} \]
\[ (L)(L) \text{ } \]
\[ (L) \text{ V ELISION} \]
\[ (H) \text{ } \]
\[ (H) \text{ POLAR TONE} \]
\[ (L) \text{ } \]
\[ \text{H H H H H H H H (H)} \text{ H}_2 \text{ H}_2 \text{ DOWNSTEP} \]
\[ \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset \emptyset [-\text{SEG} \text{ DEL} \]
\[ \text{L L L L H}_1 \text{ H}_1 \text{ H}_1 \text{ H}_2 \]
\[ \text{w } \hat{\text{a}} \text{ b b d o g } \hat{\text{e}} \text{ [w } \hat{\text{a}} \text{ b b d o g } \hat{\text{e}} \text{]} \]
\[ \text{L L H}_1 \text{ H}_2 \]

3.31 A Note on the Tone of the Unelided -a Variant of the Complement Marker in the Gilungu Dialect

In the Gilungu dialect, which is very close to that spoken in Ouagadougou, the tone of the -a variant of the complement marker when it appears in the surface is always low as illustrated in (142) below:

(142) a) (G) tönd na n dygà mé; tönd dygà mé.
\[ \text{H H H H L H}_1 \text{ H H L H}_1 \]
\[ '\text{We're going to cook.}'; '\text{We're cooking.}' \]
b) (G) tón' na n wába mé ; tón' wába mé.
      H H L L H₁  H L L H₁
      'We're going to eat.'; 'We're eating.'

c) (G) tón' na n kžimà mé ; tón' kžimà mé.
      H H H L H₁  H H L H₁
      'We're going to fry.'; 'We're frying.'

(Compare the tone of -a in (G) in (142) with that of (Y) in Section 3.26 (113) and (114).)

This dialectal divergence does not show up in the la variant or elided -a, since the examples cited in section 3.26 (108) and (109) and section 3.30 (134), (136), and (137) all hold for Gilungu. Therefore, we must add a late rule which lowers high tone unelided -a for dialects like Gilungu:

(143) Lowering of high tone unelided -a in (G):

[+H] → [-H]/- [+CM]
     +SEG
     [+Bound]

3.32 The Perfective

In the previous sections I have avoided using sentences with verbs in the perfective aspect because in most cases it is not realized segmentally in the surface. One of the positions in which it has a segmental shape is with verbs occurring in sentence final position in a cleft (i.e. focus) sentence where the complement of the final verb appears in the focus position; the perfective is realized as -vá in this environment.

Cleft sentences in Moore have the following surface structure: 1) a principal clause consisting of a zero
impersonal it subject, the copular verb ɣa "to be", and the item in focus as the complement of ɣa; 2) a subordinate clause from which the focus item has been removed; 3) a function marker which follows the item in focus and marks its function in the subordinate clause: ʰ for subjects and ʰa for objective and adverbial complements; 4) the verbal group of the copular sentence contains an elided declarative marker me, as indicated by the complement marker -a on ɣa and the fact that its complement, the focus item, is subject to the tonal changes described in section 3.29, while the subordinate clause never contains me.

In (144), complement focus cleft sentences are shown for the Gilungu and Yako dialects (the perfective translates as past tense in English): ⁵¹

(144) a) (G,Y) ɣaa doog' la ɣe̞ dugyá
\[ L \ H₁ H₂ H₂ H₂ L H₃ \]
'It's in the house that she cooked.'

b) (G,Y) ɣaa doog' la ɣe̞ wabyá
\[ L \ H₁ H₂ H₂ H₂ L H₃ \]
'It's in the house that she ate.'

c) (G,Y) ɣaa doog' la ɣe̞ kiimyá
\[ L \ H₁ H₂ H₂ H₂ H₂ \]
'It's in the house that she fried.'

In the above examples the perfective is non-automatic downstep after high and high-low verbs, e.g. (144a,c) and high after low verbs, e.g. (144b). Note that the perfective does not appear with infinitives, since they are always unmarked with respect to perfective. This can be seen in (145).

139
(145) a) yaa doogé la yê na n duge.
   L H₁ H₂ H₂ H₂ H₂ H₂

   'It's in the house that she is going to cook.'

b) #yaa doogé la yê na n dugya.

The perfective also shows up as -ȳa in the surface in intransitive emphatic sentences where the declarative marker me is absent (probably through deletion):

(146) a) á táa mé. 'He has arrived.'

b) á táyyá. 'He's arrived.'

In subject focus sentences, where the verb of the subordinate clause is intransitive, -ȳa never occurs, and, if we take no account of tone, it appears on the surface as if the aspectless form is present, though the verb is interpreted as perfective. However, if we take tone into consideration, it can be seen that the tone of the final supporting vowel of verbs in this position is different from that of aspectless verbs. Also, a dialectal difference between the Yako and Gilungu dialects arises in this position, which does not occur in the aspectless form. Perfective verbs in final position of subject focus cleft sentences are illustrated in (147) and aspectless verbs in the same position are illustrated in (148). (The fact that the initial tone of the low tone verb wábe in (147b) is high is a separate phenomenon having to do with the subject marker ḋ, which will be explained in the following section.)
(147) a) (G) yaa ye' n dugi.
L H₁L H₂H₂

(Y) 'yaa ye' n dugi.
L H₁L H₂L
'It's her who cooked.'

b) (G,Y) yaa ye' n wa'be.
L H₁L H₂H₂

'It's her who ate.'

c) (G) yaa ye' n kii'me.
L H₁L H₂H₂

(Y) yaa ye' n kii'me.
L H₁L H₂L
'It's her who fried.'

(148) a) (G,Y) yaa ye' n na' n dugi.
L H₁L H₂ H₂H₂

'It's her who is going to cook.'

b) (G,Y) yaa ye' n na' n wa'be.
L H₁L H₂ L L

'It's her who is going to eat.'

c) (G,Y) yaa ye' n na' n kii'me.
L H₁L H₂ H₂ L

'It's her who is going to fry.'

In the case of the Yako dialect, the -a variant of the complement marker after perfective verbs has the same tone as the supporting vowel e for the Y sentences in (147), as shown in (149), i.e. it is low after high verbs, e.g. (a) of (147) and (149), and it is high after low and high-low verbs, e.g. (b) and (c) of (147) and (149). (As mentioned in section 3.31, -a in the Gilungu dialect is low tone throughout.)
(149) a) (Y) yë dëgë mé.
   \[ H \  \ H \  \ L \  \ H_1 \]
   'She cooked/has cooked.'

b) (Y) yë wâbâ mé.
   \[ H \  \ L \  \ H_1 \  \ H_2 \]
   'She ate/has eaten.'

c) (Y) yë kîima mé.
   \[ H \  \ H \  \ H \  \ H_1 \]
   'She fried/has fried.'

The same dialectal divergence that appears in (147) between G and Y in the final tone of the verb is paralleled in the initial tone of a low tone complement as illustrated in (150):

(150) a) (G) ñáa yë n dëg doogë.
   \[ L \  \ H_1 \ L \  \ H_2 \  \ H_3 \  \ H_4 \]
   (Y) 'ñáa yë n dëg doogë.
   \[ L \  \ H_1 \ L \  \ H_2 \  \ L \  \ H_3 \]
   'It's her who cooked in the house.'

b) (G,Y) ñáa yë n wâb doogë.
   \[ L \  \ H_1 \ L \  \ H_2 \  \ H_3 \  \ H_4 \]
   'It's her who ate in the house.'

c) (G) ñáa yë n kîim doogë.
   \[ L \  \ H_1 \ L \  \ H_2 \  \ H_3 \  \ H_4 \]
   (Y) ñáa yë n kîim doogë.
   \[ L \  \ H_1 \ L \  \ H_2 \  \ H_2 \  \ H_3 \]
   'It's her who fried in the house.'

(Compare the initial tone of the complement doogë in (150) with that of -e in (147) for G and Y, and, for Y, with that of -a in (149).)

Thus, if we assume that there is a perfective marker in the deep structure of (147), (149), and (150) which elides
in the surface, then we need add no new tone rules to account for these sentences, since the principles established in the preceding sections will account for them. Though I have not listed forms for perfective sentences with short form pronoun complements, their tone and that of the -la variant of the complement marker (and consequently the initial tone of any complement which directly follows -la) are also affected by the elided perfective in ways which are predictable from the rules already established.

The only new rule that is needed is one which elides the perfective in all cases except in final position in complement focus sentences like (144) and emphatic sentences like that in (146b). I shall hypothesize that in both of these cases where perfective does not elide that there is an underlying complement marker which has been inserted because of a deep structure complement which has been deleted in the surface, i.e. doogê in (144) on identity with doogê as complement of the matrix copular sentence, and me in (145b). Although the complement marker is itself eventually elided by CM ELISION (138), I shall assume that P ELISION (150) precedes (138), and therefore the complement marker acts as the conditioning element for the blocking of P ELISION when it occurs in sentence final position. (This is indicated by the condition on P ELISION.) Since there is no underlying complement in intransitive subject focus cleft sentences like (147), the complement marker is not inserted and P ELISION is not blocked.
(151) Perfective ELISION

\[
\begin{array}{l}
1 \quad +\text{PERFECTIVE} \\
2 \quad (\text{CM}) \quad +\text{BOUND} \\
3 \quad X
\end{array}
\]

if 4 = ∅, 2 = ∅

As for the systematic phonemic tone of the perfective, it seems to be different from dialect to dialect. In the Gilungu dialect, since it is always high after low and non-automatic downstep after high, as in (144), I shall assign it a low-high tone in all positions, i.e. /-yɑ/. (In the Yatenga dialect, for which I have not listed any forms here because of some gaps in my data, the tone of the perfective seems to behave like the imperfective, i.e. it's tone is always polar to the final tone of the verb stem which precedes it, and therefore it would be low at the systematic phonemic level: /-yɑ/.) On the other hand, in the Yako dialect the situation is rather complicated because in some cases the perfective patterns with Gilungu, e.g. (144), while in other cases it seems to be polar to the final tone of the verb stem which precedes it, i.e. (147) and (149); so for Yako it is not certain what the systematic phonemic tone is, but whatever it may be, it will be necessary to formulate special rules to regulate its tone in certain contexts. I will not attempt to do this in the present work.

In general, it appears as though Moore is in the process of losing the perfective as a marked form on the verb. This has been accomplished in the Gilungu dialect when the
perfective is followed by the unelided -a variant of the complement marker, where the late rule stated in (143) lowers high tone -a and thereby obliterates any distinction between the perfective and aspectless forms in that environment, a distinction which still exists tonally in Yako and Yatenga.

Finally, over and above the dialectal divergence in the tone of the perfective, the point of central importance is that, by means of tonal evidence, it can be demonstrated that in certain cases a verb which shows no segmental mark of aspect is in fact accompanied by an underlying perfective aspect, while in other cases such a verb is truly aspectless. This identification of the perfective is essential for a proper understanding of Moore structure because presence vs. absence of this morpheme is one of the principal criteria for distinguishing indicative subordinate clauses from subjunctive and infinitive clauses, as will be shown in Part II.

3.33 Tone Changes Between Subject and Predicate

The same principles of assimilation as apply in other parts of the sentence also apply between a subject NP and the initial tone of the predicate, as illustrated in (152). In (152a) the initial low tone of the verb \textit{v\text{\`a}\text{t\text{\`a}}} 'is coming' assimilates to the elided final high of \textit{d\text{\`a}\text{w\text{\`a}}} 'man'; in (152b) the final low of \textit{s\text{\`a}n\text{\`a}} 'stranger' blocks assimilation; (152c) shows that assimilation does not occur when the preceding high is not elided, as in \textit{v\text{\`a}\text{g\text{\`a}}} 'thieves'.

145
(152) a) dák wata mé. 'A man is coming.'
H  H H₁ H₂

b) sán wata mé. 'A stranger is coming.'
H  L H₁ H₂

c) wágá wata mé. 'Some thieves are coming.'
L  H₁ L  H₂ H₃

(Also, cf. section 3.22 (96) for examples of assimilation between subject and predicate when the past tense marker dák is the first element in the predicate.)

However, there are certain cases where it appears that ASSIMILATION applies to the initial tone of the predicate (and a following high becomes non-automatic downstep) when there is no underlying elided high tone in the subject NP which triggers it. This arises when the subject is a short form pronoun or when the predicate is preceded by the subject marker ' in subject focus cleft sentences (where I shall analyze ' as replacing the subject in the subordinate clause). This is illustrated in (153) below, again with the verb wata.

(153) a) 'a wata mé. (*a wata me.*)
L  H₂ H₃  L  L H₁ H₂

'He is coming.'

b) yaa ye 'n wata. (*yaa ye 'n wata.*)
L  H₁ L  H₂ H₃  L  H₁ L  H₂

'It's him who is coming.'

But in the case of a short form pronoun subject, if it is preceded by a high tone particle such as tí 'that', lá (complement focus marker), or bí 'or', then the low tone pronoun undergoes ASSIMILATION and an initial low in the
predicate remains low, as shown in (154). (The vowel of tí and tì elides when followed by a short form pronoun.)

(154) `b yeelá me tì a wáta mé.
L H₁ H₂ H₃ H₃ L H₄ H₅

'They said that he is coming.'

Note that tì also triggers ASSIMILATION in a following low-high noun, e.g. kambá 'children' in (155), even though its vowel does not elide.⁵² (Also, the low tone of the verb in the tí clause of (155) has assimilated to the final elided high of kambá.)

(155) `b yeelá me tí kamb wáta mé.
L H₁ H₂ H₃ H₃ H₄ H₅ H₆

'They said that some children are coming.'

Therefore I shall assume that particles like tí, which are inserted transformationally (cf. Part II), are bounded by root boundary (+) and that they are added as the leftmost member of the subject NP, since they form a phonological unit with the following word. The structure of the subject NPs of the subordinate tí clauses in (154) and (155) after boundary reduction are # [ tí + 'a ] # and # [ tí + kambá ] #
NP NP NP NP respectively, while those of (153a,b) are # [ 'a ] # and # n #.
NP NP

We can now formulate the two part rule in (156) which performs the same conjoint operations as does ASSIMILATION, i.e. [-SEG] low tone insertion and raising of lows, but in this case the conditioning environment on the left is that the sequence of lows must be in initial position in VP and that it must be preceded by a single segment low tone

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morpheme bounded on the left and right by word boundary (#), such as occurs in (153a,b), and in the matrix but not the constituent sentences of (154) and (155).

(156) Raising of Predicate Initial Low Tone:

\begin{align*}
& a) \emptyset \rightarrow \left[ \frac{-H}{\text{-SEG}} \right] / \left[ \frac{+H}{\text{#}} \right] / \left( \frac{\text{VP}}{\text{X}} \right) \\
& \quad \quad \quad \left[ \frac{-H}{\delta} \right] < \left[ \frac{+AB}{\text{\textaboveslash}_y} \right] _1 < \left[ \frac{\text{BOUND}}{-AB} \right] _y \left( \frac{[+H]}{X} \right) \\
& b) \left[ -H \right] \rightarrow \left[ +H \right] / \left[ -H \right] / \left( \frac{\text{VP}}{\text{X}} \right) \\
& \quad \quad \quad \left[ \frac{\text{VP}}{\text{X}} \right] _1 < \left[ \frac{+AB}{\text{\textaboveslash}_y} \right] _1 \left[ \frac{\text{BOUND}}{-AB} \right] _y \left( \frac{[+H]}{X} \right)
\end{align*}

(There is no need to mention the NP brackets on the subject since the VP bracket and the leftmost '#' are sufficient as a conditioning context.)

Finally, by the abbreviatory conventions in 1.5, (156) is combined with ASSIMILATION (98) into the rules in (157), which are in turn coalesced to one rule in 3.36 (8).

(157) ASSIMILATION and predicate initial low tone

\begin{align*}
& a) \emptyset \rightarrow \left[ \frac{-H}{\text{-SEG}} \right] / < \left[ \delta \right] / < \left[ \frac{+WB}{\text{\textaboveslash}_y} \right] _1 < \left[ \frac{\text{BOUND}}{\beta WB_{\text{\textaboveslash}_y}} \right] _1 < \left[ \frac{\text{BOUND}}{\text{\textaboveslash}_y} \right] _y \left( \frac{[+H]}{X} \right) \\
& \quad \quad \quad \left[ \frac{\text{VP}}{\text{X}} \right] _1 < \left[ \frac{\text{BOUND}}{-AB} \right] _y \left( \frac{[+H]}{X} \right)
\end{align*}

b) \left[ -H \right] \rightarrow \left[ +H \right] / < \left[ \frac{+WB}{\text{\textaboveslash}_y} \right] _1 < \left[ \frac{\text{BOUND}}{\beta WB_{\text{\textaboveslash}_y}} \right] _1 < \left[ \frac{\text{BOUND}}{\text{\textaboveslash}_y} \right] _y \left[ \frac{\text{BOUND}}{\text{\textaboveslash}_y} \right] _y \left( \frac{[+H]}{X} \right)

Conditions:

1) if \( \beta = + \), then \( \alpha \) or \( \delta = - \)
2) if \( \delta = - \), then \( \emptyset = + \)

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The delta and theta variables and conditions 1 (i.e. the second disjunct) and 2 limit the leftmost conditioning tone to low just in case it is bounded on the left and right by Word Boundary (#) and followed by VP. The variables linking VP (i.e. θ) and the preceding tone (i.e. ϝ) must be separate because the rule will also apply when both ϝ and θ are plus, as is the case in (152a). I shall not provide a derivation for (156) since it performs the same operations as ASSIMILATION, which is amply exemplified in preceding derivations.

3.34 A Note on Previous Analyses of the Post-Verbal Particles -a~ -la and me.

There are only two previous analyses of the post-verbal particle -a~ -la, R. P. Alexandre's *La Langue Moré* (Alexandre, 1953, Vol. 1, pp. 98 and ff.) and a most interesting article by G. Manessy: "Les particules affirmatives postverbales dans le groupe voltaïque" (Manessy, 1963). Manessy disproves Alexandre's thesis that -a is the mark of the perfective by demonstrating that -a and -la are variants of the same morpheme and that la occurs with the imperfective as well as the perfective. He rightly identifies -vā as the mark of the perfective. (In addition he points out that the final vowels -e~ -i of CVC verbs are best analyzed as supporting vowels which are phonologically predictable and not as a subjunctive suffix as Alexandre proposes.) Up to this point I accept Manessy's analysis. But he then concludes that -a ~ -la is an affirmative particle because it does not appear
in negative sentences. This conclusion can be shown to be false.

First of all, Manessy's data is incomplete in that he presents only sentences in the 'indefinite' negative in which the final particle ye is present and where -a~la does not appear in the surface, as the sentences in (158) show. (The indicative negative in Moore is expressed by placing pà or ká, which are in free variation, before the verb; if the particle ye is present, it goes at the end of the VP.)

(158) a) a ka dug ye;
L H₁ H₁ H₁
'She hasn't cooked (yet).'

`a ka dugd ye.
L H₁ H₁ H₁
'She isn't cooking (yet).'

b) `a ka dug doog' ye;
L H₁ H₁ H₁ H₂ H₂
'She hasn't cooked in the house (yet).

`a ka dugd doog' ye.
L H₁ H₁ L H₂ H₂
'She isn't cooking in the house (yet).'

c) `a ka dug b doog' ye;
L H₁ H₁ H₁ L H₂ H₂
'She hasn't cooked 'em in the house (yet).'

`a ka dugd b doog' ye.
L H₁ H₁ H₁ H₂ H₃ H₃
'She isn't cooking 'em in the house (yet).'

There is, however, a second type of indicative negative, not mentioned by Manessy, where ye is not present and where -a~la and me show up in the surface. This 'definite'
negative is illustrated in (159) below. 53

(159) a) (Y) `a ká dúga me; `a ká dúgdà me.
L H₁ H₁ H₁ H₁ L H₁ H₁ L H₂
'She didn't cook 'She isn't cooking (at all).'
(at all).

b) (Y) `a ká dúga dóogé; `a ká dúgdà dóogé.
L H₁ H₁ H₁ H₂ H₃ L H₁ H₁ L H₂ H₃
'She didn't cook in 'She isn't cooking the house (at all).' in the house (at all).

c) (Y) `a ká dúg b lā me; `a ká dúgd b lā me.
L H₁ H₁ H₁ L H₂ L H₁ H₁ H₁ H₂ H₃
'She didn't cook 'em 'She isn't cooking (at all).' 'em (at all).

This group of examples in itself refutes Manessy's analysis. But over and above that, by the same line of argumentation presented in section 3.30, it can be shown that -a- -la is present as well in sentences with indefinite negatives where a complement follows the verb, though it elides in the surface. Thus there is a perfect correspondence between the tone of -a in (159a,b) and the initial tone of the adverbial complement dóogé in (158b), where -a is elided, and between the tone of -la in (159c) and the tone of dóogé in (159c), where -la is elided. 5h The altered tone of dóogé in (159b) is caused by assimilation of its initial low tone to an elided me (cf. section 3.29). (I have presented only examples for the high tone verb dúge, but there are exact correspondences for the other tone types as well.) From this it can be seen that the principle difference between the 'indefinite' and 'definite' main clause indicative

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negatives is that the former contains \textit{yé} and no declarative marker `mé, while the latter contains `mé but no \textit{yé}, i.e., \textit{yé} and `mé are mutually exclusive.

A final point in favor of analyzing -\textit{a}-\textit{la} as a complement marker is that, as stated in section 3.32 (cf. (144) and preceding remarks), complements in the focus position of complement focus cleft sentences are marked by \textit{lé}, while subjects in focus have a different marker, although the tone of the complement focus marker is invariant.

As for \textit{me}, Alexandre notes its appearance in sentences but says nothing as to its function. Manessy (p. 112) in a single sentence suggests that it is the emphatic adverb \textit{me} meaning 'also, even'. This hypothesis can be eliminated by pointing out that the adverb \textit{me} can co-occur with the post verbal declarative particle \textit{me} as shown in section 3.29 (133b). Furthermore, the adverb \textit{me} can occur after NP's or at the end of the entire sentence:

(160) a) \textit{là akúlg \textit{mé} wáá \textit{mé}.}  
'And Kulga also came.

b) \textit{là akúlg wāba' nāyṹ \textit{me}.}  
'And Kulga ate sweet potato too.

It is true, though, that the two are homophonous, since the adverb \textit{me}, like the declarative marker, is always high after low and non-automatic downstep after high and therefore will be assigned a systematic phonemic low-high tone.

As we shall see in Part II, in a thorough investigation
of sentential verb complementation, the particle me as a declarative marker plays a crucial role in Mooré structure. 3.35 On Defining the 'Subjunctive' in Mooré

The subjunctive in Mooré is not marked by any overt suffix or tonal change in the verb. Rather it is defined by a series of grammatical contexts: 1) a verb in the subjunctive may be marked for imperfective aspect but not perfective aspect; 2) a clause which is in the subjunctive may not contain the post-verbal particle me (but for a surface violation of this cf. the rule for me transportation in Part II); 3) in the negative, a subjunctive clause takes a special negative verb dá, while negation in the indicative is marked by ká or pá. (1) and (2) above are not sufficient to define the subjunctive since the infinitival form of the verb may exhibit these features. (Compare the verbs in final position in the non-subjunctive clauses in the focus sentences in section 3.32 (144) with those in final position in the subjunctive clause in the sentences of (161) below; their relative tones are identical.)

(161) a) à dáta me tì tôn̄d duje.
   L H₁L H₂ L H₃ H₂H₃
   'He wants us to cook.'

b) à dáta me tì tônd wàbe
   L H₁L H₂ L H₃ LL
   'He wants us to eat.'

c) à dáta me tì tôn̄d kíime
   L H₁L H₂ L H₃ H₂ L
   'He wants us to fry.'
But in the negative the two clause types differ in that the subordinate clause of the focus sentence in (162a) takes ka~pá as a negative while the sentential complement in (162b) takes dâ:

(162) a) yàa náyuí la a ká na n ñye.
   'It's sweet potato that she isn't going to cook.'

b) a dâtâ mé tì tônd ñâ ñye.
   'He wants us not to cook.'

(The reason for the lack of the 'indefinite' negative particle yé in (162a) is not clear; it does not occur in certain types of subordinate clauses, namely focus sentences, relative clauses, and factive nominalizations, i.e. clauses which are dominated by NP. But this lack of yé has nothing to do with the indicative vs. subjunctive distinction.)

Previous analysts (Manessy, ibid. and Alexandre, ibid.) have assumed that all clauses which lack -a~-la in the surface are in the subjunctive. This includes the following: imperatives, certain types of sentential verb complements, purpose clauses, relative clauses, factive nominalizations, subordinate clauses in cleft sentences, 'indefinite' negative sentences, certain non-initial conjoined sentences, and conditional clauses. In not taking tone into consideration, they have based their analyses solely on surface segmental structure, and hence their identification of such morphemes as perfective aspect, -a~-la, and mé is incomplete. In Part II I shall examine subjunctive clauses in detail and it
will be shown that only some of the above clause types are in fact subjunctives.

3.36 Index of Rules

In the following list of rules, the numbers in parentheses after the title of the rule refers to the rules in the text upon which it is based. The order of the rules in the grammar is indicated by the order in which they are listed in this section.

Morpheme Structure Conditions:

1) Structure of Noun and Verb Roots: (14)

\[
\begin{array}{c}
\left[ + [C_H] [\alpha_H] \left( \left[ V \right] \right) \right. \\
\left. \left\{ \left[ N_H \right] \left[ V \right] \right\} \right]
\end{array}
\]

2) Structure of Affixes: (20)

\[
\langle - \left[ \beta H \right] \rangle \alpha - \beta \left[ \alpha_H \right] \beta - \alpha - \alpha
\]

Phonological Rules

Elision Rules:

1) Perfective ELISION: (151)

\[
\begin{array}{c}
\left[ +\text{SEG} \right. \\
\left. \left( \left[ +\text{PERECTIVE} \right. \right. \\
\left. \left( \left[ \text{CM} \right. \right. \\
\left. \left( +\text{BOUND} \right. \right. \right. \\
\right]
\end{array}
\]

Condition: if $4 = \emptyset$, then $2 = \emptyset$
2) ELISION of the Final Element in Vb (i.e. -a~-la or me): (129), (138), (139).

\[
[-\text{SEG}] \rightarrow [+\text{SEG}] \left/ \begin{array}{c}
\text{[\alpha DM]} \\
\text{[\alpha CM]}
\end{array} \right\} \text{Vb} \# \left\{ \begin{array}{c}
\text{NP} \\
\text{ADJ}
\end{array} \right\} \beta \chi
\]

**Condition:** if $\alpha = +$, $\beta = +$

3) Suffix VOWEL ELISION: (35), (note 49)

\[
[-\text{SEG}] \rightarrow [+\text{SEG}] / -(C) \left/ \begin{array}{c}
\text{[+BOUND]} \\
\text{[+SEG]}
\end{array} \right\} \text{V} \left/ \begin{array}{c}
\text{-NASAL} \\
\text{-PRO} \\
\text{-CM}
\end{array} \right\}
\]

4) REDUCTION of the vowel in CV short form pronouns: (Note 49)

\[
V \rightarrow \emptyset / [+\text{BOUND}] \left/ \begin{array}{c}
\text{[+PRO]}
\end{array} \right\} Y
\]

**Condition:** if $Y = \#$, PRO REDUCTION is optional.

**Tone Rules:**

5) POLAR TONE in inflectional suffixes and the Complement Marker -la: (33), (34), (110), (111)

\[
[-\text{H}] \rightarrow [+\text{H}] / [+\text{BOUND}] [-\text{H}] \left/ \begin{array}{c}
\text{[-\alpha INFLECT]}
\end{array} \right\} \text{V} \left/ \begin{array}{c}
\text{-CM}
\end{array} \right\}
\]

6) Tone Raising in the -a form of the Complement Marker: (115)

\[
[-\text{H}] \rightarrow [+\text{H}] / [+\text{H}] \left/ \begin{array}{c}
\text{[+CM]}
\end{array} \right\} [+\text{BOUND}] X
\]

7) Tone Raising in Short Form Pronouns in Final Position: (119), (121), (122)

\[
[-\text{H}] \rightarrow [+\text{H}] / [-\text{H}] / [-\text{H}] / [\text{[+H]} \left/ \begin{array}{c}
\text{[-\alpha PRO]}
\end{array} \right\} \left/ \begin{array}{c}
\text{[+PRO]}
\end{array} \right\} \#
\]

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8) TONAL ASSIMILATION and the Raising of the First Tone of the Predicate after Monosyllabic Low Subjects: (36), (74), (76), (77), (95), (97), (98), (156), (157)

\[ \left\{ \begin{array}{c} \emptyset \\ [-H] \end{array} \right\} \rightarrow \left\{ \begin{array}{c} [-H] \\ [-\text{SEG}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+H] \\ [-\text{SEG}] \end{array} \right\} \text{ with } 2 \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{WB}] \end{array} \right\} \]

\[ \left\{ \begin{array}{c} [-H] \\ [-\text{SEG}] \end{array} \right\} \] \text{ with } 3 \left\{ \begin{array}{c} [-H] \\ [-\text{SEG}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\}

Conditions:
1) if \( \beta = + \), then \( \alpha = \) or \( \sigma = - \)
2) if \( \sigma = - \), then \( \theta = + \)
3) if \( 2 = \# \) and \( 3 = [+\text{RAISING}] \), 1 and 3 are indirectly dominated by the same NP. (cf. 101)

9) Stem RAISING in Nouns and Adjectives: (28)

\[ [-H] \rightarrow [+H] \text{ with } l \left\{ \begin{array}{c} [+\text{RAISING}] \\ [N] \end{array} \right\} \text{ with } 2 \left\{ \begin{array}{c} [+] \\ [+\text{NUM}] \end{array} \right\} \text{ with } W \left\{ \begin{array}{c} [-\text{AB}] \\ [A] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\}

Conditions:
1) \( Y \) and \( Z \) contain no \( [+\text{BOUND}] \\ [-\text{AB}] \)
2) 1 and 2 are not two separate NPs dominated by the same NP (i.e. they are not in a possessive construction cf. section 3.20)

10) Suffix LOW tone VOWEL DEletion: (72)

\[ [-H] \rightarrow \emptyset/X -(C) \text{ with } \left\{ \begin{array}{c} [+\text{BOUND}] \\ [Y] \end{array} \right\} \text{ with } 3 \left\{ \begin{array}{c} [+] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\} \text{ with } l \left\{ \begin{array}{c} [+\text{BOUND}] \\ [-\text{AB}] \end{array} \right\}

Conditions:
1) if \( Y = \emptyset \), LOW-V-DEL is optional
2) if \( 2 = \# \), 1 and 3 are not dominated by the same NP (i.e. 1 and 3 are not a possessive construction cf. section 3.20)
11) Lowering of High Tone Unelided -a in (G): (143)

\[ [+H] \rightarrow [+H]/-[+CM]+[+BOUND] \]

12) DOWNSTEP

a) Assignment of pitch level to phrase initial high and low: (6a)

\[ \begin{align*}
[+H_\Phi]_1 \rightarrow [+H_0]_1 \\
[-H_\Phi]_i \rightarrow [-H_{-2}]_i \\
\end{align*} \]

\[ X \# Y \]

b) Assignment of pitch level to non-initial high and low: (66)

\[ \begin{align*}
[+H_\Phi]_i \rightarrow [+H_x]_i \\
[-H_\Phi] \rightarrow [-H_{x-3}]_i \\
\end{align*} \]

\[ X \# \begin{align*}
[+H_y]_i \rightarrow [+H_y+1]_i \\
[-H_y]_i \rightarrow [+BOUND]_o_1 \\
\end{align*} \]

13) [-SEG] DELETION: (37)

\[ [-SEG] \rightarrow \emptyset \]
3.37 Footnotes

1. This type of system was first described by William Welmers (cf. Welmers, 1959). Some other early treatments are found in Arnott (1964), Schachter (1961), and Winston (1960).

2. Canu (1969) recognizes three distinctive tones in Mooré: high, mid, and low. He lists very few examples in his section on tone (pp. 24-27). In most cases the three-way distinctions he recognizes can be attributed to the downstep phenomenon, thus the facts noted in (3a) and (3b) in the text could account for his transcribing what I analyze as low-high throughout as mid-high or as low-mid, depending on where it occurs in a sentence or in a set of listed examples.

   However, he does list one set of examples in which he finds a three-way distinction in three monosyllabic words: 1) ki (high) 'to hold something at the mouth'; 2) ki (mid) 'millet'; 3) ki (low) 'to die'. Unfortunately I do not have (1) in my data, but (2) and (3) I have recorded as high and low respectively. If one could find such a three-way distinction in monosyllabic words, then this would be convincing evidence in favor of a three tone system. I can only say that out of a sample of hundreds of such monosyllabic words I have found no three-way contrasts.


4. Recently it has been discovered that basic three tone systems (i.e. high-mid-low) also have automatic and non-automatic downstep, c.f. Armstrong (1968); Courtenay (1968).

5. I am indebted to Mr. André Wilson of the Institute of Linguistics (West Africa) for this observation (private correspondence). I should add that this is based on personal observation and to my knowledge has not been tested by machine. It is my impression (and that of Mr. Wilson) that upon comparing two sentences like (3a) and (3b) that initial high and low are higher than non-initial first high and low respectively.

6. Of course in any utterance a speaker may pause at some major constituent boundary, in which case the terracing process will begin again with a new initial H or L. For example, in (1), a speaker might well pause for breath after '...dáam...', and then the $L_3^2H_4^1L_5^1H_2$ would become $LH_1^1L_1^1H_2$.

   It should also be noted that a non-final pause in Mooré is often accompanied by a pronounced rising tone on the
syllable where the pause occurs, e.g., sáanáwáá mé 'The stranger has come,' but sáaná, [sáaná'] wáá mé 'The stranger, has come.'

Also, I should make it clear that the basic tone patterns stated in this work such as that in (1) all carry a normal intonation. These patterns may change when other intonation overlays such as emphasis, anger, etc., are added (cf. Schachter's Comments on Twi in Stewart, ). These may affect the terracing of automatic downstep, but not that of non-automatic downstep. This study will not deal with any other than the normal statement intonation pattern.

7. The actual value of $o$ and $-2$ is determined by the number of downsteps in the phrase over which the downstep rule operates. In a phrase where only one downstep is required, the real value of the initial pitch will be lower, whereas if there are more it will be higher.

8. In a previous paper (Peterson, 1967), I stated that terracing of highs resulted from a preceding high-low sequence. The facts noted in (3a) and (3b) show this to be in error.

Schachter and Fromkin (1968, pp. 106 ff.) make the same error in their treatment of downdrift in Akan. Thus their (P86a), which is roughly equivalent to my (6a) above, assigns a pitch value $n$ to all initial tones; they are then forced to informally give a value for $n$ when it is assigned to initial high and low. This fails to capture the important fact that high and low must be given independent values in initial position and then all subsequent highs and lows receive their values relative to a preceding low and high respectively.

Also, their rule (P86b), which is roughly equivalent to the bottom part of my (6b), contains a flaw in that it assigns too great an integer to non-initial first high and therefore non-initial first high and initial high are given the same pitch level. Unless Akan differs from Mooré in this one respect, which seems unlikely, this is an incorrect output. This may be simply an oversight, however, since their (P86c), which is roughly equivalent to the top part of my (6b), correctly assigns a lower pitch value to a non-initial first low than is assigned to an initial low.

9. John Stewart of the University of Ghana at Legon was the first to suggest this analysis of terraced level systems (Stewart, 1964), though his treatment is in a non-generative framework.
10. Originally I had assumed that the automatic down-step rule preceded the assimilation rule (cf. Peterson 1967, 1968). However, for reasons which I shall go into in more detail below, I now find that this order must be reversed. This necessitates the insertion of [-SEG] low tone into the assimilation process rather than a simple change from low to high (L → H) in order that there remain a low tone upon which DOWNSTEP (6) can operate.

I am indebted to Paul Schachter for suggesting this possibility. He has found evidence for a similar view of assimilation in Twi (cf. Schachter and Fromkin, 1968).


12. Often times personal names are taken from regular nouns or days of the week, e.g. kulga 'river', akulga 'a man's given name'; tene 'Monday', atene 'a man's given name'. This prefix also appears with all cardinal numbers acting as quantifiers, e.g. liyugj 'bucket', yembr 'one'; liuyug ayembr 'one/a bucket'; liuyugb 'buckets', yiibj 'two': liuyug ayiiblj 'two buckets'. As Alexandre (ibid. Vol. I) has noted, this prefix is probably a vestige of a former stage in the language when noun classes were marked by a prefix and a suffix; i.e. a discontinuous morpheme, as is still the case in other Voltaic languages such as Gourmantché (cf. Prost, 1964). A full system of concord also remains in other Voltaic languages, but has been completely lost in Mooré.

13. There is an interesting phonetic feature of low tone verbs: when in final position they end in a glottal stop. Phonetically (11b), (12b), and (13b) are pronounced [koʔ], [yagɛʔ], and [kפיʔ] respectively.

14. In spite of the fact that these verbs end in a vowel, we can classify them as CVC, since, as mentioned in section 2.2.10, final vowels of this sort act as supporting vowels and are completely predictable from the stem to which they are added. The tone is always the same as that of the last segment of the stem to which it is added. These vowels can be handled either by a lexical redundancy condition, in which case forms such as (10) would be represented in the Lexicon by four segments, the last of which would be completely predictable except for the feature [+SEGMENT]; or it might be proposed that a phonological rule inserts the vowel, in which case we need list only three segments in the Lexicon for roots such as those in (12). I shall assume the latter, since in some cases the perfective morpheme intervenes (in elided form) between the root and final supporting vowel (cf. section 3.32 (147)).
15. This could be controverted if we were to reject the analysis of nouns with CVCC stems as root plus suffix as proposed in section 3.8.

16. Note that this MSC means that voiced and voiceless segments alike are assigned a tone in the Lexicon, even though a voiceless consonant cannot have any tone in actuality. Thus there must be a low level phonetic rule:

\[
[\alpha \mathcal{H}] \rightarrow \emptyset /[-\text{Voice}]
\]

which deletes the feature for tone in voiceless segments.

17. The long vowel in the root is explained in section 2.2(1).

18. دیلگع and دیلگع have no difference in meaning. However, I shall analyze the former as consisting of root plus two suffixes, since both -le and -ge occur separately as suffixes elsewhere. The change in tone of -لع in دیلگع will be accounted for by the rule of tonal assimilation (cf. section 3.8 (36)). The loss of the final vowel م of -le will be accounted for by the suffix final vowel elision rule (cf. section 3.8 (35)); the schwa's are inserted by a rule implied by the section on vowel epenthesis (cf. section 2.2 (9)).

19. This root is irregular and looses its final consonant unless followed by a suffix. Loss of the final C of a CVC root is a common irregularity. The change of ل to ل in (19b) and (19c) is explained in section 2.3 (9).

20. In section 2.3 it was stated that certain consonant segments, voiceless stops among them, do not occur in root final position at the systematic phonemic level. This is supported by the fact that at the systematic phonetic level there are no CVC verbs ending in ك with a high-high tone pattern (i.e. high on the root and high on the final supporting vowel) but only high-low or low throughout. As stated in section 2.3 (1) there is a rule which changes geminate voiced stops to a voiceless stop of the same articulation. Thus all roots with surface ي، س، or ك as a final consonant are analyzed as root plus suffix.

21. There is a class of diminutives which is formed by the addition of the adjective بیلا، بی 'little' to the noun root, e.g. بەوە، بەوە 'granary(s)', بەوە بیلا، بەوە بی 'small granary(s)'; ناەگە، نیسە 'chicken(s)', نهی بیلا، نهی بی 'pullet(s)'. This follows the same principles as do other noun plus adjective constructions (cf. section 3.18, Table I(1b) and (3b)). Note that بیلا has a systematic phonemic low tone root which raises (cf. section 3.7 (28)); also, the plural of بیلا is irregular.
22. This is classed as CVV root and not a case of insertion of the suffix vowel into the root (cf. section 2.2 (9)) because the diphthong is present even when the suffix is not, e.g. liu bedré 'a big bucket'. Such is not the case with words with CV roots such as nônàgà 'chicken', e.g. nô bedré 'a big chicken'.

23. In some sense, this solution is forced upon us by the Stanley and Chomsky-Halle theoretical framework which stipulates that all phonological matrices are fully specified in the Lexicon. Originally I had conceived of this polar relationship between the tone of the root and the suffix as a case of neutralization of tone in the suffix. Formerly, when redundant features were left blank in the Lexicon and filled in by rule, this could be handled by a rule which would assign a tone to the suffix on the basis of the tone of the root by means of an alpha variable roughly as follows:

\[ [\text{OH}] \rightarrow [-\alpha H]/[\alpha H] \]

The above approach is not feasible when all matrices are fully specified, since it would require listing two different matrices (i.e. with respect to tone) for each suffix. So we are forced to specify all such suffixes as either high or low and then later adjust those which occur with a non-polar root. It would seem that the choice of tone for polar suffixes in the Lexicon is arbitrary, i.e. why not specify them as high and then have a rule which lowers high tone suffixes after high tone roots?

It may be argued that this dilemma can be resolved by a theory of markedness, such as Halle and Chomsky (ibid.) propose, where every feature has a universal unmarked (U) (or 'normal') value and marked (M) (or 'non-normal') value (where if \( U = + \), \( M = - \) and vice versa). Schachter (1969) has argued that low (i.e. [-High] in my terminology) is the unmarked value for the feature tone. If this is so, then the choice of low tone as the tone of suffixes in the Lexicon is justified. I am not completely convinced of this. I feel that such cases of neutralization present a difficulty for present phonological theory which cannot easily be resolved.

24. For example, a given low tone root may undergo RAISING in one derivative but not in another, e.g.

a) dà 'to buy'
dáabo 'buying' /dà-bo/ ( [+RAISING] )
dàagá 'market' /dà-gà/ ( [-RAISING] )
b) zàbe 'to dispute'
zápo 'disputing' /zàb-bɔ/ ([+RAISING])
zàbré 'a dispute' /zàb-re/ ([−RAISING])

There is, however, one generalization that can be made with respect to this rule: in nouns and adjectives derived from verbs, RAISING applies only to words formed on simple verbs (i.e. verbs which contain no [−INFLECT], i.e. derivational suffixes) and never to words formed on derived verbs. This can be seen most clearly in verbal nouns (cf. section 3.9) and agent nouns (cf. section 3.10). But I am reluctant to hypothesize the existence of a derivational suffix in the underlying forms of simple nouns which do not undergo RAISING, such as (21a,b,c), as a conditioning element which prevents RAISING. Therefore, I will use the rule feature.

25. The variables X and Y in RAISING are necessary because of the plural of agent nouns which are formed on simple low tone verbs (cf. section 3.10 (41)), where RAISING applies not only to the sequence of lows in the initial part of the word, but also to the final low which is separated from the first sequence of lows by a high tone (due to POLAR TONE), i.e. dà-dà-bà/ → (RAISING where X = ∅ and Y = ...à-bà) dà-dà-bà → (RAISING where X = dà-dà-b... and Y = ∅) dà-dà-bà dààdàba [dààdàbá] 'buyers'.

26. Many nouns belonging to the fo/i class exhibit irregular behavior: the vowel of the stem is replaced by i in the plural; there is no harmonic reflex e/i for the plural, though there is for the singular (i.e. fo/fu); in many CVC roots the final consonant is dropped in the singular and it or some other consonant appears in the plural; when modified by an adjective, the lost consonant appears (e.g. (a) below).

a) wàsfó, wìsì 'snake'; wàg songó 'a good snake'
b) nàsfó, nìsì 'cow'; nàg songó 'a good cow'
c) wësfó, wiidi 'horse'; wèd songó 'a good horse'
d) zìfì, zìmà 'fish'; zìm songó 'a good fish'
e) kìnfù, kìndì 'pearl'; kìn songó 'a good pearl'
f) kàsfó, kà 'millet'; kà songó 'good millet'
g) sjìfù, sjì 'bee'; sjì songó 'a good bee'
h) sìinefù, sìini 'ear of sesame'; sìin songó 'a good ear of sesame'
i) nìfù, nìni 'eye'; nìn songó 'a good eye'

I shall consider that nouns of the fo/i class that have a H-H₁ pattern have stems with a complex structure consisting of root plus suffix like that schematized in (29). In the case of complex stems with CVC roots, the final C of the root is deleted when a noun suffix (fo/i) follows the stem ((e) above is an exception); the suffix in the complex stem
is deleted except when followed by the plural -i. In the case of stems containing CV roots (e.g. (f)), the suffix in the complex stem is always deleted, i.e. it never shows up in the surface ((h) above is an exception). (i) is an example of a noun of this class which does not have an underlying complex stem.

I shall claim that the systematic phonemic representation of (a) above is: /#wag-sV- \{fò\}#/}

27. Other nouns like this are: pòndrä, poanda (stem: /#pòn-dV-/) 'toad(s)'; kàtře, kàtä (stem: /#kàd-dV-/) 'hyena(s)'; têtgà, têtše (stem: /#tèd-dV-/) 'prop(s)'; windgà (stem: /#wìn-dV-/) 'sun'; tiuudgu, tiuutù (stem: /#tiu-dV-/) 'granary(s)'; tàoongó, tàoando (stem: /#tà-nV-/) 'creepers plant(s)'; fëesré, fëaša (stem: /#fè-sV-/) 'fabirama(s)'; wàgdrä, wàgdà (stem: /#wàg-dV-/) 'thief(s)'.

Note that in many cases the suffix of the complex stem is -dV. Although we can never know for certain its origin, it could well be the imperfective suffix -da; I have nevertheless represented all vowels of suffixes in complex stems as non-distinct (V) since they never appear in the surface.

28. (34) includes the rule in (a) below, which is not mentioned in the text:

\[
\begin{array}{c}
\text{a) } [-H] \rightarrow [+H]/[-H]_1 \text{-CV-} \\
\end{array}
\]
\[
\begin{array}{c}
\text{+INFLECT} \\
\end{array}
\]

(a) is applicable in agent nouns formed on derived verbs, cf. section 3.10 (44) and (45).

Also, the fact that the feature for word boundary, [WB], is not specified in the initial boundary element of the environment, means that it may be root boundary (+) or word boundary (#). Such is the case in adjective phrases and compounds, which have the form #STEM+STEM-SUFFIX#, cf. section 3.18. Thus (34) allows '+' in the same places as it allows #, i.e. (33a,b,c), and therefore adds three more rules in addition to (a) above.

29. This example is not completely convincing, since it is conceivable that (33a,b,c) could be conjunctively ordered with respect to (33d), the former group being ordered to precede (33d). But this solution becomes unfeasible when we take into account nouns of the form #CV(C)-CV-CV-CV# where (33d), if unrestricted, could apply either to the last suffix on the right or the last but one. Such a case arises in agentive nouns formed on derived verbs, e.g. koosdbà 'sellers', cf. section 3.10 (44).
30. An alternative possibility is to assume that (3h) is a cyclic rule and that the leftmost suffix in a complex noun is in the first cycle and the second from the left is in the second cycle, etc. But the choice of the left-to-right convention over that of the transformational cycle is not necessarily an arbitrary decision. With respect to Moore, one might be more inclined to accept the transformational cycle if there were a mass of evidence which dictated its necessity; but, to my knowledge, this is the only instance which might justify its existence. On the other hand, we have seen that a left-to-right convention is necessary for the downstep rule. In addition, it has been found that such a convention (i.e. 'iterative rules') is often implied and necessary for phonological rules in many other languages as well (cf. Johnson, 1970).

31. The parentheses on the elements on the right hand side of (36b) implies four different expansions preceding X:

a) [-H] # [+H] X
b) [-H] # X
c) [-H] [+H] X
d) [-H] X

Since such a sequence of lows is always followed by high tone, word boundary, or both, i.e. (c), (b), or (a), (d) is vacuous.

32. There are a few words which violate this pattern. For example the verbs yā 'to see' and māo 'to wrestle', which appear on the surface to be high tone simple verbs, have a tone pattern in their verbal nouns which is like that of verbal nouns formed with derived verbs (i.e. (40c)): yāabo 'seeing' and māobō 'wrestling'. (Yā behaves like a complex high tone verb in other constructions too; I don't have further data on māo.) It is possible that this is the vestige of an ancient suffix.

33. There is a slight discrepancy in the phonetic representation of the plurals of (44b) and (45b) where two epenthetic vowels are present. In each case the one to the left carries the same tone as the one which follows. According to the rules which have been established, the phonetic representations will come out as *[kōosōdōbā] and *[gǔlsōdōbā] where the two epenthetic vowels in each example do not have the same tone, the first agreeing in tone with the preceding segment rather than with the following; note that in the case of the singulars where only one epenthetic vowel is present, the tone follows the predicted pattern: [kōosōdā] and [gǔlsōdā] and not *[kōosōdā] and *[gǔlsōdā]. I shall assume that there is a late readjustment rule such as that below which changes the tone of the first of the two
epenthetic vowels and the tone of the intervening consonant segment to that of a following epenthetic vowel:

\[ [\kappa^{-\l}_x] \rightarrow [\beta^{-\l}_y]/[\delta] [\kappa] [\beta^{-\l}_y] \]

34. The vowel change in the root for this word is irregular, though there are other words which undergo a similar change, particularly with the suffix -i, cf. note 26.

35. This is the expansion for NP which was adopted by the Air Force English Syntax Project at UCLA (cf. Stockwell, Schachter, and Partee, 1968). I won't recapitulate here the arguments in its favor. But notice that in Mooré the determiner comes to the right of NOM; in the case of relative clauses this would place the relative between the antecedent and the determiner:

\[
\text{NP} \\
\text{NOM} \quad \text{D} \\
\text{NOM} \quad \text{S} \\
\text{N} \quad \text{Number} \\
\]

= N+Number+S+D

In the case of definite antecedents this is what happens in Mooré, i.e. wnâ occurs at the end of the relative; also, the [+Specific] indefinite determiner nîngâ is inserted after the antecedent (cf. section 3.17 (59a)).

36. The Christaller orthography cannot really handle glides such as those in (60a,b,c). I shall adopt the convention of writing such glides with a high tone over the space immediately following -â. Actually, this problem only arises when such a definitized word occurs in utterance final position, since when followed by another element, the final tone of the glide is elided as well as the nasalization on the vowel (cf. section 3.20 (83)).

37. Note that wnâ will not go through the MSC for suffixes in (20), since it is marked [+Definitizer]; I shall assume that in a fuller form of (20) the segments mentioned are marked [-Definitizer].

38. Adjective phrases with complex noun stems such as those discussed in note 26 pattern with those containing noun stems of type 3 in Table I, e.g. naafô 'cow', but nâg songô (H+H-H₁) 'a good cow' and not *nnâg songô (H+L-H₁). Thus for these special nouns, the underlying suffix in the stem is deleted before ASSIMILATION.
39. For a comment on the segmental shape of the plural suffix in (78i) cf. section 2.2 (7).

40. In many African languages, for example Twi from Southern Ghana, there are tonal differences in possessive constructions depending on whether or not the possessed noun is an alienable or inalienable possession. I have found no such distinction in Moors and so this phenomenon of non-application of stem RAISING is not attributable to this cause.

41. The vowel of the 1st person singular long form is lengthened when it occurs as a complement:

a) mām wàa mé. I came.
b) à pābā mām. He beat me.

This may be due to stress.

42. It is possible that these irregularities along with those noted in conjunction with examples (82) and (83) for noun plus noun possessive constructions may be reflexes of an ancient associative particle such as exists in other Niger-Congo languages, most notably in Bantu. Welmers (1963) has shown evidence of tonal and segmental reflexes for such a particle in several Niger-Congo languages of West Africa. Such reflexes often show up in possessive constructions, though I have not been able to find a systematic correspondence in Moors.

43. Another feature of this group is that, like monosyllabic CV nouns such as kí 'millet' and bá 'father', the definitizer wā does not contract (cf. section 3.17 (59b)), e.g. wàgdá wā 'the thieves', though in the singular, where the suffix vowel elides, contraction does occur, e.g. wàgdá 'the thief'. The nouns that I have found which do not undergo final Vowel ELISION in the plural are: bëndrë, bëndà 'drum(s)'; pëndrë, pëndà 'toad(s)'; kàtrë, kàtà 'hyena(s)'; wàgdë, wàgdà 'thief, thieves'.

I have no explanation for the irregular behavior of these nouns. However, it should be noted that all are complex nouns whose initial tone is low and whose stem ends in the suffix -dV. The plural of bèngré, bèngë 'bean(s)' does not behave this way, e.g. bèngë 'the beans'; nor do complex nouns with the singular suffix -a of the -a/-ba class, e.g. kòosdà, kòosdà 'seller(s)'; kòosdà 'the seller'.

44. The same non-assimilation of low tone occurs after monosyllabic CV nouns like kí 'millet' and bá 'father' and after any word ending in the high tone locative particle ɔ, which never elides.

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45. I have taken the term 'verbal group' from S. Schane's thesis on French Morphology (Schane 1919). He has found that the subject and object pronouns, auxiliary verb, and participle seem to operate phonologically as a unit in French. The same appears to be true for what I have defined as the Verbal Group in Moore.

46. I have had to substitute the low tone verb bâo for wâbe here because all verbs break down into two classes according to how they behave in the imperfective when in serial final position. Those such as bâo exhibit only the imperfective -da (as shown in (105b)), while verbs such as wâbe 'to eat' obligatorily add ë; à wâbda mé, 'He is eating,'; *à bée zâkë h wâbdé, à bée zâkë h wâbdë, 'He is at the compound eating.' Alexandre first noted this (cf. Alexandre, 1953, Vol. I, p. 99).

47. Since the particle ë is always high tone, it presents no problem in terms of explaining its tone or that of the elements which may follow it, i.e. in conjunction with the remarks concerning the tone of -la and short form pronouns; the former is always low and the latter is always high after ë regardless of the tone type of the verb. Therefore I shall not deal with it further in this work.

However, I should point out that its grammatical usage and its meaning are not completely clear to me. It often seems to signify past tense, but it also turns up in certain conditional sentences and, as mentioned in note 46, with the imperfective of certain verbs in final position. In connection with its past tense meaning, note that an identical morpheme ë appears with certain time adverbials and always indicates past time, e.g. dàbîta 'two days from now' versus dâyîte 'two days ago'; dàtàta 'three days from now' versus dàbûtë 'three days ago'; etc. The form of the locative morpheme is also ë, e.g. doôgë 'at / in the house.' It may be that these are all different morphemes with homophonous forms, i.e. as in English where possessive singular of nouns, plural of nouns, and 3rd person singular present tense are all realized as -s; or, on the other hand, there may be some semantic connection between them at the level of deep structure. More work needs to be done in explicating this.

48. The future particle has previously been spelled as nâ (cf. Alexandre, 1953, Vol. I). I am indebted to Frère Jean Baptiste Bukongo for pointing out the presence of the complementizer, which is often difficult to detect in rapid speech.

49. This reduction is accomplished by a different rule (given in (b) below) from that which elides the final vowel
of nominal and verbal suffixes as stated in (35), since the 3rd singular short form pronoun -á never reduces.

Also, the final vowel of -la does not elide to bring about -l. So we must exclude both the complement marker and PRO from undergoing V ELISION. Therefore (35) needs a slight amendment as given in (a) below:

a) \text{V ELISION}

\[
\begin{array}{c|c|c|c|c}
\text{V} & \text{[+BOUND]} & \text{[+SEG]} \\
\text{-NASAL} & \text{-PRO} & \text{-CM}
\end{array}
\]

[+SEG] \rightarrow [-SEG]/(-C)

In (b) below is the rule which reduces the V in short form CV pronouns. I shall presume that it is an early rule.

b) Reduction of the vowel in CV short form pronouns:

\[ V \rightarrow \emptyset/ \ X \ [+BOUND] \ [+PRO] \ [C] \ Y \]

if \( Y = \# \), (b) is optional.

50. This is one among many differences between noun phrases and sentences as complements of verbs which argue against the analysis of sentential complements as being dominated by NP, in Moore at least.

51. Note that certain stative verbs show no perfective aspect in this position. In order to express past time with these verbs the past marker dà must be used, e.g., yàa yàmb, là a mí, 'It's you who knows.' *yàa yàmb la a mí yà, à dà mìi mé, 'He knew.' Other verbs in this class are: dàte 'to want' (which seems to have the imperfective morpheme frozen in its stem); kìse 'to hate'; nò ge 'to like'; tàre 'to have, possess'.

52. After high tone particles like tì, the initial high of òndò 'we' and yàmbà 'you (pl.)' becomes non-automatic downstep: à yèela mé tì yàmb la òooga mé, 'He said that you left.' This does not happen with high-low nouns. I am told by Frère Jean Baptiste Bündkong that in some dialects these pronouns have the tone òndò, yàmbà in isolation. This is probably the source of this otherwise inexplicable irregularity.

53. It is difficult to define or translate precisely the semantic difference between these two types of negatives; the labels 'indefinite' and 'definite' and the translation equivalents in parentheses in the English glosses of (158)
and (159) are at best only approximate. But the notion of 'indefinite' in those negatives with *ya* is perhaps not completely inappropriate because *ya* may be connected with the word for the numeral 'one' and the indefinite determiner 'a', which is *yémRé*, often shortened to *ya*. Alexandre hints at this (cf. Alexandre, 1953, Vol. II, p. 466).

54. Note that in the non-imperfective negative forms, *-a* ~ *-la* has the tone of the aspectless form of the verb, as it does after the future auxiliary *ná n* in section 3.26 (108a) and (114a). This among other features argues quite convincingly for an analysis of the negative as an auxiliary verb which takes an infinitival complement (cf. Part II).
4.0 Introduction to Part II

4.1 The Syntactic Model

The syntactic model used in this sketch of Mooré syntax is essentially that proposed by Noam Chomsky in Aspects of the Theory of Syntax (1965). This work postulates the following parts as comprising the syntactic component of a Generative Grammar: 1) a base component consisting of: a) a set of context free phrase structure rules (PS rules) each of which rewrites an abstract symbol, e.g. S, NP, VP, etc., as a string of one or more abstract symbols and which in sum produce strings of abstract symbols arranged in hierarchies of constituent structure which can be represented as branching tree diagrams such as appear in the sections which follow; b) a lexicon which lists each morpheme in the language in terms of complexes of binary features which indicate the following: its phonological representation (phonological features), its semantic content (semantic features), its grammatical category (syntactic features), its context of occurrence in phrase structure (strict subcategorization features), and for each verb, the types of subjects and complements with which it may co-occur (selectional features); c) a set of lexical substitution rules which insert lexical items into the last line of a phrase structure string; 2) a transformational component consisting of a set
of **transformational rules** (T rules) which convert deep structures emanating from the base component into the various surface configurations of the language through such operations as deletion, addition, permutation, and substitution. I shall not attempt any further explication of the theory outlined above; those who are not familiar with it are referred to the above mentioned work.

For the most part, this book will deal with the phrase structure rules and transformations of Mooré. With the exception of Section 5, where certain syntactic features for verbs which take sentential complements are formulated, I shall not concern myself with matters of the lexicon, though from time to time I shall make reference to such things as strict subcategorization features, selectional features, etc.

4.2 **Abstract Verbs in Syntax**

In the following account of Mooré syntax I shall not attempt a total analysis, but rather I have chosen to concentrate on certain aspects which provide interesting evidence to support a new proposal within the framework of generative linguistics which has been gaining currency in the past two years, namely, the existence of deep structure 'abstract' verbs. The principal works which I have seen and which I shall draw upon as a theoretical base for my analysis are the following: 'On Declarative Sentences' by John Ross (Ross, 1968); *Abstract Syntax and Latin Complementation* by Robin Lakoff (R. Lakoff, 1968); and *Hypersentences*
by Jerry Sadock (Sadock, 1969). Although there is not space here to review all the points made in the above works, perhaps it would be in order to sketch out the place of abstract verbs in deep structure as put forth by the above authors. In doing this, I shall give a general explication without necessarily attributing each point to a specific person.

The original impetus for the development of the notion of abstract verbs in deep structure came from the work of J. L. Austin (Austin, 1965), the noted Oxford natural language philosopher. Austin observed that certain verbs in English, when used in the present tense (and non-progressive aspect) with a 1st person singular subject, seem to be acts in themselves, i.e. the very saying of a sentence with such a verb as the main verb seems to be the performance of an act, e.g.

(1) a) I promise that I will come.
    b) I name this ship 'Mary Jane'.
    c) I say that Harry is an idiot.
    d) I order you to leave.

He also pointed out that it is inappropriate to talk of such sentences as having a truth value. In (1a), for example, it makes no sense to say that it is either true or false that the speaker made a promise. Austin termed such sentences 'performative utterances'. Eventually he came to the conclusion that all utterances are in a sense performative and involve an act of speaking of one sort or another (i.e.
whether it be declaring, or commanding, or requesting, etc.),
though the performative may be only understood, e.g.

(2) a) I will come.

b) Harry is an idiot.

c) Leave!

Austin termed the utterances in (1) 'explicit performatives'
and those in (2) 'primary performatives' (cf. Austin, 1965, p. 69).

Ross and other generative linguists, taking note of
Austin's observations, began to find syntactic arguments in
English and other languages for positing underlying abstract
performative verbs as matrix verbs for normal declarative
sentences as well as questions and imperatives, i.e. 'primary
performatives' in Austin's sense. They found that these
verbs could be added to the deep structure with little change
in the apparatus of the grammar, since they belong to al-
ready existing verb classes and are therefore subject to the
same rules and selectional restrictions, etc.

The existence of such 'hypersentences' as deep struc-
ture matrices for surface spoken utterances provides a
natural explanation for the notions of 'speaker' and 'hearer'
as well as for 1st and 2nd person pronouns. Thus the noun
phrase which is the subject of an abstract performative verb
is defined as the 'speaker' noun (NPₐ) (i.e. it is always
identical to the speaker of the utterance) while the noun
phrase which is complement to an abstract performative is

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defined as the 'hearer' noun \( (\text{NP}_h) \) (i.e. it is always identical to the person to whom the utterance is directed). Thus in (3) below, the uppermost sentence is a hypersentence \( (S_H) \), which contains John as its subject, i.e. 'speaker' noun, Mary as its object noun, i.e. 'hearer' noun, and abstract verb of declaration (the notion of 'abstract' verb will be explained more fully in section 6.2); the lower sentence is embedded as the sentential complement of the abstract verb of \( S_H \).

Any NP in the complement \( S \) which is identical to the 'speaker' NP is automatically pronominalized as a 1st person pronoun and any NP which is identical to the hearer noun is pronominalized as a 2nd person pronoun. Thus the subject of the complement \( S \) in (3) becomes 'I' and the object becomes 'you'; in the surface, \( S_H \) is deleted and the surface sentence becomes 'I love you'. (The subscript symbols \( S_H \), \( \text{NP}_S \) and \( \text{NP}_h \) are merely informal markers used in tree diagrams to indicate special instances of \( S \) and NP; they are not to be taken as separate phrase structure symbols apart from \( S \) and NP.)
(3) is the deep structure (somewhat simplified) for the sentence 'I love you'.

In this account of Moore's syntax I shall concentrate on the following areas: a) classification of verbs that take sentential complements; b) imperative sentences; c) declarative sentences; d) disjunction, conjunction and related structures; 3) reason and purpose adverbials. Some areas, such as pronominalization, will not be explicitly dealt with; others, such as relativization and nominalization, will be analyzed as ancillary to the main points mentioned above.

In general I shall attempt to construct the arguments in support of the existence of abstract verbs from Moore's. Thus the arguments put forward will not necessarily be the same as those advanced for English; in most cases they will be based more on structural points, while those put forward for
English are often based more on semantic grounds. The structural arguments advanced for abstract verbs for imperatives and reason and purpose adverbials, however, are very similar to those discovered by Lakoff for Latin (Lakoff, 1968).

In this chapter, for the most part, I shall mark tone only on certain functional morphemes for which there is a minimal tone distinction, e.g. the complementizers tì and tì. From time to time I may make reference to Part I where the tonal analysis verifies a particular grammatical point which is not evident from the tonally unmarked sentence. Also, in the interest of brevity, when presenting phrase structure trees, I shall often leave out low level non-branching nodes such as V (verb), N (nouns), NOM (nominals), etc.

4.3 Footnotes

1. Robert Hetzron of the University of California at Santa Barbara also proposes deep structure abstract syntax in his forthcoming paper 'The Deep Structure of the Sentence' (Hetzron, 1969). Hetzron's proposals are much more far reaching than those mentioned above and would seem to require greater changes or additions to the apparatus of the grammar, which he does not provide. Thus I have not drawn from his paper, though it is very much in the spirit of deep abstract syntax.

2. It is interesting to note that the germ of the notion of abstract verbs in deep structure can be found in Katz and Postal's Integrated Theory (Katz and Postal, 1964). In explaining the semantic interpretation of Q and Imp(ertative), the somewhat ad hoc trigger morphemes for the question and imperative transformations, they stipulate that these morphemes have a reading such as 'speaker requests an answer to the question...' and 'speaker orders you...', etc.
5.0 Verbs Which Take Sentential Complements

5.1 Syntactic Features of Verbs Which Take Sentential Complementation

In this and the following sections I shall deal with verbs which take sentences as complements and the structural parameters which define the different complement types. By 'sentential complement' I mean sentences which are directly dominated by VP as exemplified by the structure outlined in (4) where $S_2$ is a sentential complement:

$$
(4) \quad S_1
\quad \text{NP} \quad \text{VP} \quad \text{Vb} \quad (\text{NP}) \quad S_2
$$

I realize that this formulation is not in accord with the prevailing analysis of such complements in English where it is assumed that sentences in complement position are always dominated by the node NP, as in example (3) of section 4.2. (Also see Stockwell, Schachter, and Partee, 1968.) It is convenient to make such an analysis in English because in many cases sentential complements behave like normal NPs or sentences dominated by NP in that they undergo many of the same syntactic rules, e.g. that insertion, passive, pseudo-cleft, etc. In Moore, however, there are numerous systematic differences between sentential complements and sentences dominated by NP and almost no similarities. Thus with respect to their internal structure, a)
sentential complements may never contain the particle sê while sentences dominated by NP (i.e. factive nominalizations and relative clauses) must contain it (for a presentation of the rule which inserts sê and a fuller discussion of this type of clause, cf. section 7.6); b) sentential complements must take one of the complementizers tí, tì, or n at the head while sentences dominated by NP never do; c) certain types of sentential complements must contain the particle me after the verb, but sentences dominated by NP never do. Furthermore, I have found no rules which apply to both, for example in cleft sentences only sentences dominated by NP (i.e. containing sê) may be clefted, while those with structural features of sentential complements may not (e.g. cf. (191) in section 9.1). Clauses with the features of sentential complements never appear in subject position, but sentences dominated by NP may appear as subjects or as complements, as (5) below shows:

(5) a) aYamb sê togs solmdâ taa m yam.
   'Yamba's telling the story pleased me.'

   b) m da nonga aYamb sê togs solmdâ.
   'I liked Yamba's telling the story.'

I shall not consider nominalized sentences in complement position such as that in (5b) to be true sentential complements. (Note that the declarative marker me elides when followed by a nominalized sentence, as it does when followed by any NP, but not when followed by a sentential complement (cf. section 3.29).

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Whether or not sentential complements are dominated by NP in deep structure is not crucial with respect to universal grammar, since the presence of an intervening NP node between the S and the dominating VP will not affect the semantic interpretation in any way, i.e. amalgamation rules (as in Katz and Postal, 1964) will not assign a different interpretation; nor does it have serious consequences for the notion of grammatical relations, since the crucial node in defining 'complement of' is VP. Therefore, the introduction of an NP node as dominating sentential complements has surface syntactic consequences but no deep semantic consequences. Thus the analysis in the following pages is not affected in any significant way if sentential complements are analyzed as being dominated by NP. (As for the syntactic features which make mention of S, these would be stated with brackets labelled NP surrounding S.)

Verbs which take sentential complements can be divided into five basic classes (verbs of declaration, command, willing, perceiving, and auxiliaries) according to the following structural parameters in their complements: a) tí versus ì as a complementizer; b) da (subjunctive) versus ka~pa (indicative) as the mark of negation in the complement; c) presence versus absence of the post verbal declarative marker me in the complement and presence versus absence of the perfective aspect. On the basis of these points we can establish three syntactic features which will uniquely specify the above five classes of verbs.
a) \[\text{LOCUTION}\]. Verbs whose complements take \textit{ti} as a complementizer are \[\text{+LOCUTION}\]; this includes true verbs of declaration, e.g. 'say', 'persuade', and verbs of 'mental' declaration, e.g. 'know', 'hope' (cf. section 5.2); and verbs of command, e.g. 'order' (cf. section 5.3). Verbs whose complements take \textit{\textbackslash} as a complementizer are \[-\text{LOCUTION}\]; this includes verbs of willing, e.g. 'want' (cf. section 5.4), verbs of perceiving, e.g. 'see' (cf. section 5.5), and auxiliaries, e.g. 'future' (cf. section 5.6). The \[\text{+LOCUTION}\] group includes all verbs which involve an act of speaking and whose sentential complements are the direct or indirect result of that act.

b) \[\text{REAL}\]. Verbs whose complements take \textit{da} as a mark of the negative are \[-\text{REAL}\], while those whose complements take \textit{ka} in the negative are \[\text{+REAL}\]. Verbs of command and willing belong to the former group and verbs of declaration and perceiving and auxiliaries belong to the latter. I shall postulate that in deep structure the complements of all \[-\text{REAL}\] verbs contain the future auxiliary \textit{na}, which in most cases is deleted in the surface. This accounts for the fact that complements of such verbs can only take future tense adverbs.\(^1\) (This will be dealt with in more detail in section 5.4 below and in section 9.2 on purpose adverbials, where the future auxiliary actually appears in the surface.) Complements of \[-\text{REAL}\] verbs are what I would call 'true subjunctives'.
c) [+INDEPEND]. Sentential complements of [+INDEPEND] verbs contain the post-verbal independent declarative (or indicative?) marker me; the main verb of the complement sentence, provided it is not preceded by an auxiliary, must be marked for aspect, i.e. either imperfective or perfective; complements of [-INDEPEND] verbs do not contain me and their main verbs are never marked for perfective aspect, i.e. they are either imperfective or aspectless. In general, we can say that for the former type the event or idea expressed in the complement is independent of the matrix sentence, while in the latter type the event or idea expressed in the complement is consecutive to or dependent on the expression of the matrix sentence.

As will be shown in a later section, the above features will serve to govern certain transformational rules such as ME INSERTion, Complementizer INSERTion, SUBJunctive NEGative, and others.

In addition to the above-mentioned structural features of sentential complements, there is a fourth parameter which makes a further division within the class of verbs of declaration (and, in the case of one verb, within the class of verbs of willing): presence versus absence of a [+HUMAN] noun object in the VP of the matrix sentence, i.e. three-place versus two-place predicates. I have not created a separate syntactic feature for this parameter, since it is marked by the strict subcategorization feature $^[+\_NP\ S]]$
and the selectional feature $[\pm[\_+[N, +HUMAN]]]$. This will be discussed in the sections on the various verb classes.

5.2 Verbs of Declaration

Complements of verbs of declaration meet the following structural conditions: a) they take tì as a complementizer; b) they take the indicative negative ka; c) they take the post-verbal particle me. Thus we can assign them the following feature representation:

$$
\begin{array}{l}
  +\text{VERB} \\
  +\text{LOCUTION} \\
  +\text{REAL} \\
  +\text{INDEPEND}
\end{array}
$$

The class of verbs of declaration is further divided along the line of three-place versus two-place predicates, as mentioned above in section 5.1. Verbs of declaration which are heads of three-place predicates are those which involve a locutionary act of some sort, e.g. saying, promising, etc., that involves a speaker and a hearer:

(6) a) a yeel b la me tì naabâ ta ta me.

he/tell/them/la/me/that/chief+the/arrived/me.

'He told them that the chief has arrived.'

b) a yeel b la me tì naabâ ka ta ye.

he/tell/them/la/me/that/chief+the/not/arrive/ye.

'He told them that the chief has not arrived.'

(For an explanation of ye and the absence of me cf. section 3.34.)
Some three-place predicate verbs of declaration may appear without NP objects in the surface as indicated in (7):

(7) a) a yeela me tí naabá taa me.
    he/said/me/that/chief+the/arrived/me
    'He said that the chief has arrived.'

    b) a deega me t'a maana me.
    he/admitted/me/that/he/did/me
    'He admitted that he did (it).'

In all such cases there seems to be an understood 'hearer' much like the understood subject of an agentless passive. Thus I shall assume that in sentences like (7) there is an underlying unspecified NP (hearer) object which has been deleted in the surface and that therefore in the Lexicon all verbs which are heads of three-place predicates are marked in the following way with respect to strict-subcategorization features: [+[___NP S]] and [-[___S]].

Verbs of declaration which are heads of two-place predicates and may not fill such a function in three-place predicates (i.e. they are marked [-[___NP S]] and [+[___S]]) involve cogitative and emotive states of mind which we can informally term 'mental processes', e.g. 'knowing', 'hoping', 'thinking', etc., as exemplified in (8):

(8) a) m saagda me tí naabá taa me.
    I/hope/me/that/chief+the/arrived/me
    'I hope that the chief has arrived.'
b) m saagda me tí naabā ka ta ye.
   I/hope/me/that/chief+the/not/arrive/ye
   'I hope that the chief hasn't arrived.'

c) *m saagda naabā t'áj taa me.
   *'I hope the chief to have arrived.'

Complements of verbs of declaration never undergo
EQUI-NP-DEL(ation), a rule which deletes the subject of a
complement S when it is identical to the subject of the
matrix S and inserts the particle n as a connector (cf.
verbs of willing section 5.4 and for formulation of the
rule cf. (52) section 5.10):

(9) a) m yeela me tí mam kula me.
   I/said/me/that/I/left/me
   'I said that I left.'

b) *m yeela me n kula me.

c) m banga me tí mam yāā a la me.
   I/know/me/that/I/saw/him/la/me.
   'I know that I saw him.'

   d) *m banga me n yā a la me.

Below in (10) is a list (not exhaustive) of some common
verbs of declaration which head three-place predicates, i.e.
'true' verbs of declaration:

(10) vèele: 'to tell/say (to someone) that...

tóogè: 'to convince/persuade someone of
   something'

\[\text{\textless} veene: 'to swear (to someone) that...'

kābè: 'to promise (someone) that...'

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\[ \text{'to admit (to someone) that...'} \]
\[ \text{'to remind someone that...'} \]
\[ \text{'to ask (someone) if...'} \]
\[ \text{'to show/indicate (to someone) that...'} \]

In (11) is a list of verbs of declaration which are heads of two-place predicates, i.e. 'mental' verbs of declaration:

(11)

\[ \text{'to hope'} \]
\[ \text{'to believe/think'} \]
\[ \text{'to know'} \]
\[ \text{'to doubt'} \]
\[ \text{'to imagine'} \]
\[ \text{'to guess'} \]
\[ \text{'to remember'} \]
\[ \text{'to understand/hear'} \]
\[ \text{'to indicate' (with a factive nominalization as subject, cf. section 9)} \]
\[ \text{'to mean' (with a factive nominalization as subject, cf. section 9)} \]

5.3 Verbs of Command

Verbs of command take complements which meet the following structural conditions: a) \[ \text{tí} \] as a complementizer; b) \[ \text{da} \] as the mark of negation; c) obligatory absence of the particle \[ \text{me} \]. Verbs of command have the following feature representation:

\[
\begin{array}{c}
\text{[+VERB} \\
\text{+LOCUTION} \\
\text{-REAL} \\
\text{-INDEPEND} \\
\end{array}
\]

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(12) below presents some examples of verbs of command:

(12) a) m saagl aɁ la me t'Ɂ aɁ kuli.
   I/advised/himɁ/la/me/that/heɁ/leave.
   'I advised him to leave.'

       b) m saagl aɁ la me t'Ɂ aɁ da kul ye.
       I/advised/himɁ/la/me/that/heɁ/not/leave/ye
       'I advised him not to leave.'

c) a yeel m la me t'm kuli.
   he/told/me/la/me/that/I/leave.
   'He told me to leave.'

d) a yeel m la me t'm da kul ye.
   he/told/me/la/me/that/I/not/leave/ye
   'He told me not to leave.'

As with complements of verbs of declaration, complements of verbs of command do not undergo EQUI-NP-DEL and thus (13) below is unacceptable as a reduction of (12c), though it could have the meaning 'He told me and (then he) left,' where the two sentences are interpreted as being conjoined and the subject of kuli is identical to that of yeel (cf. dependent conjunction section 7.1).

(13) *a yeel m la me n kuli.

Unlike verbs of declaration, verbs of command are not divided along the parameter of three-place versus two-place predicates. Though a few may occur in two place predicates (cf. 14 below), there are none which may not occur in three place predicates and therefore all are [+NP S]].
(14) a yeela me tí fo wa.
he/said/me/that/you/come

\{'He said for you to come.'
\{'He said that you should come.'\}

Below in (15) is a list of some common verbs of command:

(15) yèele: 'to tell (someone) to do something'
tòòge: 'to persuade/convince someone to do something'
sàgle: 'to advise someone to do something'
kèenge: 'to urge/encourage someone to do something'
pèdje: 'to insist on someone's doing something'
dìдже: 'to press someone to do something'
kòse: 'to ask someone to do something'
chège: 'to remind someone to do something'
kò noore ('give word'): 'to give an order (to someone) to do something'
kò sore ('give road'): 'to give permission (to someone) to do something'
dìgi: 'to forbid someone to do something'
chèdge: 'to prevent someone from doing something'

5.4 Verbs of Willing

The complements of verbs of willing meet the following structural conditions: a) tì as a complementizer; b) da as a mark of negation; c) absence of me (cf. 16). The feature representation for verbs of willing is:

\[
\begin{array}{c}
\text{+VERB} \\
\text{-LOCUTION} \\
\text{-REAL} \\
\text{-INDEPEND}
\end{array}
\]
(16) a) a data me ti fo kuli.
   he/want/me/that/you/leave
   'He wants you to leave.'

b) a nonga me ti fo maan woto.
   he/like/me/that/you/do/thus
   'He likes you to do that.'

c) a data me ti fo da kul ye.
   he/want/me/that/you/not/leave/ye
   \{' He wants that you not leave.' \}
   \{' He wants you not to leave.' \}

d) a nonga me ti fo da maan woto ye.
   he/like/me/that/you/not/do/thus/ye
   'He likes you not to do that.'

Complements of verbs of willing, unlike those for verbs of declaration and command, undergo EQUI-NP-DEL when the subject of the complement is identical to that of the matrix. When the subject of the complement is deleted, the identical subject connector \( \hat{n} \) is inserted.

(17) a) m data me n kuli.
   I/want/me/to/leave
   'I want to leave.'

b) *m data me ti mam kuli.

In some dialects the distinction between indicative and subjunctive negation is not maintained in infinitival complements and only the indicative negative ka appears (e.g. Yako), while in others either may be used (e.g. Gilungu):

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(18) a) \((G,Y)\) m data me n ka kul ye.
I/want/me/to/not/leave/ye
'I want not to leave.'
b) \((G)\) m data me n da kul ye.
I/want/me/to/not/leave/ye
'I want not to leave.'

For the most part, verbs of willing occur only in two place predicates. Below in (19) is a list of the verbs of willing which I have found. They do not seem to be as numerous as other classes.

(19) \(\text{dâ'ê}: \ 'to want'}\)
\(\text{tûlge}: \ 'to desire'}\)
\(\text{nûnge}: \ 'to like'}\)
\(\text{tûge}: \ 'ought to; it is necessary that...'\)
\(\text{sêgê}: \ 'to be suitable, to be right that'}\)
\(\text{yîle}: \ \text{purpose verb (cf. section 9.2)}\)
\(\text{modge}: \ 'to try; to force someone to do something'}\)
\(\text{make}: \ 'to try'}\)
\(\text{tê}: \ 'to be able; can'}\)

The only verb of willing that I have found which may be the head of a three place predicate is modge. When it acts in this function it has the sense of 'to force someone to do something'; as head of a two place predicate it glosses as 'to try', e.g.

(20) a) m modg a₁ la me t'a₁ kuli.\(^6\)
I/forced/him₁/la/me/that/he₁/leave
'I forced him to leave.'
b) m modga me n kuli.
    I/ tried/me/to/leave
    'I tried to leave.'

The last two verbs in (19), make and tõe, obligatorily undergo EQUI-NP-DEL and therefore appear only with infinitival complements.

(21) a) a maka me n kuli. (*a maka me tì fo kuli.)
    he/ tried/me/to/leave
    'He tried to leave.'

b) a tõee-me n kuli. (*a tõee me tì fo kuli.)
    he/is able/me/to/leave
    'He can/ is able to leave.'

I shall assume that they belong to the class of verbs of willing, since their complements undergo EQUI-NP-DEL, do not contain me, and express the same futurity or 'unreality' of sentential complements of [-REAL] verbs as discussed below in examples (24) and (25).

Verbs of willing with sentential complements which have undergone EQUI-NP-DEL are subject to an optional rule called ME-TRANSPORTation which moves the declarative particle me from the matrix S to the same position in the constituent S (cf. (54) in section 5.10 for the actual form of the rule), e.g. (17a) and (21b) have the optional form of (22a) and (22b) respectively. As (22c and d) show, ME-TRANSPORT may reapply and move me indefinitely far down in an embedded series as long as the conditions are met.
(22) a) a dat n kula me.
    he/wants/to/leave/me
    'He wants to leave.'

b) a töe n kula me.
    he/is able/to/leave/me
    'He can/is able to leave.'

c) a dat n maka me n kuli.
    he/wants/to/try/me/to/leave
    'He wants to try to/and leave.'

d) a dat n mak n kula me.
    he/wants/to/try/to/leave/me
    'He wants to try to/and leave.'

As far as I can determine, sentences like (21b) and (22b) are full paraphrases of each other. We shall see in the section on conjunction that conjoined VPs are also subject to ME-TRANSPORT (cf. (76), section 7.1).

Note that ME TRANSPORT does not operate when the verb complement is unreduced, e.g. (16a) above does not have a paraphrase like (23):

(23) *m dat ti fo kula me.

nor does it operate when there is a complement in the matrix sentence which intervenes between the infinitival complement and the matrix verb, e.g. (24a) does not have a paraphrase like (24b); but presence of a complement in the constituent S does not block ME TRANSPORT, as (24c) and (24d) show.

(In (24a) and (24d) me is elided according to the principles
put forward in section 3.29 and section 3.30 (140)).

(24) a) a data nemd n wābe.

'He wants meat to eat.'

b)*a dat nemd n waba me.

c) a data me n wāb nemdo.

'He wants to eat meat.'

d) a dat n wāba nemdo.

'He wants to eat meat.'

As mentioned in section 5.1(b), complements of verbs which are [-REAL] can only take future adverbs. This is most likely a universal fact. Thus the acceptability of the English translations of the Mooré sentences in (25) and (26) exactly parallels the acceptability of the Mooré sentences.

(25) a) a na n kula bëogo.

he/is going/to/leave/tomorrow

'He is going to leave tomorrow.'

b)*a na n kula zaamē.

'He is going to leave yesterday.'

(26) a) m data me t'a kul bëogo.

I/want/me/that/he/leave/tomorrow

'I want him to leave tomorrow.'

b)*m data me t'a kul zaamē.

'I want him to leave yesterday.'

I shall posit that complements of [-REAL] verbs contain the future auxiliary nem and that with one exception this is deleted in the surface (cf. section 9.2 on purpose
adverbials). Thus the deep structure for (26a) would be that in (27).

(27)

\[
\begin{array}{c}
S_1 \\
NP \quad VP \\
m \quad Vb \\

\text{dat} \\
\text{[LOCUT]} \\
\text{-REAL} \\
\text{-INDEP} \\
S_2 \\
NP_1 \quad VP \\
\text{a} \quad Vb \\

\text{na} \\
\text{[LOCUT]} \\
\text{[REAL]} \\
\text{-INDEP} \\
S_3 \\
NP_1 \quad VP \\
\text{a} \quad Vb \\
kuli \quad \text{TIME} \\
\text{bego} \\
\end{array}
\]

(For an explanation of the features on na in S₂, cf. section 5.6.) After EQUI-NP-DEL deletes the subject of S₃, a later rule will delete na (cf. section 9.2 (219)). The same analysis applies to complements of verbs of command.

Verbs of willing may also take sentences as complements in the form of action nominals, which as far as I can determine have the same meaning as sentential complements. Thus (28a) has the same meaning as (16a), and (28b) has the same meaning as (17a):

(28) a) m data fo kulbu.

I/want/your/leaving

'I want you to leave.'

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b) m data kulbu.

I/want/leaving

'I want to leave.'

Verbs of willing are the only class of sentential complement verbs which may consistently take action nominals as an alternative form to sentential complements. 10

5.5 Verbs of Perception

This is a very small class of verbs; I have found only two members (though there may be more): yą' 'to see' and mīke 'to perceive/find that...'. Sentential complements of verbs of perceiving have the following structural characteristics: a) they take tì as a complementizer; b) they take the indicative negative ka~pa; c) they take the declarative particle me. Verbs of perceiving are heads of two place predicates and so are marked [+__S]. In accord with the features established above, they have the following specification:

\[
\begin{array}{c}
\text{[-LOCUTION]} \\
\text{+[REAL]} \\
\text{+[INDEPEND]} \\
\end{array}
\]

Below in (29) and (30) are some sentences which exemplify these points:

(29) a) m mīka me t'ā looga me.

I/noticed/me/that/he/when/ME

'I noticed that he had left.'

b) m yāa me tì naabā waa me.

I/saw/me/that/chief + the/came/ME

'I saw that the chief had come.'

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(30) a) m mìka me t'ër pa loog ye.
     I/noticed/me/that/he/not/leave/ye
     'I noticed that he hadn't left.'

     b) m yàa me tì naabà pa wa ye.
     I/saw/me/that/chief + the/not/come/ye
     'I saw that the chief hadn't come.'

Complements of verbs of perceiving do not undergo EQUI-NP-DEletion:

(31) a) m mìka me t'ém mensa m sùugà.
     I/noticed/me/that/I/lost/my/knife/
     'I noticed that I (had) lost my knife.'

     b) *m mìka me n mensa m sùugà.

5.6 Auxiliary Verbs

There is a group of verbs, which I shall call 'auxiliaries', which take sentential complements that obligatorily undergo EQUI-NP-DEL, i.e. like make 'to try' and tòe 'to be able' (cf. section 5.4 (21)). In addition, unlike make and tòe, they obligatorily undergo ME TRANSPORT and so, in sentences with auxiliaries, me always appears in the constituent S and never in the matrix S, e.g.

(32) a) a tol n kula me.
     he/already/n/leave/me
     'He has already left.'

     b) *a tola me n kuli.

(I shall claim that (32a) has the form of (32b) before ME TRANSPORT.) As in complements of [-INDEPEND] verbs, the
verb in the complement clause of an auxiliary verb is never marked for perfective aspect (e.g. cf. section 3.32). With respect to the negative, which is itself an auxiliary verb (cf. note 11 below), some auxiliaries only permit the negative to precede them (e.g. (33a) and (33b)), while others permit the negative to precede or follow with no difference in meaning (e.g. (33c) and (33d)); but the negative is always indicative.

(33) a) a pa tol n kul ye.
   he/not/at all/n/leave/ye
   'He didn't leave at all.'

b) *a tol n pa kul ye.

c) a pa va n kul ye.
   he/not/in the end/n/leave/ye
   'In the end he didn't leave.'

d) a va n pa kul ye.
   he/in the end/n/not/leave/ye
   'In the end he didn't leave.'

On the basis of these points I shall assign the following feature representation to auxiliaries:

\[-\text{LOCUTION} \ 
+\text{REAL} \ 
-\text{INDEPEND} \]

The specification of \[-\text{LOCUTION}\] predicts that if there were an auxiliary with a sentential complement that did not undergo EQUI-NP-DEL, i.e. with a non-identical subject, the complementizer for the complement would be \text{ti}. In fact, there are two verbs (and there may be others) whose
complements do not undergo EQUI-NP-DEL and meet all the structural conditions of the above feature specification: a) ti as a complementizer; b) indicative negative; c) lack of me and perfective aspect. These verbs are: kite 'to bring it about that...; to act such that such and such happens' (i.e. a more indirect causation than that expressed by modge in section 5.4 (20a)); and sâke 'to let it be that...; to let it happen that...; to accept that...'

(34) a) a kita me t`b kuli.

he/brought it about/me/that/they/leave.

He brought it about that they left.'

b) a kita me t`b pa kul ye.

he/brought it about/me/that/they/leave

He brought it about that they didn't leave.

I shall consider these verbs to belong to the class of auxiliaries.

Some verbs which appear as auxiliaries may also function alone as main verbs, in which case they have a different and often seemingly unrelated meaning, e.g. zoe means 'to run' in (35a), while in (35b), where it functions as an auxiliary it glosses as 'already'. Auxiliaries like tole in (33) cannot occur independently, as (35c) shows.

(35) a) a zoe me.

he/ran/me

'He ran.'
b) *a tola me.

There are some auxiliaries which are in the process of becoming simple pre-verbal particles and may optionally occur without the complementizer n, though in all other respects the verb which follows it still behaves like a complement verb, i.e. it is unmarked for perfective. Usually this happens with CVC auxiliaries ending in a voiced stop where the final consonant may optionally be truncated; the dropping of the complementizer is obligatory with the truncated variant:

(36) a) m nij n wābda nemdo.

'I sometimes eat meat.'

b) m ni wābda nemdo.
'I sometimes eat meat.'

c) *m ni n wābda nemdo.

Note that the negative verbs ka~pa and da belong to the class of auxiliary verbs, but they never occur with the complementizer n, though, as with other auxiliaries, the following verb is always unmarked for perfective.11

In (37) below is a list of verbs which appear exclusively as auxiliaries and have no independent meaning:
(37) tòle: 'already'
  pùd ~ pùs: 'even (so); 'at all (with the negative)'
  kèlè: 'even (so); 'at all (with the negative)'
  tìg ~ tì ~ tìg ~ tì: 'go'
  nìb ~ nì ~ yìb: 'sometimes'
  bùl: 'naturally; besides'
  pìnè: 'soon'
  nà: 'will, to be going to'
  sà ~ sàg: 'if'
  véa ~ vé ~ vèg ~ vé ~ fèg ~ fè: 'at least, nevertheless'; 'provided that...
  kìte: 'to bring it about that'

With respect to strict-subcategorization features, the above verbs are marked \[+[-\_S]], \[-[\_NP]], \[-[\_#]\], i.e. they obligatorily take an S complement.

In (38) is a list of verbs which have an independent verbal meaning, given in parentheses, as well as an auxiliary meaning.

(38) kòdè ('to turn around'): 'immediately afterward'
  lèdè ~ lèbè ~ lè ('to return, come back'): 'again'
  tare ('to have'): 'to be used for doing something'
  kète ('to be present'): 'still'
  zòe ('to run'): 'already'
  vè ('to be tired'): 'finally, at last, in the end'

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`goode` ('to walk'): 'often'
`denge` ('to be first'): 'first of all, in the first place, before hand'
`ì` ('to know, i.e. connaître'): 'customarily, usually'
`sìng` ('to begin'): 'a long time ago'
`káose` ('to be late, wait a long time!'): 'to take a long time in doing something; to do something for a long time'
`yàoale` ('to end up'): 'then, next'
`wà` ('to come'): future tense in certain contexts
`pà~kà/dà` ('to be not'): 'not'
`sàkè` ('to obey'): 'to let it be that...

It is interesting to note that Mooré uses auxiliary verbs to express many meanings which are rendered by 'auxiliary' adverbs in Indo-European languages; even the word 'if' is expressed by a special auxiliary verb sà(g), which appears as the matrix verb for all conditional clauses (e.g. cf. (b) of note 3 in section 5.11). In many cases it is difficult to translate these auxiliaries precisely; the above translations may not be completely appropriate in every case. (For a recent analysis of English auxiliaries as main verbs cf. Ross, 1969.)

5.7 Summary of the Syntactic Features for Verbs Which Take Sentential Complements

Below is a table which summarizes the values of the features established in section 5.1 with respect to the
various verb classes discussed above. Feature values which are in parentheses are redundant and predictable by the lexical redundancy rules in (39).

<table>
<thead>
<tr>
<th></th>
<th>true declaration</th>
<th>mental</th>
<th>command</th>
<th>willing</th>
<th>(modge) direct cause</th>
<th>perceiving</th>
<th>auxili-</th>
<th>ary</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCUTION</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>REAL</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>INDEPEND</td>
<td>(+)</td>
<td>(+)</td>
<td>(-)</td>
<td>(-)</td>
<td>(-)</td>
<td>+</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>[___NP S]</td>
<td>+</td>
<td>(-)</td>
<td>+</td>
<td>(-)</td>
<td>+</td>
<td>(-)</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>[___S]</td>
<td>(-)</td>
<td>+</td>
<td>(-)</td>
<td>+</td>
<td>(-)</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

(Note that the above table assumes that true verbs of declaration and verbs of command obligatorily belong to three place predicates in deep structure, cf. section 5.2.)

In (39) are the lexical redundancy rules (cf. Chomsky, 1965, p. 164) implied by the parentheses in the above table.

(39) a) [-REAL] → [-INDEPEND]

b) [+LOCUTION]
   [+REAL] → [+INDEPEND]

c) [+[___NP S]] → [-[___S]]

d) [+[___S]] → [-[___NP S]]

(39a) states that all verbs which are [-REAL] are [-INDEPEND] (i.e. verbs of command and willing); (39b) states that verbs which are [+LOCUTION] and [+REAL] are [+INDEPEND] (i.e. verbs of declaration, 'true' and 'mental'); (39c) states that verbs marked plus for the three place predicate feature are marked minus for the two place predicate feature and (39d)
states that verbs marked plus for the two place predicate are marked minus for three place predicate. Note that if it weren't for the class of auxiliaries, the features [REAL] and [INDEPEND] could be collapsed into a single feature, since, with the exception of auxiliaries, any verb which is [−REAL] is [−INDEPEND] and vice versa.

What are we to say about the status of the above features with respect to universal grammar? Certainly the strict subcategorization features for two and three place predicates are to be found in all languages, since it would be difficult to imagine a human language without this distinction. As to the three syntactic features, I am not prepared to make any claims about the universality of these features as syntactic features, although it seems quite likely that the verb classes which they define can be recognized at one level or another, i.e. semantic or syntactic, in most languages.

For example, it is interesting to note that, excluding auxiliaries, which may or may not universally be verbs, the following can be observed: 1) the class of verbs in Mooré which are [−REAL] (and [−INDEPEND]) coincides in general meaning with: a) that class of Latin verbs whose sentential complements take the complementizer ut plus the subjunctive mood and ne as a negative marker; b) that class of French verbs whose sentential complements take the subjunctive; c) that class of English verbs whose sentential complements
undergo EQUINPDELETION; 2) the class of Mooré verbs which are [+REAL] (and [+INDEPEND]) coincides in meaning with that class of verbs in English whose complements take the pluperfect when the verb of the matrix sentence is past and the verb of the complement contains the perfective, e.g. 'I told them that he had finished,' 'I knew that he had finished,' 'I saw that he had finished.'

Finally, in comparing the lists of verbs which make up the various classes discussed in the preceding sections, it can be seen that the same verb may turn up in more than one class, e.g. yeele 'to say' is listed as both a verb of declaration and as a verb of command. I shall assume that for a verb which belongs to more than one meaning class the value of any of its syntactic, strict subcategorization features etc. may shift according to the meaning which is chosen. In the case of yeele, it is the features [REAL] and [INDEPEND] which shift. In short, 'syntactic' and even strict subcategorization features can be considered as inextricably bound up in the 'meaning' of a verb.

5.8 Stative versus Non-Stative Verbs

Before going on to formulate phrase structure rules and transformations there is one other syntactic/semantic feature of verbs which ought to be mentioned: [+STATATIVE]. This feature describes a division which is probably marked in one way or another in all languages and applies to all verbs, not just those which take sentential complements.
[+STATATIVE] verbs are restricted with respect to aspect: they may not occur with the imperfective and many are never specified for aspect at all (cf. section 3.37 note 51); [-STATATIVE] verbs are not restricted with respect to aspect. Included in the former group are most 'adjectival' verbs (cf. section 3.14) as shown in (40a) and (40b); (40c) and (40d) show a non-stative verb.

(40) a) a miísá me.
   it/sours/me
   'It is sour.'

b) *a miísda me.
   '*It is being sour.'

c) a yũu me.
   he/drank/me
   'He has drunk./He drank.'

d) a yũuda me.
   he/is drinking~drinks/me
   'He is drinking/He drinks.'

Another structural factor which divides the two types of verbs is that action (and manner) nominals may be formed from non-stative verbs, but never from stative verbs (cf. section 3.9 and section 5.11, note 10).

(41) a) *a miisgu/-bu/-re...
   '*Its souring...'

b) a yũubu...
   'His drinking'
(Abstract nouns (cf. section 3.13) may be formed from stative verbs, e.g. *miism 'sourness' but not from non-stative verbs, e.g. *yūum 'drinkingness'.)

With respect to the classes of verbs which take sentential complements as defined in the preceding sections, 'true' verbs of declaration, verbs of command, and the direct cause verb *modge 'to force' are all [-STATIVE], while 'mental' verbs of declaration, verbs of willing, verbs of perceiving, and auxiliaries are [+STATIVE].

It can be seen, then, that all sentential complement verbs which are heads of three place predicates are [-STATIVE]. By revising the redundancy rule for three place predicates in (39c) to that in (42), we can include this fact in our lexical redundancy statements without adding a new rule.

\[ (42) \ [+[\_\_NP \ S]] \rightarrow \ [-[\_\_S]] \]

At the same time, with the exception of the two verbs mentioned in note 14, sentential complement verbs which are heads of two place predicates are [+STATIVE]. This is captured in the revision of (39d) shown in (43) below:

\[ (43) \ [+[\_\_S]] \rightarrow \ [-[\_\_NP \ S]] \]

As we shall see in section 6, the feature [+STATIVE] is useful in specifying the notion 'performative verb'.

5.9 Simple Phrase Structure for Sentential Verb Complements

Let us now formulate a set of phrase structure rules which will generate a deep constituent structure for
sentences with sentential complements, and simple transitive
and intransitive sentences as well. In section 7 these rules
will be expanded to include conjunction, disjunction, and
factive nominalization. The first rule (PS1) is the expan-
sion of the initial symbol S (sentence) into obligatory NP
and VP, i.e. subject and predicate.

(44) PS1) S → NP VP

The second rule (PS2) expands VP into obligatory Vb
(verb group) and optional NP, i.e. object, optional S,
i.e. sentential complement. If only NP is chosen, a normal
two place transitive predicate results; if neither NP nor S
is chosen, a one place intransitive predicate results; if
NP and S are chosen, a three place predicate with sentential
complement results; and if only S is chosen, a two place
predicate with sentential complement results. Later on, the
expansion of VP will be revised to include certain adverbs.

(45) PS2) VP → Vb (NP) (S)

The expansion of NP (PS3a and b) is a recapitulation
of that given in Part I (cf. section 3.16 and note 35 of
section 3.37). It provides for simple NPs which contain a
noun, as well as those containing a relative clause. The
phrase structure for NP will later be revised to include
factive nominalizations and phrasal conjunction (cf. section
7.6). Note that in the expansion of NOM either a noun plus
number (N NUM) is chosen or optional NOM plus obligatory S
is chosen. In the latter case, if NOM plus S is selected,
a relative clause results; if only S is chosen, an action
nominal results. (Cf. note 10 in section 5.11 for further
comments on action nominals.) By expanding NOM into NOM+S
and then expanding the second NOM as just S, e.g.

\[
[ \begin{array}{c}
N P \\
N O M \ \\
N O M \\
N O M \\
N O M \\
N P
\end{array} ] \]

we get a relative clause on an action nominal, a construction
which does not occur with factive nominalizations; if we ex-
and NOM as NOM+S twice, 'stacked' relative clauses result,
e.g. cf. section 7.6 (136). As for D (determiner), I shall
not formulate an expansion for this part of NP in the present
work. It is assumed that this category includes: qualifiers,
such as the definitizer wâ 'the' (cf. section 3.17), the
indefinite ayémre ~ ø 'a', and nìngà 'a certain'; \textsuperscript{15} quanti-
fiers such as the cardinal numbers, fã 'all' etc.; and the
demonstrative kàngé 'this/that'.

(46) PS 3a) \(NP \rightarrow \text{NOM D}\)

PS 3b) \(\text{NOM} \rightarrow \{\text{N NUM} \mid (\text{NOM}) S\}\)

Finally, the expansion of Vb (PS \(4a,b,c\)) is essentially
that given in section 3.23 (102), though I have added an
optional T (tense), which expands into past tense da(g),\textsuperscript{16}
or emphatic future/optative particle nà (cf. note 9, section
5.11). Since Mooré is basically an aspectual language, tense
does not play an important role, in the surface at any rate,
and so I shall not deal with it further in this work.\textsuperscript{17}
ASP (aspect) expands into I (imperfective) or P (perfective)

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(cf. section 3.25 for the former and section 3.32 for the latter); ASP is optional, since stative verbs are generally not marked for it (cf. note 51, section 3.37). For comments on the particle ő cf. note 47, section 3.37.

\[(47)\] FS 4a) Vb $\rightarrow$ (T) V (ASP) (ő)

FS 4b) T $\rightarrow$ \[
\begin{cases}
\text{da(g)} \\
\text{nà}
\end{cases}
\]

FS 4c) ASP $\rightarrow$ \[
\begin{cases}
1 \\
F
\end{cases}
\]

5.10 T Rules for Sentential Verb Complements

Before formulating transformations for the base structures generated by the phrase structure rules in the preceding section, let me present certain conventions that are used:

a) All variables in the structural description (SD) of a rule are represented as X, though each instance of X is to be taken as independent of all other instances and no identity is implied by the identity of symbols, unless specifically stated (this convention is taken from Stockwell, Schachter, Partee, 1968);

b) The numbered lines under elements and groups of elements in the SD represent the units operated on and referred to in the structural change (SC);

c) Lines lettered with small letters written over selected elements of the SD mark units which are referred to in conditions which may restrict the rule, such as identity conditions, etc.
d) Unless otherwise stated, the scope of a variable (X) which separates two non-variables in the SD of a T rule does not extend upward or downward over 'sentence boundary', where 'sentence boundary' is represented by the node S or by the node Σ, when S is dominated by Σ (for an explanation of Σ, see section 7.4); this convention means that in an SD any two non-variables (which includes labelled brackets) which are separated by a variable are in the same sentence (for an equivalent convention cf. Postal, 1971, p. 114, on Abbreviatory Variables);

e) The symbols '>' and '<' used in the statement of conditions have the respective meanings '...weakly (i.e. indirectly or directly) dominates within the same sentence...' and '...is weakly dominated within the same sentence by...'; the addition of a bar over either one means direct domination only, i.e. '⇒' and '⇐'; a slash through any of the above indicates its negation, e.g. $\not\Rightarrow$ = '...does not dominate...';

f) All rules not specified as optional are obligatory;

g) All T rules are ordered, though ordering will be specifically noted only when it is crucial for a proper operation of the grammar (the final ordering is presented in section 10);

h) Many of the T rules in this work appear to directly introduce lexical items, e.g. me in ME INSERT (48);
since it has been shown in Stockwell, Schachter, and Partee (1968) that it is more satisfactory to say that such elements are introduced by T rules only as abstract feature complexes to which a phonological shape is attached in a 'second lexical lookup', it is to be assumed in this work that elements with the shape of actual lexical items which are introduced by T rules are simply convenient abbreviations for complexes of features, the actual phonological representation being inserted after all T rules have applied.

Note that in the T rules which follow there is frequent use in the SDs of non-paired brackets (i.e. the use of a right bracket without mentioning the corresponding left bracket and vice versa); the scope of such brackets with respect to other non-variables in the SD is always interpretable by application of the convention in (d) above. For example, in the rule ME INSERT (48, below) the right bracket ] is interpreted as dominating both S brackets as well as the [+INDEPEND] verb, since it is shown to dominate the right bracket ] which by (d) is paired with the left bracket [ which is in turn placed by (d) in the same S as the [+INDEPEND] verb. Also note that in conditions, reference may be made to a bracket as dominating or not dominating a particular element; this is to be interpreted as meaning the entire constituent represented by that bracket. For example, in (48) the condition on ] refers to the entire Vb of that particular S.

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Most of the rules presented in this section are cyclic rules which apply to sentential complements of verbs; in many cases the rules make use of the features defined in the previous sections as 'triggers'.

The first rule, ME INSERT, attaches the post verbal particle me as the last element of the verbal group of the sentential complement of a [+INDEPEND] verb; it affects complements of verbs of declaration ('true' and 'mental', cf. section 5.2) and perceiving (cf. section 5.5).

(48) ME INSERT

\[
\begin{array}{c}
\text{SD: } X [+\text{VERB}] \ X [X] \ X \ X \Rightarrow \\
\text{[+INDEPEND]} \ S \ Vb \ S \ Vp \\
\hline
1 \quad 2
\end{array}
\]

SC: 1+me, 2

Conditions: a \neq \text{\^e}

The condition on ME INSERT prevents its operation in case the indefinite negative particle \^e is present. \^e and me are mutually exclusive, cf. the remarks following (159) in section 3.34. At this point the above rule will account for

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the presence of me only in verb complements, but as is shown in section 6.2, by postulating an abstract performative verb, it will also account for the presence of me in matrix sentences. Note that the VP bracket on the right of the SD is necessary in order to limit ME INSERT to verb complements, since me never occurs in nominalizations, relative clauses, and other subordinate sentences dominated by NP (cf. section 7.6 and point (c) following (4) of section 5.1).

TI INSERT, in (49) below, attaches the complementizer ti at the head of the subject NP of sentential complements of [+LOCUTION] verbs. (As mentioned in section 3.33 following example (155), in the surface ti is included within the NP which follows it.) This affects complements of verbs of declaration ('true' and 'mental', cf. section 5.2) and verbs of command (cf. section 5.3).

(49) TI INSERT

SD: \[ X [ +VERB \\
     +LOCUTION ] X [ [ X ] ] X \Rightarrow \\
     S \ NP \ S \ VP \]

1

2

SC: 1, ti+2

---

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The rule in (50), SUBJUNCT NEG, introduces the subjunctive negative da' as the mark of negation in complements of [-REAL] verbs. I shall assume that ka~pa, the indicative negative, is inserted in the lexical look up and that it is replaced by SUBJUNCT NEG. This affects complements of verbs of command (cf. section 5.3) and verbs of willing (cf. section 5.4). It will be shown in later sections (cf. 6.3 and section 9.2) that if we accept the notion of abstract verbs, this same rule will account for the presence of da' as a negative marker in imperatives and purpose adverbials.

(50) SUBJUNCT NEG

\[
SD: \ x \ [+\text{VERB}] x \ [\ x \ [\ \text{ka} \ x] \ ] \ x \Rightarrow \\
\text{[[-REAL]]} \ s \ v \ s \ vp \\
1 \ 2 \ 3
\]

SC: 1, da', 3

\[
\text{X} \\
\text{VP} \\
\text{Vb} \ x \ X \ S \ NP \ VP \\
\text{[[-REAL]]} \\
\text{V} \ x \ X \ NP \ VP \\
\text{ka} \ ye \\
\text{da'}
\]

The next rule, P DEL, accomplishes the deletion of the perfective aspect (P) from complements of [-INDEPEND] verbs, which includes verbs of command, (cf. section 5.3), willing
(cf. section 5.4), and auxiliaries (cf. section 5.6). Actually, since it is hypothesized that the complements of the latter two types of verbs contain the future auxiliary ná, (cf. (27) in section 5.4), the lack of P in these complement types is traceable to this source, i.e. ná is aspectless and probably P is not generated in the complement of ná although if it were it would be deleted by this rule because ná is itself [-INDEPEND]. At this point, then, P-DEL is primarily for complements of aspectless auxiliaries such as tol 'already' whose complements seem to contain the meaning of perfective but no mark of it in the surface (e.g. cf. (32) in section 5.6). As we shall see in section 7.1 and section 7.2 (cf. the remarks following (87)), the scope of P-DEL will be widened to include non-initial conjoint Ss in dependently conjoined series. (For a final version of the rule, see section 10.)

(51)  P DEL

\[
\begin{array}{c}
SD: X [+VERB \ \mathbf{[-INDEPEND]} ] X [X \ P \ X] \ X \ \Rightarrow \\
\qquad \mathbf{S} \ \mathbf{S} \ \mathbf{VP} \\
\hline
1 \qquad 2 \qquad 3 \\
SC: \ 1, \ \emptyset, \ 3
\end{array}
\]
The EQUI-NP-DELETion rule is stated in (52). This deletes the subject of sentential complements of [-LOCUTION, -INDEPEND] verbs when they are identical to the subject of the matrix sentence and inserts the infinitive complementizer \( \hat{n} \); it affects complements of verbs of willing (cf. section 5.4), which includes modge, the verb of direct cause (cf. note 6, section 5.11), and auxiliaries (cf. section 5.6). Since TÍ INSERT has already applied to sentential complements of all [+LOCUTION] verbs, we need mention only the feature [-INDEPEND] because the presence of \( \hat{t} \) at the head of the subject NP of complements of [+LOCUTION] verbs will prevent them from meeting the identity condition on EQUI-NP-DEL. By specifying [-INDEPEND] we exclude complements of verbs of perceiving (cf. section 5.5).
(52) EQUINP-DEL

\[
SD: X [ \frac{a}{NP} X [\frac{\cdot}{\text{VERB}} \frac{\downarrow}{\text{-INDEPEND}}} \quad X [\frac{b}{NP} [\frac{\downarrow}{X}]] X \Rightarrow \quad S \quad VP \quad S \quad VP\\
1 \quad 2 \quad 3 \quad 4
\]

SC: 1, \emptyset, 3, {h}^4

Conditions: \(a=b\)

The next rule to be presented is Tì INSERT, which attaches the complementizer tì at the head of the complements of [-LOCUTION] verbs, i.e. verbs of willing (cf. section 5.4), perceiving (cf. section 5.5), and auxiliaries (cf. section 5.6). Since this rule follows both Tì INSERT and EQUINP-DEL, we need not specify the features of the matrix verb because at this point in the cycle of rules only sentential complements of [-LOCUTION] verbs which have not had their subjects deleted (i.e. all complements of verbs of perceiving, and complements of verbs of willing and auxiliaries whose subjects are not identical to the matrix verb) remain without complementizers.
(53) `ti INSERT

SD: \[ X \ Vb \ X \ [ [ \ X \ ] ] \ X \Rightarrow \]
\[
S \ NP \ S \ VP
\]
\[
1 \ 2
\]
SC: \( l, ti+2 \)

\[
\]

ME TRANSPORT (cf. section 5.4 (22) and section 5.6 (32)), which optionally shifts the particle me from a matrix Vb to the Vb of an infinitival complement, is presented in (54) below.

(54) ME TRANSPORT (optional)

SD: \[ X \ me \ ] \ [ \ X \ ] \ X \Rightarrow \]
\[
Vb \ VP \ Vb
\]
\[
1 \ 2 \ 3 \ 4
\]
SC: \( l, \emptyset, 3+2, 4 \)
Condition: \( a \subseteq b \)

\[
\]
The reason that there is no S node dominating the constituent VP in 3 of the SD of (54) is that non-branching S nodes are removed by a meta-theoretic convention (cf. Ross, 1967).

The next rule to be presented is CM INSERT (complement marker insertion), which inserts the particle la into the verbal group when me or any complement to the verb is present (cf. section 3.26 and section 3.30 (140) for a full explanation of the behavior of the complement marker la). Thus CM INSERT must follow ME TRANSPORT.

\[(55)\] CM INSERT:

\[
\begin{align*}
\text{SD: } & \quad X \ V \ (\text{ASP}) \ (\hat{e}) \ X \\
\hline
1 & \ 2 \\
\text{SC: } & \quad \text{1+la, 2} \\
\text{Conditions: } & \quad a \neq \emptyset
\end{align*}
\]

This rule follows both ME INSERT and ME TRANSPORT.

YE MOVE is the final rule to be presented in this section. It applies to the indefinite negative particle ye, which accompanies the negative auxiliary ka-pa, and attaches it as the right most member of the VP which dominates ka-pa. (For comments on the indefinite negative cf. section 3.34,
and on the negative as an auxiliary verb cf. section 5.6 and section 5.11 note 11.) In section 7.5 it will be shown that YE MOVE is a post-cyclic rule.

(56) YE MOVE

SD: \( X \ y e \) \( V \ y b \) \( V P \)

\[ \begin{array}{cccc}
1 & 2 & 3 & 4 \\
\end{array} \]

SC: 1, \( \emptyset \), 3+2, 4

Condition: \( a \geq b \)

The formulation of FUT DEL (deletion of the future auxiliary from complements of \([-\text{REAL}]\) verbs, cf. section 5.4 (25) and following remarks) is deferred until a later section (cf. section 9.2).
5.11 Footnotes

1. This is not my discovery, of course, but rather it has been noted by others in other languages, cf. Katz and Postal, 1964, pp. 74-79 and note 9 of chapter 4 for verbs of command and imperatives; cf. R. Lakoff, 1968, p. 78 and p. 200 for verbs of willing.

2. West African languages have often been supposed to have no passive construction. This is untrue for Mooré, and for many other supposedly 'passiveless' languages, I suspect. What can be said is that the passive in these languages is obligatorily agentless, e.g. Mooré has no equivalent to the by phrase of English passives. But any normal transitive verb may take its deep structure object as surface subject minus a surface object. Such sentences have the force of an English agentless passive, though there is no special marking on the verb, e.g. compare (a) and (b) below.

(a) a pűba ki wā.
   he/has beaten/millet/the
   'He has beaten the millet.'

(b) ki wā pűba me.
   millet/the/has been beaten/me
   'The millet has been beaten.'

I will not formulate the passive rule for Mooré in the present work.

3. The verb soke 'to ask' belongs formally to the class of verbs of declaration when it expresses an indirect yes/no question:

(a) m sok a la me ti naabā waa me.
   I/asked/him/la/me/that/chief the/has come/me
   'I asked him if the chief has come.'

It is also possible to express this by placing an indicative if clause (with optional disjunction) after soke:

(b) m sok a la me naabā sā n waa me (bi a sā n pa wa ye.)
   I/asked/him/la/me/chief the/if/n/has come/me/or/
   if/n/not/has come/ye.
   'I asked him if the chief has come or not.'
Something like (b) above (but with the matrix S in the form of an abstract hypersentence) may be the source for normal yes/no questions, which have the form of a normal declarative statement followed by the disjunctive particle bǐ or by a lowering of the final tone:

(c) naabã waa me bii?

chief+the/has come/me/bii

'Has the chief come?'

(d) naabã waa mè?

chief+the/has come/me

'Has the chief come?'

I shall not present an analysis of questions in this thesis other than to suggest that they, like declarative sentences, originate in deep structure as complements of an abstract declarative verb, though it has the added feature of being an interrogative verb.

4. Both ḡidge 'to prevent' and ḍigi 'to forbid' take obligatory negative in the complement:

(a) a ḡidg m la me t'm da kul ye.

he/prevented/me/la/me/that/I/not/leave/yè

'He prevented me from leaving.'

(b) a ḍig m la me t'm da kul ye.

he/forbade/me/la/me/that/I/not/leave/yè

'He forbade me to leave.'

Note that in French such verbs take a pleonastic negative when the complement is not reduced: Empêchez qu'il ne sorte!, 'Prevent him from going out!'.

5. Both toge and segde are subject to an additional transformation which optionally applies before EQUI-NP-DEL and deletes the matrix subject. This gives rise to (a) and (b) below; if the optional transformation does not apply, then (c) and (d) result from EQUI-NP-DEL:

(a) toga me ḳ fo kuli.

necessary/me/that/you/leave

'It is necessary that you leave.'
(b) segda me tì fo kuli.
    is right/me/that/you/leave
    'It is right that you leave.'

(c) fo toga me n kuli.
    you/ought/me/to/leave
    'You ought to leave.'

(d) fo segda me n kuli.
    you/are right/me/to/leave
    'You are right to leave.'

For further comments on extraposition in Mooré cf. note 7 below.

6. When mOdge is head of a three place predicate in which the object NP is reflexive, the Complement S undergoes EQUI-NP-DEL: m modga m menga n di, 'I forced myself (m menga) to eat'. Presumably the deletion of the subject NP of the complement S is on identity with the subject and not the object NP of the matrix, since otherwise we would expect (20a) to reduce to: m modg a la me n kuli, which is unacceptable. Thus EQUI-NP-DEL in Mooré is restricted to identity of subjects and never deletes the subject of a complement S on identity to the object of the matrix S, as occurs in English, e.g. note the translation of (20a). Note that this is a counter example to Rosenbaum's principle (cf. Rosenbaum, 1965).

7. Note that tOe may appear in the surface with an impersonal 'it' subject, which is zero in Mooré, and a complement of the type that follows verbs of perceiving, i.e. tì as a complementizer, indicative negative, and declarative marker me (cf. section 5.5); in such sentences tOe translates as 'It is possible...'.

(a) tOe me tì`a kula me.
    is possible/me/that/he/left/me
    'It is possible that he has left.'

I shall assume that the surface sentential complement a kula me 'He has left' of tOe in (a) above originates in deep structure as the subject of tOe and that it has undergone obligatory extra-position, i.e.

\[
\begin{array}{c}
\text{S NP} \\
\text{NP VP} \\
\text{VP S} \\
\text{S NP NP VP} \\
\text{VP S}
\end{array}
\]
Although tōe never appears in the surface with a sentential subject (i.e. there is no Mooré sentence which corresponds to the English sentence 'That he has left is possible'), I have found a few examples of sentential subjects which optionally undergo extraposition. In these cases the extra-posed clauses appear as complements with the following structure: tì complementizer, indicative negative ka~pa, and no independent declarative marker or perfective aspect. The only verb that I have found which does this is the idiom tū ne ... yam leoogo... ('to follow (tū) with (né) someone’s pleasure (yam leoogo)') 'to be all right with someone to do something' or 'to consent for someone to do something'. The sentential subject appears in the surface as a factive nominalization, i.e. a sē clause (cf. section 7.6). This is illustrated in (b) and (c) below:

(b) fo sē kulũ tűuda ne naab yam leogo.
     you/sē/leave+(w)ã/follows/with/chief's/spirit/pleasure
     'Your leaving is all right with the chief (naãbá).'

(c) tűu ne naab yam leogo tì fo kulũ/tì fo pa kul ye
     is all right/with/chief's/spirit/pleasure/that/
     you/(not)/leave/(ye)

     ['It's all right with the chief if you leave/if you
     don't leave.'
     'The chief has consented to your leaving/your not
     leaving.]

There are certain adjectives such as nàna 'easy' and toogõ 'difficult, hard' whose extra-posed sentential subjects have the same form as that in (c) above, e.g. (f) below, though when the deep sentential subject appears as subject in the surface it has the form of an action nominal, e.g. (d) below, and there is an additional stage in that the subject NP of the subject clause plus the prepositional particle ne is placed after the matrix predicate adjective, e.g. (e) below.

(d) tōnd kulbu yaa nana.
     our/leaving/is/easy
     'For us to leave is easy.'

(e) kulbu yaa nana ne tōnd.
     leaving/is/easy/with/us
     'To leave is easy for us.'

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yaa nana ne tõnd t`d kuli/t`d pa kul ye

is/easy/with/us/that/we/leave|that/we/not/leave/ye

'It's easy for us to leave/not to leave.'

I have recorded only a few verbs and adjectives that undergo extraposition and, in general, it doesn't seem to be as wide ranging a rule in Moré as it is in English. Since my investigations in this area are far from complete, I will not provide a formal rule for extraposition.

8. It is not completely accurate to say that complements of this type of verb occur only with future adverbs, since in sentences such as (a) below a past tense adverb occurs:

(a) The day before yesterday John said that he wanted me to leave yesterday.

But notice what happens when we change the indirect quote in (a) above to a direct quote, as in (b) below. The past tense adverb yesterday becomes the future adverb tomorrow:

(b) The day before yesterday John said: 'I want you to leave tomorrow.'

Thus we can say that in deep structure the complements of [-REAL] verbs are always in the future with respect to the verb of the matrix S, even though, in the surface, future adverbs may become past adverbs by a rule or principle which I am unable to formulate at this time.

9. I should point out here that there are three morphemes which are easily confused but which have different meanings: 1) the normal future 'verb' nā, which is always followed by the complementizing particle n; 2) nà, a future emphatic or optative particle, which in addition to having low tone (though like other low tone particles it raises to high when preceded by an elided high) is never followed by n and the main verb which follows it does not take me; 3) nàn, which originates from the VP adverb nànnanda 'just now', and which may be preposed to post subject position. Examples of the three are given below:

(a) tõnd na n kula mé.

'We are going to leave.'

(b) tõnd nà kúlì.

'We shall leave!'

(c) tõnd nàn kùlà mé.

'We just left.'

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(d) tōndâ kula nānnândá.
'We just left.'

I am indebted to Frère Jean Baptiste Bunkongo for pointing out these distinctions to me.

10. Some other verbs which may take action nominals as complements are: singe 'to begin', saage 'to hope', and kālge 'to be near to doing something; almost'. The verbs mè 'to know' and zāmsee 'to learn' also may occur with such complements, but they always carry the sense of 'manner' described below, i.e. 'to know how to do something', 'to learn how to do something'. Since action nominals are not important to the central focus of this thesis, I shall not say much about them. However, perhaps a brief sketch is in order.

The formation of action nominals involves the addition of a nominal suffix to the verb (cf. section 3.9) and if there is a NP complement present, it is permuted to a pre-verbal position (between the subject NP and the verb, if the former is present); the resulting surface structure is that of a possessive construction. This may result in ambiguity, e.g.

(a) aYamb togsha solmdā... ⇒ aYamb solmdā togsgo...
Yamba/told/story... Yamba's/story/telling...
'Yamba told the story.' 'Yamba's telling of the story...'

(b) ned togsha aYamb solmdā ⇒ aYamb solmdā togsgo...
man/told/Yamba's/story Yamba's/story/telling...
'Someone told Yamba's story.' 'The telling of Yamba's story...'

Also, sometimes action nominals have the sense of English 'manner' nominalizations, e.g. compare (c) and (d) below, where the former is a manner action nominal and the latter a 'factive' nominal (cf. section 7.6 for a discussion of sê clauses):

(c) aYamb solmdā togsg taa m yam.
Yamba's/story/telling/arrived at/my/mind
'Yamba's telling of the story pleased me.'
(i.e. 'The way that Yamba told the story...')
(d) aYamb sē togs solmdē taa m yam.

Yamba/sē/told/story/arrived at/my/mind

'Yamba's telling the story pleased me.'
(i.e. 'The fact that Yamba told the story...')

I shall consider that action nominals which have this sense of manner contain a pro-form manner adverbial woto 'in that manner, thus' which is deleted in the surface. (Such an analysis was first suggested in Katz and Postal (1964, p. 122 ff.).) Note that action nominals which appear as complements of verbs of willing do not have this sense of manner.

Since I have found no arguments in favor of a lexical derivation of action nominals (cf. Chomsky, 1968), I will assume that they are transformationally derived and that they have the deep structure in (e):

(e) NP
   \ | D
   S

the T rule in (f) applies to (e):

(f) T ACTION NOMINAL

SD: X [ [ NP [ [ +V NOM S VP Vb [ -STATIVE ASP ] (NP) X]
      1 2
      3 4 5 6

SC: 1+5, 2+af, φ, 4, φ, 6

(For comments on the feature [-STATE] cf. section 5.8.)
After pruning of the non-branching S and VP nodes, the surface structure in (g) results:

(g) NP
   \ | D
   S
   NP VP Vb
   \ | af

Given the deep structure in (27) for sentential complements of verbs of willing where the future auxiliary na is present, the question arises as to whether or not the future is present in action nominals that act as complements of
verbs of willing, since they have the same meaning. Though action nominals never show aspect or auxiliaries in the surface, they do contain adverbs, and the same restrictions on adverbs that hold for sentential complements of verbs of willing also hold for action nominals, e.g. compare (h) and (i) below with (26a) and (26b) respectively in the text.

(h) m data a beoog kulbu.
    I/want/his/tomorrow's/departure
    'I want him to leave tomorrow.'

(i)*m data a zaamë kulbu.
    '*I want him to leave yesterday.'

From this it would seem that a future auxiliary is present in the deep structure of action nominals which act as complements of verbs of willing. I shall not pursue this further in the present work.

11. Verbs in final position of a cleft sentence which are preceded by a negative behave as they do when preceded by nā n (cf. section 3.32 (1k8)) or any other auxiliary: they never carry the perfective suffix -yë, e.g. yaa yë n kulyë, 'It's him who left,' versus yaa yë n pa kulī, 'It's him who didn't leave.' *yaa yë n pa kulyā.

The observation that ka ~pa (and da) is a verb was first made by R. P. Alexandre (1953, Vol. I, p. 157). He notes that: 1) it may take the post verbal particles ē and la (i.e. the complement marker), e.g. à kāē [kayn] là ka, 'He wasn't here just a moment ago,' (where the second ka means 'here'); 2) it replaces the copular verb yā 'to be' in negative copular sentences, e.g. à yā neere, 'She is beautiful' versus a ka neer ye, 'She isn't beautiful'; 3) there is an abstract verbal noun derived with the suffix -m (cf. section 3.13) which is formed from it: kāalm 'a lack'.

12. Subordinate clauses which contain wēg with the meaning 'provided that...' are in the subjunctive:

(a) a tōe n tuma me, eb da weg n togmd a ye.
    he/can/n/work/me/they/not/provided that/n/bother/him/ye
    'He can work, provided that they don't bother him.'

(b) a na n waa me, fo weg n kō a ligdi.
    he/will/n/come/me/you/provided that/n/give/him/money
    'He will come, provided that you give him some money.'
I am not certain what the source of the subjunctive is in these clauses. However, it seems fairly certain that the subjunctive does not come from the auxiliary weg, since a main clause containing this auxiliary is not in the subjunctive.

(c) a weg n dij me.
   he/at least/n(has eaten/me
   'He's eaten at least.'

(d) a ka weg n dij me.
   he/not/at least/n/eat/me
   'He hasn't eaten at least.'

I shall not deal further with constructions containing weg in this thesis.

13. Sentences with the auxiliary mi are often translated as a simple habitual present. The verb which follows it is obligatorily in the imperfective.

(a) a mi n yūda daam.
   he/customarily/n/drinks/beer
   'He (customarily) drinks beer.'

(b)*a mi n yūu daam.

Other auxiliaries whose complement verbs must be in the imperfective are: nīb 'sometimes'; kete 'still'; gōode 'often'.

14. I have found the following exceptions to this latter generalization: the verb of willing make 'to try' and the auxiliary kete 'to cause (indirectly)', both of which may take the imperfective aspect. But both of these verbs are atypical of their respective classes in other ways, i.e. the former obligatorily undergoes EQUI-NP-DEL, while the majority of verbs of willing optionally do so, and the latter does not undergo EQUI-NP-DEL, while the majority of auxiliaries obligatorily do so (cf. section 5.4 and section 5.6). (The other auxiliary which does not undergo EQUI-NP-DEL, sake 'let it be that...', may also behave like kete with respect to the imperfective, though I haven't checked it out.)

15. In a complete grammar these qualifiers would be represented in deep structure by the features [\+DEFinite] and [\+SPECific]:

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(a) \( \text{wā} = \begin{bmatrix} +\text{DEF} \\ +\text{SPEC} \end{bmatrix} \) 'the'

(b) \( \text{ninga} \) (sg.) = \( \begin{bmatrix} -\text{DEF} \\ +\text{SPEC} \end{bmatrix} \) 'some'; 'a certain'

(c) \( \text{syemre} \sim \emptyset = \begin{bmatrix} -\text{DEF} \\ -\text{SPEC} \end{bmatrix} \) 'a'

For a detailed explanation of this analysis, cf. Stockwell, Schachter and Partee, 1968.

16. The past tense marker has two variants \( \text{dā} \) and \( \text{dāg} \); the latter is obligatorily followed by the complementizing particle \( \text{nā} \) while the former cannot be followed by \( \text{nā} \), e.g.

(a) a da yūuda daam.

'He was drinking beer.'

(b) a dag n yūuda daam.

'He was drinking beer.'

(c) a da n yūuda daam.

This is exactly the behavior noted for certain auxiliaries in section 5.6 (36). This can be taken as evidence that at one time the past tense marker was an auxiliary verb like those in (37) and (38) of section 5.6. (However, in the present stage of the language it differs from auxiliaries in that a following non-stative verb is marked for perfective aspect, e.g. compare (d) below with section 3.32 (145).)

(d) yaa doogē la yē da düşyā.

it is/the house in/that/she/had/cooked

'It's in the house that she had cooked.'

Also, when it has the form \( \text{dāg} \), the past tense marker may be indefinitely iterated with the sense of 'a long, long ... time ago.'

(e) a dag n dag n dag n waa me...

'He came a long long long time ago...'

Alternatively, we might analyze \( \text{da}(g) \) as an auxiliary in the present stage of the language and simply mark it as an exception to P DEL in section 5.10 (51). I have not chosen this alternative.
17. It is possible that on closer analysis we would want to consider that there is a zero present tense and that tense is an obligatory part of every sentence. For example, the imperfective by itself is ambiguous and may mean either present continuous action or generic/descriptive present, e.g.

(a) a yuuda daam.

'He is drinking beer.'

'He drinks beer.'
6.0 Performative Verbs

6.1 'Explicit' Performatives in Mooré

Explicit performatives (cf. section 4.2 (1) and (2)) are not as readily identifiable by formal criteria in Mooré as they are in English. For example, I have found no Mooré equivalent of the English performative adverb 'hereby' as in 'I hereby order you to leave' (though there may be one); nor does Mooré have a formally distinct non-progressive present tense, since the imperfective marks both the progressive and non-progressive present in the surface, as remarked in note 17, section 5.11. Thus explicit performatives are formally identical to present progressives, e.g. compare the performatives in (57a,b,c) with the non-performative in (57d).

(57) a) m kaabd f la me t'm na n waa me.
   I/promise/you/la/me/that/I/will/n/come/me
   'I promise you that I will come.'

b) m sagn d f la me t'f kuli.
   I/advise/you/la/me/that/you/leave (for home)
   'I advise you to leave (i.e. 'go home').'

c) m wenda me t'a maana me.
   I/swear/me/that/he/did/me
   'I swear that he did (it).'

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d) m wābdā me.

I/eating/me

'I am eating.'

With respect to the verb classes defined in section 5, we can make the following generalization: all performative verbs belong either to the class of 'true' verbs of declaration (cf. section 5.2 (9)) or to the class of verbs of command (cf. section 5.3 (14)). This means that in terms of features, performatives are [+LOCUTION] and [-STATIVE] (where the class of [-STATIVE] sentential complement verbs is equal to the class of three place predicate verbs, cf. section 5.8 (42)). Rather than create a special feature [+PERFORMATIVE] as Ross (1968) does, I shall consider performatives to be a special occurrence of verbs of the above mentioned feature type and I shall be content for now with the general definition given in (58).

(58) An 'explicit' performative verb in Mooré is any [+LOCUTION,-STATIVE] verb which occurs in the imperfective aspect (present tense?) with a 1st person ('speaker') subject and a 2nd person ('hearer') NP object plus sentential complement, where the NP object may be 'understood'.

Note that the above definition is not sufficient to describe the limited distribution of performative sentences, i.e. for the most part they may occur only as main sentences and not in nominalizations or restrictive relative clauses,
e.g. 'My hereby ordering you to leave...' 'I who hereby order you to leave...'. In section 7 I shall present certain facts having to do with conjunction and disjunction which permit a slight restructuring of the phrase structure that will enable us to define in a precise way the context of occurrence for performatives.

6.2 The Abstract Performative Verb of Declaration and Direct Quotations

As noted in section 3.28, all non-emphatic, affirmative declarative sentences contain the post-verbal particle me. The rule presented in section 5.10 (48), ME INSERT, accounts for the presence of me in verb complements. If we accept the notion of an 'abstract' performative verb of declaration as the matrix for declarative utterances, then the same rule which inserts me in complements of non-abstract verbs of declaration will also insert me into regular, surface main clause declaratives. Thus I shall posit that there is a feature [+ABSTRACT] for verbs, and that there is a true verb of declaration which is marked [+ABSTRACT]; all the true verbs of declaration in section 5.2 (10) are [-ABSTRACT]. As we shall see in later sections, several other verb classes have a [+ABSTRACT] member, also.

In general we can say about 'abstract' verbs that they possess the semantic/syntactic, strict subcategorization, and selectional features which are typical of other members of the particular class to which they belong, but that they
do not possess the idiosyncratic features which distinguish the individual [-ABSTRACT] verbs within a given class. Most importantly, this means that they do not possess a phonological representation and that they therefore never appear in the surface. [+ABSTRACT] true verbs of declaration and command are always performative and thus they always occur in the imperfective aspect and their subject and object nouns are the 'speaker' and 'hearer' respectively.

I shall hypothesize, then, that the deep structure for the declarative sentence aYamba wâbda me 'Yamba is eating' is that in (59) where NP$_S$ is 'speaker' and NP$_h$ is 'hearer' as defined in section 4.2, though I haven't specified them here. (Note that if NP$_S$ were identical to the subject of S$_1$, i.e. 'Yamba', then the subject of S$_1$ would be pronominalized to m(am) 'I' and if NP$_h$ were identical to it, then it would be pronominalized to t(o)/Y(åmba) 'you'.)

(59)  
```
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There is then need of a rule such as that in (60) which reduces sentences with abstract performative verbs. (Actually (60) will probably turn out as a part of the metatheory in the end, i.e. a metatheoretic reduction convention.)

(60) HYPER-Sentence REDuction

\[
\begin{align*}
\text{SD:} & \quad X (\text{NP}) \left[ \begin{array}{c}
+\text{VERB} \\
\text{VP} \quad \text{Vb} \quad +\text{ABSTRACT}
\end{array} \right] X (S) \right] X \\
1 & \quad 2 & \quad 3
\end{align*}
\]

\[
\text{SC:} & \quad 1, \emptyset, 3
\]

I shall assume that HYPER-S-RED operates cyclically and follows most of the rules given in section 5.10. It deletes from the hyper-sentence the subject NP and everything in the VP except the complement S. The parentheses around the subject NP in the SD of HYPER-S-RED permits its application to other sentences with abstract verbs whose subjects have been removed, e.g. the abstract verb underlying reason adverbials (cf. section 9.1 (201) and following remarks); also, the conjunctive particle la (cf. LA INSERT in section 7.2 (88)) may be present but is not deleted.
But then the question arises as to why $\dot{t}i'$ is not present at the head of normal declarative sentences. As it stands now TÍ INSERT will apply to (59) and the surface sentence (after deletion of the hyper-sentence) will have the form: $\#t'aYamb \ wa\bda\ me$. There exists a type of sentence in which complements of non-abstract true verbs of declaration appear without the complementizing particle $\dot{t}i$: namely, when the complement $S$ is a direct quote as shown in (61). (The same is true of 'that' in English as the translation shows.)

(61) aYamb yeela aTene: 'm nonga daam'.

Yamba/said/Tene/'I/like/beer' 'Yamba said to Tene: 'I like beer!''

Note that the subject of the direct quote is 1st person when it is identical to that of the matrix $S$; this shifts to 3rd person and the complementizer $\dot{t}i'$ appears when the direct quote is changed to an indirect quote, as (62) shows: (the subscript indicates identity of reference).

(62) aYamb$_i$ yeela aTene $t'a_i$ nonga daam.

'Yamba$_i$ told Tene that he$_i$ likes beer.'

Prior to the introduction of performative theory, generative grammar had no way of handling direct quotes. Sadock (1969) has shown that the notion of abstract performative hypersentences can provide a very natural explanation for direct quotes. He postulates that they differ from indirect quotes in that the former is a sentential complement which contains a hypersentence whose subject is identical to
the subject of the surface matrix verb of declaration while the latter contains no such hypersentence. Given this hypothesis, the deep structure for (61) is that in (63), while the deep structure for (62) would be like (63) except that it would be minus the hypersentence $S_{H3}$.

Therefore, in order to provide for lack of $ti$ in direct quotes we must restrict $T\bar{I}$ INSERT (49) to prevent its operation just when the matrix verb is an abstract true verb of declaration, i.e. $[+\text{LOCUTION}, +\text{REAL}, -\text{STATIC}, +\text{ABSTRACT}]$. 

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but not when it is an abstract verb of command, i.e. 
[+LOCUTION, -REAL, -STATIVE, +ABSTRACT] (cf. section 6.3)
and not when it is an abstract mental verb of declaration,
i.e. [+LOCUTION, +REAL, +STATIVE, +ABSTRACT] (cf. the abstract verb underlying reason adverbials in section 9.1). A revised version of TÍ INSERT is given below:

(64) TÍ INSERT (revised)

SD: 

\[
\begin{array}{c}
\text{[+VERB} \\
\text{+LOCUTION} \\
\text{<REAL} \\
\text{<STATIVE} \\
\text{<ABSTRACT}
\end{array}
\]

\[X \quad X \quad [ \quad [X] \quad ] \quad X \Rightarrow \]

\[S \quad NP \quad S \quad VP\]

SC: 1, tí + 2

Conditions: if \(\alpha\) and \(\gamma = +, \beta \neq -\)

This revised version of TÍ INSERT will not only account for the lack of tí in direct quotes but also in normal declaratives such as that represented by the base structure in (59) and the surface matrix sentences of (61) and (62). Note that tí will be inserted into \(S_{H3}\) of (63) but will be deleted along with the rest of the hypersentence by (60); if \(S_{H4}\) were embedded directly into \(S_2\), as is the case for the indirect quote in (62), then tí would be inserted into \(S_{H4}\) and would appear in the surface utterance.

Finally, Mooré seems to argue in favor of another claim made by Sadock (1969), that all surface utterances including 'explicit' performatives are complements of hypersentences. Given the analysis of the post-verbal particle me presented
in the preceding sections, this follows from the fact that 'explicit' performative verbs, like all other main clause declarative verbs, are followed by me, e.g. cf. (57a,b,c) above. Ross (1968) is not clear on this point.

6.3 The Abstract Performative Verb of Command and Imperative Constructions

The concept of an abstract performative verb will also explain the fact that, in Mooré, surface main clause imperatives in their full form are identical to complements of verbs of command (i.e. they exhibit all the characteristics noted in the first paragraph of section 5.3). This is illustrated in (65) and (66) where (65a) shows a verb of command with an affirmative complement and (65b) shows the same verb with a negative complement (kota is the irregular imperfective of kòse 'to ask someone to do something' listed in section 5.3 (15)) and (66a) and (66b) illustrate a surface affirmative and negative imperative respectively.

(65) a) m kot f la me tí fo kuli
   I/request/you/la/me/that/you/leave
   'I request you to leave', 'I request that you leave.'

   b) m kot f la me tí fo da kul ye.
   'I request that you not leave.'

(66) a) tí fo kuli!
   that/you (sg.)/leave
   'Leave!'
b) tí fo da kul ye.
   that/you/not/leave/ye
   'Don't leave!'

(66a) and (66b) may optionally be reduced to (67a) and (67b):

(67) a) kuli!
    'Leave!'

b) da kul ye!
    'Don't leave!'

In the case of an imperative with a 2nd plural subject, in the reduced form the subject is not deleted and appears in post verbal position, as shown in (68).

(68) a) tí'y kuli.
    that/you (pl.)/leave
    'Leave!'

b) kul-ymology
    leave/you (pl.)
    'Leave!'

I shall propose the structure in (69) as the deep structure for imperatives, where \( S_2 \) is the surface imperative.

```
(69) SH1
    NP_s  VP
      Vb    NP_h
        ASP NP
          +LOCUTION -REAL -STATIVE +ABSTRACT

   S2  VP
```

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The same rules which apply to complements of verbs of command, i.e. TÍ INSERT (section 6.2 (64)), SUBJUNCT NEG and P DEL (cf. section 5.10 (50) and (51)) and FUT DEL (cf. section 9.2 (222)), will apply to \( S_2 \) of (69). The rule in (60) will reduce the hypersentence \( S_{H1} \). In addition, it is assumed that there are two late optional transformations which operate on imperatives like (66a) and (68a) to reduce them to forms like (67a) and (68b) respectively.\(^3\)

The same principles of pronominalization between a hypersentence and its complement mentioned in section 4.2 (cf. the remarks preceding (3)) also apply to structures like (66), i.e. where \( NP_h \) of \( S_{H1} \) is identical to the subject \( NP \) of \( S_2 \), the latter is pronominalized as 2nd person. The notion of imperatives originating as complements of an abstract verb of command also accounts for the fact that imperatives never have 1st person subjects. This follows from the observation that in general verbs of command do not take complements with identical subjects nor do they take reflexive objects. Thus by accepting the above mentioned notion of imperatives, this restriction on verbs of command accounts for the unacceptability of both (70a) and (70b) and (70c) and we need not formulate a special restriction to account for (70c).\(^4\)

\[(70) \ a) \text{ "m kot f la me t’im kuli.} \]

'"I request of you that I leave.'
b) *m kota m menga me 't'm kuli.
   "I request myself to leave."

c) *t'm kuli.
6.4 Footnotes

1. That is not to say that all true verbs of declaration and verbs of command may be used as performative, though it seems as though nearly all of them can. For example, the verbs 'to persuade' and 'to convince' seem odd in the following English sentences:

a) *I hereby persuade you to leave.
b) *I hereby convince you that Harry has left.

as does the verb tōogete 'to persuade/convince' in the Moore sentences in (c) and (d):

c) *m tōogd f la me tí fo kuli.
    *I persuade you to leave.'
d) *m tōogd f la me t'aTene waa me.
    *I convince you that Tene has left.'

2. The 2nd person plural pronoun in reduced imperatives is attached under Vb and if a complement follows it the complement marker la is inserted after it by the rule in section 5.10 (54). Thus complements of 2nd person plural reduced imperatives behave like those which follow short form pronoun objects where la is elided (cf. section 3.26 and section 3.30), e.g. note the raising of the initial low tone of dōogete 'in the house' and the resulting non-automatic downstep on its second tone in the following sentence: wāb-y dōogete 'Eat in the house!'"}

3. There is also a form of the imperative where bī replaces tí, e.g. bi fo kuli, 'Leave!' The particle which marks disjunction is also bī ('or'). I haven't found any connection between disjunction and imperatives and there appears to be no difference in meaning or grammatical behavior between imperatives with tí and bī, so I shall assume that a late rule optionally replaces tí with bī.

4. However, it should be pointed out that the pronominal analysis with respect to abstract verbs of command is not without difficulties. In Moore there are also 3rd person imperatives such as those in (a) and (b) below:

a) t'aYamb kuli!
   that/Yamba/leave
   'Let Yamba leave!'  'Yamba should leave!'
b) t'ā kulī
that/he/leave
'Let him leave!'  'He should leave!'

Given the analysis proposed in (70) one would assume that the hypersentences in which (a) and (b) are embedded in deep structure have an object 'hearer' NP which is not identical to the subject of its complement, because if it did, we would expect (a) and (b) to have 2nd person subjects. But in general it seems that most verbs of command only permit complements which have subjects that are identical to their object NPs. Unfortunately I have not checked this out in Moore, but I would guess that the Moore' sentence in (c) is as unacceptable as the English sentence in (d).

c) m kot  f la me t'āYamb kulī.
d)'I request (it) of you that Yamba leave.

Though on the other hand we do get sentences like (e) in English

e) I tell you (that) Yamba should leave.

I don't know if the Moore' sentence in (f) is acceptable with the meaning of (e).

f) m yeend  f la me t'āYamb kulī.

Sadock (1969) presents several interesting arguments to show that in certain cases deep structures must contain hypersentences embedded in hypersentences, i.e. two or more levels of hypersentences. Although Sadock does not discuss this particular case, an analysis such as he proposes could provide a way around the above difficulty in that it might be supposed that the uppermost sentence of all deep structures is a hypersentence with a verb of declaration and that, surface 1st and 2nd person pronouns always take as their antecedents the speaker and hearer nouns of the nearest dominating hypersentence with a verb of declaration as its main verb. Thus ȘH₁ in (69) would itself be the complement of a higher hypersentence whose subject NP would be identical to that of ȘH₁ but whose object NP would not necessarily be identical to the object NP of ȘH₁.

Since I have not been able to investigate this thoroughly I shall not pursue it further in the present work.
7.0 Conjunction and Disjunction

In this section evidence from Moore is presented which motivates an analysis of conjunction and disjunction as basically different types of structures. (Traditionally both have always been considered to be the same type of structure, i.e. conjoint Ss under a common S node with the distinction between the two lying in the connector which separates the conjoint Ss—and or or.) First the structural facts about conjunction are presented (section 7.1) and it is shown that there are two structurally distinct types, 'dependent' and 'independent', where non-initial clauses in strings of the former type behave like subordinate clauses while all members of independently conjoined strings have the characteristics of independent main clauses. Next a deep structure for conjunction which accounts for these two types is proposed (section 7.2). Then the structural facts of disjunction are given (section 7.3) and a deep structure distinct from that for conjunction is offered (section 7.4). Following this, there is a discussion of conjunction of noun phrases, both phrasal and derived, (section 7.5) and it is shown that the latter always results from the reduction of an 'independently' conjoined string. Then conjunction in
relative clauses is examined (section 7.6) and further evidence for the distinction of two types of conjunction as well as a structural difference between conjunction and disjunction is found. Finally, there are some general remarks concerning depth branching in conjunction and disjunction, and also some reflexes in English of the Moóré distinctions between dependent and independent conjunction and between conjunction and disjunction are mentioned (section 7.7).

7.1 'Dependent' and 'Independent' Conjunction

In Moóré there are two formally distinct types of conjunction, 'dependent' and 'independent'. The former links sentences whose actions or ideas are closely linked in a sequential or simultaneous dependence, e.g. 'He cooked the meat and (then) ate it.' but "He ate the meat and (then) cooked it." In the latter type, the sentences are stated as independent facts, though they may in reality be sequentially or simultaneously connected, e.g. 'He cooked the meat, and he (also) ate it.' or 'He ate the meat, and he (also) cooked the meat.' This distinction has been previously noted for English by J. F. Staal (1968) in his reiteration of G. Ryle's (1954) observation that (71a) and (71b) do not have the same meaning:

(71) a) She took arsenic and fell ill.
    b) She fell ill and took arsenic.

The sentences of (71) are examples of what I call dependent conjunction; Staal characterizes what I call independent
conjunction as being equivalent to the symmetric 'and' of logic where 'P and Q' has the same meaning as 'Q and P'. (Later on--cf. the remarks following (152) in section 7.7--we shall see that in natural language only disjunction is truly symmetric.)

Dependent conjunction in Mooré has the following characteristics. Dependent conjoined sentences whose subjects are identical are connected by la (cf. 72a,b), while dependently conjoined sentences with non-identical subjects are connected by ti (cf. 73a,b). (In previous examples the verb kuli has been assigned the general gloss of 'to leave'; in the examples below it is glossed more accurately as 'to go home'; the verb gaande is glossed as 'to go to bed' and the final -de is part of the verb stem and not the imperfective -da, which would be gaandeda 'going to bed'.)

(72) a) aKulg la a gaande.
   Kulga went home/me/and/he went to bed
   'Kulga went home and went to bed.'

b) akulg la aTene gaande.

(73) a) aKulg t'aTene gaande.
   Kulga went home/me/and/Tene went to bed
   'Kulga went home and (then) Tene went to bed.'

b) akulg la t'a gaande.

Only the first sentence of a dependently conjoined series (where no reduction to VP conjunction has occurred) may contain the post verbal particle me, as the unacceptability of (74a,b) show. Also, only the first verb in a
dependently conjoined series may be marked for perfective aspect, as the unacceptability of \((74c,d)\) show; all subsequent verbs are either in the imperfective or aspectless form. An aspectless verb in such a series is always interpreted as having the same aspect/tense as the closest verb with marked aspect which precedes it in a dependent series, e.g. in \((72a)\) and \((73a)\) the second verb \textit{gaande} is unmarked for aspect but translates as perfective/past. (The first verb is marked for perfective in accord with the tonal principles established in section 3.32.)

\(74\)  
\begin{enumerate}
\item a) \*aKulg\textsubscript{i} kul la a\textsubscript{i} gaanda me.
\item b) \*aKulg kul t'\textsubscript{a}Tene gaanda me.
\item c) \*aKulg\textsubscript{i} kula me la a\textsubscript{i} gaandy\textsubscript{a}.
\item d) \*aKulg kula me t'\textsubscript{a}Tene gaandy\textsubscript{a}.
\end{enumerate}

Dependently conjoined sentences with identical subjects may be reduced to VP conjunction, in which case the connective particle is \textless n, e.g. \((72a)\) may be reduced to \((75a)\). In addition, the imperfective aspect may be optionally deleted from a non-initial verb in VP conjunction when it is preceded by a verb in the imperfective, as \((75b,c)\) shows.

\(75\)  
\begin{enumerate}
\item a) aKulg kula me n gaande.
Kulga/went home/\textit{me}/and/go to bed.
'Kulga went home and went to bed.'
\item b) pag\textsubscript{a} s\textsubscript{o}s\textsubscript{a} me n werda.
woman+the/is conversing/\textit{me}/and/grinding (meal)
'The woman is conversing\textit{while}\textsubscript{and} grinding meal.'
\end{enumerate}

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c) pagå sōsda me n were.

woman+the/is conversing/me/and/grind (meal)

'The woman is conversing \{and\} grinding \{while\} meal.'

Note that dependent conjunction bears a close resemblance in the surface to sentential complements of verbs of willing (section 5.4) and auxiliaries (section 5.6). (In fact, in many instances the two types of constructions are identical.) This can be seen in the fact that in both cases tì is used to mark non-identity of subjects between sentences and n is used to mark identical subjects, where the second identical NP subject has been deleted (obligatorily in the case of verb complements and optionally in the case of dependent conjunction); furthermore, in both constructions the second sentence is never marked for perfective aspect. An additional point of similarity is that ME TRANSPORT (cf. section 5.10 (54)) applies to conjoined VPs as well as VP complements. The sentences in (76), which are paraphrases, illustrate this.

(76) a) a waa me n dj n kuli.

he/came/me/and/eat/anû/go home

'He came and ate and went home.'

b) a wa n dji me n kuli.

he/came/and/eat/me/and/go home

'He came and ate and went home.'

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c) a wa n dį n kula me.

he/came/and/eat/and/go home/me

'He came and ate and went home.'

As in the case of VP complements, ME TRANSPORT in conjunction does not move me over an intervening NP complement, e.g. compare (77) below with (24) in section 5.4.

(77) a) a wāba nemd n kuli.

he/ate/meat/and/go home

'He ate some meat and went home.'

b) *a wab nemd n kula me.

c) a kula me n wāb nemdo.

he/went home/me/and/eat/meat

'He went home and ate some meat.'

d) a kul n wāba nemdo.

he/went home/and/eat/meat

'He went home and ate some meat.'

(In (77a) and (77d) me has been elided according to the principles established in section 3.29; its presence is signaled by the presence of the complement marker -a on the end of the verb—cf. section 3.30.)

In contrast to dependent conjunction, independent conjunction has the following characteristics. First, as shown in (78), the connective particle for all strings of independently conjoined sentences, regardless of whether or not their subjects are identical, is ḡa, which is formally identical to the connective particle for dependently conjoined sentences with identical subjects.
(78) a) aKulg₁ kula me la a₁ gaanda me.
    Kulga/went home/me/and/he/went to bed/me
    'Kulga₁ went home, and he₁ went to bed.'

b) aKulg kula me la aTene gaanda me.
    Kulga/went home/me/and/Tene/went to bed/me
    'Kulga went home, {and} Tene went to bed.
    {but}

Secondly, each sentence of an independently conjoined string
must contain the post verbal particle me. Third, the verb
of each sentence must be marked for aspect, i.e. either per-
fective or imperfective. These points are illustrated by
(78) above, though the presence of the perfective is not
evident because tone is not marked (cf. section 3.32 for an
explanation of the elision of the perfective marker and its
effect on the tone of the complement marker). There is no
special particle which corresponds to English 'but'; the la
of independent conjunction includes the entire range of
English 'but' as well as symmetric 'and', which in many
cases is interchangeable with 'but'.

A fourth difference is that, unlike dependent conjunc-
tion, independent conjunction cannot be reduced to VP con-
juction, as the unacceptability of (79) as a reduction of
(78a) shows:

(79) *aKulg kula me n gaanda me.

A final area of divergence between the two types of con-
junction is the behavior of the negative. When the negative
occurs in a dependently conjoined series, its scope may

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include the entire series which follows it, i.e. it may ne-
gate the series as a whole; and when the indefinite negative
particle *ye*, which is mutually exclusive with *me*, is present,
it comes at the end of the entire series, e.g. as in (80b).
(For remarks on the 'indefinite' negative and *ye*, cf. section
3.34; as mentioned previously, the negative *pa~ka...*(ye) is
a sentential complement verb belonging to the auxiliary class,
cf. section 5.6 and note 11 in section 5.11.)

(80) a) \(a_i\) pa kula \(m_1a_i\) gaande.

he/not/go home/me/and/(he)/go to bed

'He didn't go home and go to bed.'

b) \(a_i\) pa kul \(m_1a_i\) gaand ye.

he/not/go home/and/(he)/go to bed/ye

'He hasn't gone home and gone to bed (yet).'

I shall consider that negation of dependent conjunction such
as that in (80a,b) is a case of conjunction within the sen-
tential complement of the negative auxiliary verb. Note
that when a verb with a sentential complement is negated, if
*ye* is present, *ye* follows the verb plus its complement, as
the sentences in (81a,b) show.

(81) a) ka dat n kul ye.

he/not/want/to/leave/ye

'He doesn't want to leave.'
b) a ka yeel t'aTene kula me \{ \text{la a} \} gaand ye.

he/not/say/that/Tene/went home/me/and/(he)/
go to bed/ye

'He didn't say that Tene went home and went
to bed.'

On the other hand, in independent conjunction the scope
of a negative never extends over more than a single sentence
as indicated by (82), (83), (84):

(82) a) a pa kula me la a gaanda me.

he/not/go home/me/and/he/went to bed/me

'He didn't go home, but he went to bed.'

b) a pa kul ye la a gaanda me.

he/not/go home/ye/and/he/went to bed/me

'He hasn't gone home (yet), but he's gone
to bed.'

(83) a) a kula me la a a pa gaanda me.

he/went home/me/and/he/not/go to bed/me

'He went home, but he didn't go to bed.'

b) a kula me la a a pa gaand ye.

he/went home/me/and/he/not/go to bed/ye

'He's gone home, but he hasn't gone to bed (yet).'

(84) a) a pa kula me la a a pa gaanda me.

he/not/go home/me/and/he/not/go to bed/me

'He didn't go home, and he didn't go to
bed (either).'

b) a pa kul (ye) la a a pa gaand ye.

he/not/go home/(ye)/and/he/not/go to bed/ye

'He hasn't gone home, and he hasn't gone to
bed (either).'
Because of the fact that the scope of negation in dependent conjunction may extend over the whole series, there is a semantic ambiguity to (80a,b). One may negate (in both English and Mooré) the statement 'Kulga went home and went to bed,' for three possible reasons: a) it is false that Kulga went home, but true that he went to bed; b) it is true that Kulga went home, but false that he went to bed; c) it is false that Kulga went home and it is false that he went to bed. This is equivalent to the logical equation 
\[ \neg(p \cdot q) \equiv (\neg p \cdot q) \lor (p \cdot \neg q) \lor (\neg p \cdot \neg q), \]
where the left hand side of the equation is similar to the underlying form for (80a,b), i.e. a matrix negative verb, \( p_a = \neg \), with a conjoined sentential complement, \( p \cdot q \). The three disjoint statements on the right side are equivalent to the unambiguous independently conjoined sentences of (82)—\( \neg p \cdot q \), (83)—\( p \cdot \neg q \), and (84)—\( \neg p \cdot \neg q \). For someone to utter (80a,b) he would have to have the knowledge embodied in either (82), (83), or (84) as a presupposition. Thus (80a) and (80b) are not reductions of (84a) and (84b) respectively, as a superficial analysis might suppose (i.e. by deleting the second negative of (84)), because (84) is only one possible meaning underlying (80).²

7.2 The Deep Structure of Conjunction: Conjunction as a Right Branching Recursive Structure.

First, let us summarize the points raised in the previous section which our analysis of conjunction must account

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for: a) the difference in deep structure between dependent and independent conjunction; b) the fact that only the first (i.e. leftmost) sentence of a dependently conjoined series contains the post-verbal particle *me*, while all sentences in an independently conjoined string must contain *me*; c) that only dependent conjunction may be reduced to VP conjunction and that the conjunctive particle used, i.e. *n̂*, is the same particle which marks sentential complements which have undergone EQUI-NP-DEL; d) that only the verb of the first sentence in a dependently conjoined sentence must be marked for aspect (all subsequent verbs being either aspectless or imperfective), while in independent conjunction all verbs are obligatorily marked for aspect; e) that the same particle which marks sentential complements of [-LOCUTION,-INDEPEND] verbs whose subjects are not identical to the matrix subject, i.e. *tî*, also marks dependently conjoined sentences with non-identical subjects; f) that dependent conjunction which has been reduced to VP conjunction is subject to ME TRANSPORT under the same conditions as sentential complements which have been reduced to VP; g) the fact that the conjunctive particle which conjoins only sentences with identical subjects in dependent conjunction, i.e. *lása*, is the only conjunctive particle for independent conjunction; h) and finally the fact that the scope of the negative at the head of a dependently conjoined string may extend over the entire series which follows it, while in independent conjunction the scope
of negation may extend only over the sentence which immediately follows it.

Perhaps the most striking general observation is the close resemblance in the surface between non-initial clauses of a dependently conjoined series and certain types of sentential verb complements (cf. the remarks preceding (76) of the preceding section), i.e. both seem to be subject to many of the same T rules. Thus non-initial clauses of a dependently conjoined series behave like subordinate clauses with respect to the initial sentence of the series in the same way as do certain sentential verb complements with respect to their matrix sentences. I shall attempt to capture this in the following analysis of conjunction.

In dealing with the above points, we shall begin with dependent conjunction. First, with respect to point (a), I shall propose that in deep structure dependent conjunction is a right branching recursive sentence structure which is a right sister to VP under S. This is expressed in the PS rule in (85) (which is a revision of PS1 in section 5.9 (44)) where the optional S to the right of VP is the source of conjunction.

\[(85) \text{ PS } 1' \quad S \rightarrow \text{NP VP (S)}\]

(85) will generate structures like that in (86):

\[(86)\]

```
    S_1
   /   \
  NP   VP
   \   /
    S_2
   /   \
  NP   VP
    \  /
     S_n
```

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Given a structure such as that above, we can account for the fact that only the first sentence of a dependent series contains me (point (b) above and cf. (72), (73), (74) above) with no changes in the grammar, since ME INSERT (48) will add me only to a sentence which is immediately dominated by a VP that is headed by a [+INDEPEND] verb. If (86) is embedded as a sentential complement to a [+INDEPEND] verb, only $S_1$ will receive me and $S_2...S_n$ will receive no me. The sentences in (72) and (73) are complements of an abstract verb of declaration in deep structure and thus me is inserted in the initial S (cf. section 6.2); (81b) and (99d) show dependent series which act as the complement of a non-abstract verb of declaration (i.e. yeele 'to say') where the same phenomenon occurs. (Note that convention (d) in section 5.10 restricts the depth of operation of ME INSERT to the S which is immediately dominated by VP.)

Point (c) above, i.e. the fact that VP conjunction is identical in the surface to infinitival complements (cf. (75) above), can be accounted for by slightly altering EQUI-NP-DEL (52) to include dependently conjoined sentences. Such an alteration is presented below in (87) and the tree below indicates its application in dependent conjunction.

\[
\text{(87) EQUI-NP-DEL (revised)}
\]

\[
\text{SD: } X \xrightarrow{a} \left[ \begin{array}{c} \overline{\text{NP}} \; X \\ \text{S} \end{array} \right] \left[ \begin{array}{c} \overline{\text{VERB}} \\ \text{+INDEPEND} \end{array} \right] X \xrightarrow{b} \left[ \begin{array}{c} \text{NP} \; \left[ \begin{array}{c} X \\ \text{S} \end{array} \right] \right] \left[ \begin{array}{c} \text{VP} \\ \text{S} \end{array} \right] \xrightarrow{c} \left[ \begin{array}{c} \text{VP} \right] \left[ \begin{array}{c} \text{S} \end{array} \right] \right]
\]

\[
\begin{array}{cccc}
1 & 2 & 3 & 4
\end{array}
\]

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SC: 1, Ø, 3, n+4

Conditions: 1) a = b
2) if c = VP, ω = –

A similar revision of P DEL (51), TÌ INSERT (53), and ME TRANSPORT (54) will account for the points mentioned in (d), (e), and (f) respectively, i.e. the fact that only the first of a dependently conjoined series may be marked for perfective, that tì marks dependently conjoined Ss with non-identical subjects, and that VP conjunction may undergo ME TRANSPORT. In order to avoid repetition, I shall not give the revision of these rules here; the final versions can be found in the list of rules in section 10.

Point (g), the fact that la connects sentences in dependent conjunction which have identical subjects, is taken care of by adding the rule in (88).

(88) LA INSERT (optional)

SD: X [ NP X ] [ NP X ⇒
    S VP S

SC: 1, la+2

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Condition: \( a = b \)

\[
\begin{array}{c}
X \\
S \\
\text{NP} \quad \text{VP} \\
\text{S} \\
\text{la} \\
\text{NP} \quad \text{VP}
\end{array}
\]

la is attached under S and not NP, as is the case with ti and ti'—cf. section 5.10 (49) and (53); this different constituent structure is reflected in the behavior of la as opposed to ti and ti' with respect to vowel elision, cf. section 3.33. LA INSERT operates before EQUI-NP-DEL and is an optional rule. If it does not apply, then EQUI-NP-DEL (as revised above in (87)), which is an obligatory rule, will delete the identical subject of the embedded S and insert \( n \); if LA INSERT operates, then the presence of la will block EQUI-NP-DEL because the SD will not be met.

Point (h), the scope of negation in dependent conjunction is explained by the fact that the negative is a higher verb and that dependent conjunction may occur within its complement.

There is also need for an optional rule to delete the imperfective aspect from non-initial sentences in dependent conjunction which are preceded by an imperfective as noted in (75b,c) above. This rule will not be presented in the text but can be found in section 10 (as I-DEL).

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Now, with regard to independent conjunction, all of the above points can be accounted for with no changes in the proposed grammar. This is accomplished by analyzing independent conjunction as originating in deep structure as conjunction between abstract performative verbs such as is exemplified in (89) where \( S_1, S_2, \ldots S_n \) are sentential complements of the hypersentences \( S_{H1}, S_{H2}, \ldots S_{Hn} \) respectively, e.g., cf. section 6.2 (59).

\[
\text{(89)} \quad S_{H1} \quad \begin{array}{c}
NPS \\

NP_S
\end{array} \quad \begin{array}{c}
VP \\

VP
\end{array} \quad S_{H2} \quad \begin{array}{c}
NPS \\

NP_S
\end{array} \quad \begin{array}{c}
VP \\

VP
\end{array} \quad \cdots \quad \begin{array}{c}
NPS \\

NP_S
\end{array} \quad \begin{array}{c}
VP \\

VP
\end{array} \quad S_{Hn} \quad \begin{array}{c}

\end{array} \quad \begin{array}{c}
S_n
\end{array}
\]

Given (89) as a deep structure for independent conjunction, we can give the following account of its surface structure. First, every \( S \) of an independently conjoined string contains \textit{me} (point (b) above) because in as much as each such \( S \) is the sentential complement of a separate abstract verb of declaration, \textit{ME INSERT} (48) will operate on each one individually.\(^3\)

The fact that every sentence in an independently conjoined series is obligatorily marked for aspect (point (d)
above) is explained by the fact that, since each $S$ is an individual complement, the SDs of $P$-DEL and $I$-DEL (cf. section 10) are not met. However, it is of course possible to have two or more dependently conjoined series which are independently conjoined, as (90) shows:

(90) aKulg kula me n gaande, la aTene lebga me n di.  
Kulga/went home/me/and/go to bed/and/Tene/ went back/me/and/eat

'Kulga went home and went to bed, and Tene went back and ate.'

(90) has a deep structure like (89) where the sentential complements $S_1$ and $S_2$ are each the head of a dependently conjoined series.

The fact that $\text{la}$ conjoins all independently conjoined sentences regardless of whether or not their subjects are identical (point (g) above) and the fact that $\text{ti}$ is never used as a connective for independent conjunction (point (e) above) are accounted for because conjunction between performative verbs always involves identical subjects, i.e. the speaker noun. The identity or non-identity of the subjects of the sentential complements has no effect on conjunction of the matrix sentences. In the case of (89), LA INSERT attaches $\text{la}$ under the nodes $S_{Hn} \ldots S_{H2}$ and after all applications of HYPER-S-RED (60) the structure in (91) results:
(91)

(Note that HYPER-S-RED does not remove la.)

That independent conjunction does not undergo EQUI-NP-DEL (87) and ME TRANSPORT (cf. section 10 for the revised form)---points (c) and (e) above---comes about because it does not meet the SD of either rule, i.e. a non-initial sentence of an independently conjoined string is never right sister to VP, as (89) and (91) show.

There is one problem, however. Since LA INSERT is an optional rule, if it fails to operate on conjoined hyper-sentences, then EQUI-NP-DEL will automatically apply. Yet there is no sentence such as (92a) where n connects independent statements; but, on the other hand, in a given sequence of talk, an individual may utter two independent sentences which are not linked by any connector where the meaning is the same as two sentences connected by la, as (92b) illustrates.

(92) a) *akulg kula me n aTene gaanda me.

b) aKulg kula me, aTene gaanda me.

Kulga/went home/me/Tene/went to bed/me

'Kulga went home, Tene went to bed.'
I shall assume that (92b) is the result of conjunction of hypersentences where LA INSERT has not applied and where the second hypersentence has therefore undergone EQUI-NP-DEL; when HYPER-S-RED (60) operates, it will delete the connector n, which is inserted by EQUI-NP-DEL, along with the rest of the hypersentence.

As for the fact that the scope of the negative does not extend over more than one sentence in independent conjunction (point (h) above), this is explained by the fact that performative verbs, i.e. 'speech acts', cannot be negated, e.g. the following sentence is oddly anomalous: 'I do not hereby declare that this meeting is closed.' Thus the negative, like other non-performative [-ABSTRACT] verbs is confined to sentential complements of performative verbs.

Further (and more general) justifications of the above proposed deep structures for conjunction are presented in the subsections which follow.

7.3 Disjunction

Disjoint sentences in Mooré are connected by bi 'or' and have certain features in common with independent conjunction. First, identity versus non-identity of subjects is not marked, as (93) shows:

(93) a) aKulg_i kula me bi a_i gaanda me.

Kulga/went home/me/or/he/went to bed/me
'(Either) Kulga went home or he went to bed.'

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b) aKulg kula me bi aTene gaanda me.

Kulga/went home/me/or/Tene/went to bed/me

'(Either) Kulga went home or Tene went to bed.'

A second point that disjunction shares with independent conjunction is that all sentences in a string of disjoint declaratives must contain the particle me, as is illustrated in (93); there is no sentence like (94) where the bi clause is interpreted as a disjunction. 4

(94) *aKulg kula me bi aTene gaande.

Thirdly, all sentences in a string of disjoint declaratives must be marked for aspect. Thus in the sentences of (93) each verb is marked for perfective in accord with the tonal principles established in section 3.32. Fourth, disjoint sentences may not undergo EQUI-NP-DEL, as the unacceptability of (95) shows:

(95) a) *aKulg kula me bi gaanda me.

b) *aKulg kula me bi gaande.

and finally, the scope of negation never extends over more than a single sentence in a disjoint series, as (96) shows: 5

(96) a) aKulg pa kul ye bi a gaanda me.

Kulga/not/go home/ye/or/he/went to bed/me

'(Either) Kulga didn't go home or he went to bed.'

b) *aKulg pa kul bi a gaand (a me) ye.

From these similarities, at first glance it might be supposed that disjunction is related to independent conjunction, i.e. that it results from a disjoining of abstract

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performatives. However, there is an important difference between conjunction and disjunction with respect to performative utterances, namely that performative utterances or 'speech acts' may be conjoined but not disjoined. Thus in (97a) the connexion of performatives in both the Mooré sentence and the English gloss are acceptable while in (97b) the disjunction of the same performatives is unacceptable in both.

(97) a) m yeend f la me t’akulg kula me, la m yeend f la me t’a gaanda me.

I/tell/you/la/me/that/Kulga/went home/me/
and/I/tell/you/la/me/that/he/went to bed/me
'I (hereby) declare to you that Kulga went home
and I (hereby) declare to you that he went to bed.'

b) *m yeend f la me t’akulg kula me bi m yeend f la me t’a gaand a me.

'*Either) I (hereby) declare to you that Kulga went home, or I (hereby) declare to you that he went to bed.'

Of course disjunction may occur within the sentential complement of a performative, as (98) indicates.

(98) m yeend f la me t’akulg kula me bi a gaande me.

I/tell/you/la/me/that Kulga/went home/me/or/he/
went to bed/me
'I (hereby) declare to you that Kulga either went home or he went to bed.'

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In short, we may assert disjunctions, but we cannot disjoin our acts of assertion. If we do the latter, an odd and uninterpretable anomaly results, e.g. as in (97b). To my knowledge this fact has not been noted before, yet it is crucial to our understanding of the nature of disjunction.

Notice that while disjunction may occur within a sentential complement, independent conjunction does not. The sentence in (99a) is ambiguous: either it is an optional reduction of (99b) (i.e. gloss (1) of (99a)), which is in turn a reduction of the independently conjoined string in (99c) (cf. section 7.5 for the rules dealing with this sort of reduction), or it has the sense of gloss (2), where the la clause is independently conjoined in deep structure with the main clause verb of declaration and is an addition on the part of the speaker of the whole utterance to what Yamba said. (99d) shows that dependent conjunction may occur within a sentential complement.

(99) a) aYamb yeela me t'aKulg pro kula me la a pro gaande me.

Yamba/said/me/that/Kulga/went home/me/and/
he/went to bed/me

1) 'Yamba said that Kulga went home and (that)
he went to bed.'

2) 'Yamba said that Kulga went home, and (I--
'speaker'--say) he went to bed.'

b) aYamb yeela me t'aKulg kula me la t'a gaanda me.

Yamba/said/me/that/Kulga/went home/me/and/
that/he/went to bed/me

'Yamba said that Kulga went home and that he went to bed.'

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c) aYamb yeela me t'akulg kula me, la aYamb yeela me t'akulg gaanda me.

'Yamba said that Kulga went home, and Yamba said that Kulga went to bed.'

d) aYamb yeela me t'akulg kula me \{la a\} gaande

Yamba/said/me/that/Kulga/went home/me/and/
(he)/go to bed

'Yamba said that Kulga went home and went to bed.'

In the case of disjunction, there is a clear distinction in meaning between (100a), where only one complementizer ti is present, and (100b), where two complementizers are present (i.e. where as (99a) and (99b) are paraphrases, (100a) and (100b) are not). In (100a) the speaker of the utterance is reporting that Yamba uttered a disjunction concerning what Kulga did, i.e. the disjunction originates within the surface sentential complement; but in the case of (100b), the disjunction is asserted by the speaker of the utterance with respect to what Yamba said about Kulga and there is no implication that Yamba uttered the disjunction, i.e. the disjunction originates within the sentential complement of the matrix declarative hypersentence. (100b) is, then, a reduction of (100c).

(100) a) aYamb yeela me t'akulg kula me bi a gaanda me.

Yamba/said/me/that/Kulga/went home/me/or/
he/went to bed/me

'Yamba said that Kulga went home or went to bed.'
b) aYamb yeela me t'akulg kula me bi t'a gaanda me.

Yamba/said/me/that/Kulga/went home/me/or/
that/he/went to bed/me

'Yamba said that Kulga went home or that he went to bed.'

c) aYamb yeela me t'akulg kula me bi aYamb
yeela me t'akulg gaanda me.

Yamba/said/me/that/Kulga/went home/me/or/
Yamba/said/me/that/Kulga/went to bed/me

'(Either) Yamba said that Kulga went home or
Yamba said that Kulga went to bed.'

There is one further point about disjunction within
sentential complements which should be noted: disjunction
does not occur within complements of verbs of willing (cf.
section 5.4) or auxiliaries (cf. section 5.6), i.e.
[−LOCUTION,−INDEPEND] verbs, the same class of verbs whose
complements are subject to EQUI-NP-DEL (cf. (52) and (87)),
but it may occur within sentential complements of verbs of
declaration ('true' and 'mental') (cf. section 5.2), verbs
of command (cf. section 5.3), and verbs of perceiving (cf.
section 5.5). Thus the disjunctions in (101a,c) are accep-
table, while those in (101b,d) are not. (101e) shows that
dependent conjunction may occur within complements of verbs
of willing. (Although I have not given examples of auxili-
aries below, the same restrictions hold for them.)

(101) a) m data me n kul, bi m data me n gaande.

I/want/me/to/leave/or/I/want/me/to/go to bed

'I want to go home or I want to go to bed.'
b) *m data me n kul bi (n) gaande.
c) m data me 't'aKulg kul bi m data me 't'a gaande.
   I/want/me/that/Kulga/go home/or/I/want/me/
   that/he/go to bed
   'I want Kulga to go home or I want him to go
to bed.'
d)*m data me 't'aKulg kul bi a gaande.
e) m data me 't'aKulg kul n gaande.
   I/want/me/that/Kulga/go home/and/go to bed
   'I want Kulga to go home and go to bed.'

(101c) may be reduced to (102) by the principles established
in section 7.5.

(102) m data me 't'aKulg kul bi 't'a gaande.
   I/want/me/that/Kulga/go home/or/that/he/go to 
   bed
   'I want Kulga to go home or go to bed.'

It was noted in section 5.4 (28) that verbs of willing
may take an action nominal as an optional form of sentential
complement. Thus (101a) can be expressed as (103a), which
by the principles laid down in section 7.5 can be reduced
to (103b).

(103) a) m data kulb bi m data gaandgo.
   I/want/going home/or/I/want/going to bed
   'I want to go home or I want to go to bed.'
b) m data kulb bi gaandgo.
   I/want/going home/or/going to bed
   'I want to go home or go to bed.'
The above mentioned restriction on disjunction within sentential complements of verbs of willing etc. is not peculiar to Moore, but is probably a language universal. For example, by eliminating disjunction at the level of deep structure from within sentential complements of such verbs in English, we can account for the fact that the four sentences in (104) are paraphrases by positing that (104b,c,d) are reductions of (104a).

(104) a) I either want to go home or I want to go to bed.
   b) I either want to go home or go to bed.
   c) I want either to go home or to go to bed.
   d) I want to either go home or go to bed.

In the case of verbs of command and declaration, at the level of deep structure disjunction may occur within their sentential complements (e.g. 105a) as well as between matrix sentences (e.g. 105b) and this accounts for the sharp distinction in meaning between the English sentences in (105a,b):

(105) a) Bill told Harry to either go home or go to bed.
   b) Bill either told Harry to go home or (he told him) to go to bed.

Thus (105a) is not a reduction of (105b).

7.4 The Deep Structure for Disjunction

In providing an analysis for disjunction in Moore we have the following points from section 7.3 to account for:
   a) disjoined sentences take the connective particle bi; b) every sentence of a disjoint string of declaratives undergoes

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c) every sentence of such a string is marked for aspect, i.e. non-initial disjoint sentences are not subject to P-DEL; d) disjoint sentences are not subject to EQUI-NF-DEL; e) the scope of the negative never extends over more than a single sentence in a disjoint string; f) disjunction does not occur within complements of verbs of willing or auxiliaries, though dependent conjunction may; g) performative utterances may be conjoined but not disjoined.

Points (f) and (g) indicate that the context of occurrence of sentence disjunction is more limited than that of sentence conjunction. (There are certain other distinctions between the two which will be discussed in section 7.7.) Therefore I shall propose a deep structure for disjunction which is quite distinct from that proposed above for conjunction and which mainly limits disjunction to occurrence within verb complements. (The question of disjunction in relative clauses and factive nominalizations is discussed in section 7.6.) This is accomplished by a slight revision of the phrase structure expansion of VP given in section 5.9 (45), as shown in (106) below where the symbol Σ has been added.

\[(106) \text{PS 2'} \rightarrow \text{VP} \rightarrow \text{Vb (NP) (S)} \]

Then Σ is expanded into an infinitely iterable string of Ss (where '*' indicates infinite iterability). This is shown in (107) below:

\[(107) \text{PS 5') } \Sigma \rightarrow S S^*\]
This makes the claim that disjunction is an infinitely iterable \textit{conjoint} structure. (The question of depth branching in conjunction and disjunction is discussed in section 7.7.) Thus surface disjunctions (like those in section 7.3 (93)) have the base structure outlined in (108) where \( \Sigma \) is the complement of an abstract performative verb.

\begin{equation}
(108)
\begin{array}{c}
S_H \\
\downarrow \\
NP \\
\downarrow \\
\Sigma \\
\downarrow \\
S_1 \quad S_2 \ldots \quad S_n \\
\end{array}
\end{equation}

In order to account for point (a) above, i.e. the presence of \textit{bi} as a connector for disjunction, we must add the T rule BI INSERT shown in (109):

\begin{equation}
(109) \text{BI INSERT}
\begin{array}{c}
\text{SD: } X \left[ X S [ X \Rightarrow \\
\quad \frac{1}{2} \quad S_{n-1} \\
\right.
\text{SC: } 1, \text{bi}+2 \\
\end{array}
\end{equation}

\begin{equation}
\begin{array}{c}
X \\
\downarrow \\
\Sigma \\
\downarrow \\
X \quad S \quad S \quad X \\
\end{array}
\end{equation}

Given any pair of conjoint \( S_S \) under \( \Sigma \), this rule attaches \textit{bi} "or" as the leftmost constituent of the right member of the
pair. This constituent structure, as does that created by LA INSERT (88), reflects the fact that in speech such conjunctive particles group with the S which follows them, e.g. we can get a natural pause immediately before and and or but not immediately after.

The fact that every S of a disjoint string of declaratives contains the post verbal particle me (point (b) above) can be accounted for with only a slight alteration in ME INSERT as stated in section 5.10 (48). This is shown in the revision of ME INSERT in (110) below where the Vb to which me is added may be contained in an S which is directly dominated either by a VP headed by a [+INDEPEND] verb or by a Σ which is directly dominated by such a VP. (See convention (d) of section 5.10 for an explanation of the interpretation of variables in T rules.) As the trees below show, me is inserted in every S of a disjoint string (tree (a)), but only in the uppermost of a 'conjoined' string (tree (b)).

(110) ME INSERT (revised)

\[
SD: X \left[ \begin{array}{c} +\text{VERB} \\ +\text{INDEPEND} \end{array} \right] X \left[ \begin{array}{c} X \end{array} \right] X \left[ \begin{array}{c} a \\ \{S\} \end{array} \right] X \left[ \begin{array}{c} \Sigma \end{array} \right] X \left[ \begin{array}{c} \Sigma \end{array} \right] X \left[ \begin{array}{c} \Sigma \end{array} \right] X \left[ \begin{array}{c} \Sigma \end{array} \right] \Rightarrow
\]

\[
\begin{array}{c}
1 \\
2
\end{array}
\]

SC: 1+me, 2

Condition: a \neq ye
The rules TÍ INSERT (49), TÍ INSERT (53), and SUBJUNCT NEG (50) must undergo similar revision; the first two are altered to insure that the complementizers tí and tì are inserted only in the first S of a disjoint string. (For the revised version of these rules, see the final list of T rules in section 10.)

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As for points (c) and (d) above, i.e. that disjoint sentences undergo neither P DEL (51) nor EQUI-NP-DEL (52) and (87), nothing need be changed, since as presently stated these rules do not mention Σ and therefore exclude disjoint sentences from their range of application (i.e. by convention (d) of section 5.10).

The addition of the symbol Σ to VP means that there are two additional strict-subcategorization features: \([\dagger[\_\_\_NP \Sigma]]\) and \([\dagger[\_\_\_\Sigma]]\). The redundancy rules in (42) and (43) must be revised to include these features. Such a revision is shown in (lll) where \([-[\_\_\_\Sigma]]\) parallels \([-[\_\_\_\Sigma]]\) for verbs which are heads of three place predicates and \([-[\_\_\_\NP \Sigma]]\) parallels \([-[\_\_\NP S]]\) for verbs which are heads of two place predicates.

(l11) a) \([+\[\_\_\_\NP S]] \rightarrow \[-[\_\_\downarrow S]]\]
\[-[\_\downarrow \Sigma]]\]
\[-\text{STATIVE}]\]

b) \([+\[\_\_\downarrow S]] \rightarrow \[-[\_\_\downarrow \NP S]]\]
\[-[\_\downarrow \NP \Sigma]]\]
\[+\text{STATIVE}]\]

Note that these additional strict-subcategorization features enable us to exclude disjunction from complements of auxiliaries and verbs of willing (point (f) above) simply by marking verbs of these classes as \([+\[\_\_\downarrow S]], -[\_\downarrow \Sigma]]\).

('Mental' verbs of declaration and verbs of perception are marked \([+\[\_\_\downarrow S], +[\_\downarrow \Sigma]]\). From this the redundancy rule in (l12) is formulated; it states that all \([+\[\_\_\downarrow S], -[\_\downarrow \Sigma]]\) verbs are \([-\text{LOCUTION}, -\text{INDEPEND}]\):
(112) \[ *[\_S] ] \rightarrow [-LOCUTION] \\
-[
\_\_3] \rightarrow [-INDEPEND]

(For a final list of the redundancy rules, see section 10.)

The fact that the scope of the negative may extend over no more than a single S (point (e) above) is accounted for by the same strict-subcategorization feature marking that accounts for (f), i.e. the negative is an auxiliary and disjunction is therefore disallowed from its complement.

The structures for conjunction and disjunction proposed in the preceding pages enable us to define in a precise manner the context of occurrence for performative verbs. I shall assume that the definitions in (113) are part of the metatheory of generative grammar, though in some cases the actual terminology used may make too specific a reference to Moore'.

(113) a) A performative verb is any [+LOCUTION,-STATIVE] verb which is in the imperfective aspect/non-habitual present tense and has the speaker of the utterance (i.e. the addressee) as its subject and the hearer of the utterance (i.e. the addressee) as its NP object.

b) A performative verb may be contained only in an S which is directly dominated by: 1) the null element (i.e. it is the initial S), 2) a VP which is headed by a
[+LOCUTION,+REAL,+ABSTRACT] verb (i.e. it is either an 'explicit' performative or the matrix S for a direct quote), or 3) another S which contains a performative verb (i.e. it is 'conjoined' with a performative); and it may be contained in no S which directly dominates an S with a non-performative verb (i.e. performatives and non-performatives may not be 'conjoined').

c) The initial S of any base structure must contain a [+ABSTRACT] performative verb as its main verb (i.e. the initial S must be a hypersentence).

d) Any S which contains a [+ABSTRACT] verb cannot be directly dominated by an S which contains a [-ABSTRACT] verb and any S which contains a [-ABSTRACT] verb may not be directly dominated by an S which contains a [+ABSTRACT] verb (i.e. abstract and non-abstract verbs may not be 'conjoined').

(113a) offers a general definition of 'performative verb' which is similar to the definition of 'explicit' performative given in section 6.1 (58). (111b) defines the possible contexts in which performative verbs may occur within a given base structure; it restricts direct quotes and 'explicit' performatives to complements of 'true' verbs of declaration,

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e.g. we don't get sentences such as "I order you 'get out'."

In addition, (113b) accounts for the non-disjunction of performatives (point (g) above) in that it does not permit a performative verb to be contained in any S which is dominated by Z.

7.5 Conjunction and Disjunction of Noun Phrases

In Mooré there is a clear structural distinction between 'phrasal' conjunction of NP (i.e. deep structure NP conjunction, cf. Lakoff and Peters (1969)) and 'derived' NP conjunction (i.e. that which results from a reduction of sentence conjunction where all but the subject or object NPs of the underlying sentences are identical). The former utilizes the particle ne 'and WITH' as a connective and the latter uses là, the same conjunctive particle which is used to connect dependently conjoined sentences with identical subjects and all independently conjoined sentences. Phrasal conjunction indicates a joint, simultaneous, or reciprocal connection of the conjoined NPs with respect to the verb (i.e. whether as subject or object), while derived NP conjunction indicates that the conjoined NPs have individually or separately performed or undergone the same action. This is illustrated in the examples in (114).

(114) a) a Kulg ne a Tene kenga teng püge.

Kulga/and/Tene/went/town/stomach+in (i.e. 'to')

'Kulga and Tene went to town (together).'

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b) aKulg la aTene kēnga teng pỳgē

Kulga/and/Tene/went/town/stomach+in (i.e. 'to')

'Kulga and Tene (each) went to town.'

Verbs such as fào 'to collide' and pùli 'to mix' may take only phrasally conjoined subjects or objects, as (115) shows:

(115) a) aKulg ne aTene faoo taaba.

Kulga/and/Tene/collided/each other

'Kulga and Tene collided (with each other).'

b) aKulg la aTene faoo taaba.

c) m pula daam ne koom.

I/mixed/beer/and/water

'I mixed beer and/with water.'

d) m pula daam la koom.

On the other hand most stative verbs cannot take phrasally conjoined subjects, as (116) indicates:

(116) a) aKulg la aTene mì m kēema.

Kulga/and/Tene/know/my/elder brother

'Kulga and Tene know my elder brother.'

b) aKulg ne aTene mì m kēema.

For sentences with phrasally conjoined subjects like (114a) and (115a) there are related sentences like (117a,b) below where some member of the phrasally conjoined set appears in object position (and in some cases is preceded by ne).

(117) a) aKulg kēnga teng pỳgē ne aTene.

Kulga/went/town/'to'/with/Tene

'Kulga went to town with Tene.'

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b) aKulg fâoo aTene.

Kulga/collided/Tene

'Kulga collided with Tene.'

There is some argument as to whether or not the relationship between sentences such as (114a) and (117a) is transformational (cf. Stockwell, Schachter, and Partee Vol. I, p. 319 and ff.). Since this issue is not central to the present discussion I will not pursue it further. The point I wish to emphasize in examples (114) through (116) is that there is a formal distinction in Moore between phrasal and derived NP conjunction.

As for the base structure of phrasal conjunction, I shall adopt a solution which is essentially that proposed by Lakoff and Peters (ibid.) where the phrase structure source is a sub-part of the PS rule for NP which generates a recursive and infinitely iterable conjoint structure, i.e.

NP → NP NP* (for the incorporation of this rule into the general expansion of NP, cf. section 10); in addition there is a rule NE INSERT which adds ne between conjoint NPs (cf. section 10 for the actual formulation). Phrasal conjunction will not be dealt with further in this section, though there is some additional mention of it in the discussion of depth branching in conjunction in section 7.7.

In addition to the two types of NP conjunction mentioned above, there is also disjunction of NPs where two or more NPs are connected by the sentential disjunctive particle bi, as the sentences in (118) show:

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(118) a) aKulg bi aTene kula me.
Kulga/or/Tene/went home/me
'Kulga or Tene went home.'

b) a yāa aKulg bi aTene.
he/saw/Kulga/or/Tene
'He saw Kulga or Tene.'

I shall analyze 'derived' NP conjunction as a reduction
of independently conjoined sentences (i.e. deep structure
conjunction of hypersentences as proposed in section 7.2
(89)), while I shall claim that NP disjunction always results
from reduction of disjoined sentences (i.e. from a deep
structure like that in section 7.4 (108)). Note that de-
pendent conjunction does not undergo reduction to surface
NP conjunction and therefore there is no sentence like (119b)
which is derived from (119a):

(119) a) aKulg kula me `t'aTene kuli.
Kulga/went home/me/and/Tene/go home
'Kulga went home and then Tene went home.'

b) #aKulg `t'aTene {kula me.} {kuli.

In English it seems that we can get such a reduction when
'then' is present, e.g. 'Kulga, and then Tene, went home.'

Since disjunction and independent conjunction of sen-
tences undergo reduction to NP disjunction and conjunction
respectively, in the interest of generality it is desirable
to handle both types of reduction with the same rule. How-
ever, due to the fact that disjunction originates as a
conjoint structure and independent conjunction as a right branching structure, the two will have different surface structures. Disjunction will have that shown in (120a) and independent conjunction, after HYPER-S-RED (60), will have that shown in (120b):

\[(120) \text{a) } \Sigma \text{ b) } S_1\]

\[S_1 \quad S_2 \quad S_1 \quad S_2 \quad S_3 \quad S_4 \]

\[\text{bi} \quad \text{NP} \quad \text{VP} \quad \text{la} \quad \text{S} \]

(120b) is a reduction of (89) in section 7.2 where $S_1$ and $S_3$ of (120b) correspond to $S_{H1}$ and $S_{H2}$ respectively of (89) and $S_2$ and $S_4$ of (120b) correspond to $S_1$ and $S_2$ of (89).

I shall propose that there is a rule (or perhaps it is a readjustment convention) called CONJ-PARTICLE-ADJUST, which reduces right branching structures like (120b) to true conjoint structures by attaching la as the leftmost constituent of the S which follows it.

This is exemplified in the trees under (121); in the tree on the right, the non-branching $S_3$ node has been pruned. (Note that $\Sigma$ is mentioned in the rule, since it is possible that sets of disjoint Ss may be independently \textit{conjoined}.

\[(121) \text{ CONJ-PARTICLE-ADJUST} \]

\[
\begin{align*}
\text{SD:} & \quad X \begin{array}{c}
\frac{\text{bi}}{1} \\
\frac{\text{la}}{2}
\end{array} \begin{array}{c}
\frac{\Sigma}{3} \\
\frac{\text{NP} \ X}{4}
\end{array} \\
\text{SC:} & \quad 1, \emptyset, 3, 2+4
\end{align*}
\]
The mention of bi in the above rule refers to cases of derived disjunction of sentential complements, e.g. (100b), which arises from the application of DER-COMP-CONJ (123); in such cases bi ends up outside of the S which follows it. (121) rectifies this.

It is now possible to accomplish the reduction to derived NP conjunction and disjunction in the same operation, since, after application of CONJ-PARTICLE-ADJUST, independently conjoined sentences (like disjoint sentences) are all sisters under a single node. In (122) below is the rule for derived conjunction of NP subjects, i.e. where all but the subjects are identical, as is described in the conditions on (122):

(122) DER-SUBJ-CONJ (optional)

\[
SD: \quad X \left[ \begin{array}{cccc}
  a & b & c \\
  S_1 & NP & VP (S) & S_1 \\
  1 & 2 & 3 & 4
\end{array} \right] \begin{array}{c}
l_a \\
  la \\
  S_1 \\
  5
\end{array}_{\text{bi}} \quad \left[ \begin{array}{cc}
d & e \\
  S & NP \quad VP (S) \quad X
\end{array} \right] \Rightarrow
\]

\[
SC: \quad 1, \emptyset, \emptyset, 4, 2+5
\]

Conditions:
1) \( a > \{ l_a \}_{\text{bi}} \) (NP \( \{ l_a \}_{\text{bi}} \)) or \( \emptyset \)
2) \( b \neq d \)
3) \( c = e \)

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In addition to conjoined and disjoined subjects, sentences may also have derived conjunction and disjunction of complements. The rule which produces this reduction is given in (124) below. Note that a complement may be an NP or a sentential complement (i.e. S or ξ) and this is indicated in the rule; the subscript on the curly brackets is a convention borrowed from phonology (cf. section 1) which indicates that the conjoined or disjoined elements must be of the same type, i.e. all NPs or all sentential complements, so that we don't get sentences like: *m data me t'akul la nemdo.' 'I want Kulga to leave and meat.' For an example of derived conjunction of sentential complements, cf. section 7.3 (99a,b).

(123) DER-COMP-CONJ (optional)

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP</td>
<td>S</td>
<td>NP</td>
<td>S</td>
<td>X</td>
</tr>
</tbody>
</table>

SD: X \left[ \frac{a}{NP X} \right] \left[ \frac{b}{\{NP, S\}} \right] \left[ \frac{c}{VP S} \right] \left[ \frac{d}{\{NP, S\}} \right] \left[ \frac{e}{X} \right] X \Rightarrow

1 2 3 4 5 6

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SC: $1+3+5, 2, \emptyset, 4, \emptyset, 6$

Conditions: 1) $a = c$

2) $b \neq d$

3) $e = \left\{ \frac{la}{bi} \right\} \left\{ \frac{NP}{S} \right\} \left\{ \frac{la}{bi} \right\}^* \text{ or } \emptyset$

Then there is a rule (or, again, perhaps it is a convention) which operates on the output of (122) and (123) and groups the conjoined or disjoined under a single node. Such a rule is presented in (124) below:

(124) DER-CONJ-ADJUST

\[
\begin{array}{c}
\text{SD: } X \left\{ \frac{Vb}{S} \right\} \left\{ \frac{NP}{S} \right\} \left\{ \frac{la}{bi} \right\}_i \left\{ \frac{NP}{S} \right\}_j \left\{ \frac{la}{bi} \right\}_i^* \left\{ \frac{VP}{S} \right\} \left\{ \frac{VP}{S} \right\}_j \left\{ \frac{VP}{S} \right\}_i \\
1 & 2 & 3
\end{array}
\]

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The subscripts on the curly brackets (cf. the phonological conventions in section 1) in DER-CONJ-ADJUST assure that the correct brackets will be put on the conjoined constituents, i.e. NP for conjoined and disjoined NPs, S for conjoined Ss and SegueS, and Segue for disjoined Ss and SegueS (e.g. see the trees above). In the case of derived conjoined and disjoined Ss and SegueS, CONJ-PARTICLE-ADJUST (121) will reapply and attach the conjunctive particles la and bi as constituents of the following S. The asterisque after the last curly brackets
of 2 in the SD indicates that there may be an infinite string of conjoint elements.

In a negative sentence which has a derived conjoined or disjoined complement, if the indefinite negative particle ye is present, it encloses the entire conjoint, as (125) illustrates.

(125) a)  a ka nong nemd la kul-deoog ye.
    he/not/like/meat/and/fish/ye
    \{ 'He likes neither meat nor fish.' \\
    'He doesn't like meat and fish.' \}

(b) a ka nong nemd bi kul-deoog ye.
    he/not/like/meat/or/fish/ye
    'He doesn't like meat or fish.'

(125a,b) are reductions of (126a,b) respectively:

(126) a)  a ka nong nemd (ye) la a ka nong kul-deoog ye.
    he/not/like/meat/(ye)/and/he/not/like/
    fish/ye
    'He doesn't like meat and he doesn't like fish.'

(b) a ka nong nemd (ye) bi a ka nong kul-deoog ye.
    he/not/like/meat/(ye)/or/he/not/like/fish/
    ye
    '(Either) he doesn't like meat or he doesn't like fish.'

YE-MOVE (55) occurs after DER-COMP-CONJ (123) and DER-CONJ-ADJUST (124) and thus ye of the unreduced Vb in the leftmost S is moved around the entire derived conjoint complement.
It is interesting to note that Moore avoids an ambiguity which arises in English as a result of substitution of 'or' for 'and' after a negative. Thus the Moore sentence in (125b) is unambiguous and has only the sense of (126b), while the English gloss for (125b) is ambiguous with the sense of (126a) or (126b). (For further comments on this phenomenon and its relationship to DeMorgan's law, cf. note 5 in section 7.8.)

7.6 **Conjunction and Disjunction and sê Clauses (sentences dominated by NP)**

In Moore, subordinate clauses which are dominated by NP contain the particle sê in the position between the subject and the predicate and the definitizer wâ appears at the end of the clause (except in relative clauses with indefinite antecedents, where wâ is not present). The post-verbal particle me is never present in sê clauses, but the principal verb is always marked for aspect, i.e. P-DEL does not apply to the main verb of a sê clause. (Since me does not occur in sê clauses, the complement marker -a- -la always elides—cf. section 3.30; for evidence of the presence of perceptive which also elides in most cases, cf. section 3.32—the arguments presented there apply to all sê clauses.) Sê clauses are of two basic syntactic types: factive nominalizations and relative clauses. For the most part I shall use relative clauses to illustrate the points about sê clauses which are germane to the discussion of conjunction and disjunction,
though I shall have occasion to point out certain differences between relatives and factives with respect to disjunction. (For an illustration of factive nominalization cf. (d) of note 7 in section 5.11.)

In addition to the general facts mentioned above, relative clauses with definite antecedents show the following characteristics: the antecedent noun is followed by the determiner ningga (sg.)/nisì (pl.) and the identical noun in the relative clause is pronominalized and permuted to post-verbal position, as (127a) shows.\textsuperscript{7} If the relativized noun is a direct object, the noun sòbá (sg.)/sòb dámbá (pl.) ('possessor') is optionally inserted in its place (cf.(128b)).\textsuperscript{8}

(127) a) \textit{dáp_{i} nisì sě ta b_{i} zaamé wā kula me.}

\textit{Men_{i}/nisì/sě/arrived/they$_{i}$/yesterday/wā/}
\textit{have gone home/me}

'The men who arrived yesterday have gone home.'

b) \textit{daw_{i} ningga fo sě yā a_{i} (sob) zaamé wā kula me.}

\textit{Man_{i}/ningga/you/sě/saw/him$_{i}$/soba/yesterday/wā/has gone home/me}

'The man who you saw yesterday has gone home.'

I shall not provide rules for these points, rather I present them here to aid the reader in interpreting the surface structure of relatives.

The principal point of interest in sě clauses with respect to conjunction and disjunction is the behavior of sě

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and the final definitizer \( \overline{w} \). \( \overline{s} \) behaves like the particle \( \overline{me} \) in conjoined declaratives in that it appears only in the first of a dependently conjoined series; there may also be only one \( \overline{w} \) per dependently conjoined series, and it must come at the end of the entire series. Also note that the pronoun is permuted to post-verbal position only in the first \( S \):

\[
\begin{align*}
(128) & \quad \text{a) } \text{daw}_i \text{ ninga } \overline{s} \text{ yil } a_i \text{ \{la a}_i \} \text{ sao w} \overline{a} \ldots \\
& \quad \text{man}_i/\text{ninga}/**/\text{sang/he}_i/\text{and/(he}_i)/\text{danced/w} \overline{a} \ldots \\
& \quad '\text{The man who sang and danced...}' \\
& \quad b) \quad \text{daw}_i \text{ ninga fo } \overline{s} \text{ ppus a}_i \text{ sob t'a}_i \text{ kō f} \\
& \quad \text{daam w} \overline{a} \ldots \\
& \quad \text{man}_i/\text{ninga}/you/**/\text{greeted/him}_i/\text{soba/and/} \\
& \quad \text{he}_i/\text{gave}/you/\text{beer/w} \overline{a} \ldots \\
& \quad '\text{The man whom you greeted and who then gave you beer...}' \\
& \quad c) \quad \#\text{daw}_i \text{ ninga s} \overline{e} \text{ yil a}_i \text{ la a}_i \text{ s} \overline{e} \text{ sao w} \overline{a} \ldots \\
\end{align*}
\]

Thus we can formulate a general rule, \( \overline{s} \) \( \overline{\text{INSERT}} \), which inserts \( s \) as right sister to the subject \( \overline{NP} \) of any \( S \) which is immediately dominated by \( \overline{NP} \) (i.e. it is a factive nominalization) or which is right sister to \( \overline{\text{NOM}} \) under \( \overline{\text{NOM}} \). Such a rule is given in (129) below; it will operate only on the first (i.e. the highest) \( S \) of a dependently conjoined series:

\[
(129) \quad \overline{s} \overline{\text{ INSERT}}
\]

\[
\begin{array}{c}
\text{SD: } X \left\{ \begin{array}{c}
\text{NOM} \\
\text{NP} \\
\end{array} \right\} \left\{ \begin{array}{c}
[ NP X ] \\
S \\
\end{array} \right\} X \Rightarrow \\
\end{array}
\]

\[
\begin{array}{c}
1 \quad 2 \\
\end{array}
\]

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This rule operates essentially like ME INSERT; note that ME INSERT (cf. (110) in section 7.4) will not operate on relative clauses or factive nominalizations because its operation is restricted to S dominated by VP, while SÊ INSERT will not operate on sentential complements because it is restricted to S dominated by NOM or NP. The fact that wā occurs only at the end of a conjoined series is accounted for by the configuration of NP, as shown in the tree on the right above. (Presumably there is a readjustment rule which removes the determiner wā from NP and attaches it as right sister to the last word of the relative clause, since it merges like a suffix with that word in the surface—cf. section 3.17.)

Relative clauses may also be independently conjoined or disjoined in which case each member of the string contains sē and wā and the pronoun is permuted to post-verbal position in each S of such a string.
(130) a) dawᵊ ninga sé yɪl aᵊ wɑ la sé sao aᵊ wɑ ...

\( \text{man}_i/\text{ninga/sé/sang/he}_i/\text{wɑ/and/sé/danced/} \)

heᵊ/\text{wɑ}/...

'The man who sang and who (also) danced...'

b) dawᵊ ninga sē na n yɪl aᵊ wɑ bi sē na n sao aᵊ wɑ ...

\( \text{man}_i/\text{ninga/sé/is going/to/sing/he}_i/\text{wɑ/or/} \)

sē/is going/to/dance/heᵊ/\text{wɑ}/...

'The man who is going to sing or (who is going to) dance...'

Without the identity marker subscript \( i \) the above sentences are ambiguous because the pronoun meaning 'the one' is zero in Mooré, and therefore (130a,b) can also have the respective meanings: 'The man who sang and the one who danced...' and 'The man who is going to sing or the one who is going to dance...' where the subjects of the two sentences are of the same type, i.e. men, but not necessarily identical, i.e. the same man.

I shall propose that surface independently conjoined and disjoined relative clauses are derived from independently conjoined and disjoined sentences which have been reduced to derived NP conjunction and disjunction as outlined in section 7.5 (cf. the rules in (121) through (124)). Thus the sentences in (130a,b) have a stage in their respective derivations which corresponds to the tree below the rule in (131), which reduces identical NOM nodes in conjoined or disjoined NPs and attaches the intervening conjunctive particle plus the remaining relative clause along with any string
of conjoint relative clauses created by previous applications of (131) (cf. condition 2) as a constituent of the NOM node of the preceding NP; it is assumed that determiner (D) has been moved from NP down into the relative clause before this rule (cf. the comments following (129) above).

\[(131) \text{ NOM-RED} \]

\[
\begin{array}{c}
SD: \quad X \quad \text{NOM} \quad S \quad ] \quad \text{la} \quad \text{bi} \quad ] \quad \text{NOM} \quad \text{NP} \quad \text{NP} \quad \text{NOM} \quad \text{NOM} \\
1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7
\end{array}
\]

\[
\text{SC: } 1+3+6, \ 2, \ \emptyset, \ 4, \ \emptyset, \ \emptyset, \ 7
\]

\[
\text{Conditions: } 1) \ a = b \\
2) \ c = \text{la} \text{bi}S^\# \text{ or } \emptyset
\]

CONJ-PARTICLE-ADJUST (121) will apply to the output of NOM RED (e.g. the tree on the right above) and attach the conjunctive particle as a constituent of the S which follows it.
This solution provides a convenient way out of an otherwise difficult problem by utilizing a type of ungrammatical sentence which the grammar of English as well as that of Mooré will generate and which cannot be blocked except by some extremely ad-hoc restriction for which I have seen no formulation. Thus, in English, for example, without a rule similar to (131), sentences like (132a,b) will be generated because conjunction reduction operates on identity between major constituents such as NP and VP, etc. In the case of (132), both sentences have undergone the English equivalent of DER-SUBJ-CONJ (122); the conjoined and disjoined NPs are not identical, but the head nouns are.

(132) a) *The man₁ who sang and the one₁ who danced are my friends.
   b) *(Either) the man₁ who is going to sing or the one₁ who is going to dance has arrived.

Of course something superficially similar to (132a) occurs in assertions of identity like that in (133a), which I shall claim originates as deep structure phrasal conjunction. Note that there is no such equivalent for disjunction, as (133b) shows.

(133) a) The man₁ who sang and the one₁ who danced are (one and) the same man.
   b) *The man₁ who is going to sing or the one₁ who is going to dance is the same man.
These facts provide independent support for our analysis of disjunction as originating from a different source (i.e. \( \Xi \)) than conjunction. The argument is as follows. Conjunction may occur either within a relative clause, i.e. a single relative clause containing a dependently conjoined series as in (128a), or between two or more separate relative clauses, i.e. derived from independently conjoined NPs as in (130a). But with respect to disjunction there is no contrast between disjunction within a single relative clause as opposed to that between two separate relative S, i.e. (130b) is unambiguous in this respect and it has no counterpart like (134) below, which would be analogous to (128a):

\[(134) \text{ *daw}_{i} \text{ nginga se na n y}^{i} \text{ il a}_{i} \text{ bi a}_{i} \text{ na n sao wā ...} \]

Therefore sentences such as (130b) (both in Mooré and in English) must be assigned only one possible deep structure. Yet if we accept the above proposed analysis and at the same time keep the traditional generative view of conjunction and disjunction as being generated by the same PS rule (i.e. \( S \rightarrow S \) and/or \( S^* \)) then there is no way to prevent disjunction within relative clauses, and sentences such as (130b) will incorrectly be assigned two possible deep structures. On the other hand, by accepting the notion of disjunction as being generated under the node \( \Xi \) as proposed in section 7.4, we need make no changes or add any special restrictions because the PS expansion for relatives as given in section 5.9 (46: PS 36) automatically excludes disjunction within a
relative clause because it expands relative clause only as S, which will permit internal dependent conjunction, and not as Σ. (Note that this expansion also disallows disjunction within manner/action nominals.)

Before finishing with relative clauses, I should mention that two or more relative clauses may appear in a string with no conjunctive particles connecting them. In such a construction the clauses are said to be 'stacked', since each clause takes as its antecedent the original head noun plus all the intervening relatives. An example is shown in (135).

(135) daw₁ ninga sê koosd a₁ ki (wâ) fo sê pûus a₁ sob zaamê wâ ...

man₁/ninga/sê/sells/he₁/millet/(wâ)/you/sê/
greeted/him₁/soba/yesterday/wâ ...

'The man who sells millet who you greeted yesterday...'

Note that every clause in a stacked series must contain sê, but only the last must contain wâ, though the others may optionally do so. Thus presumably there is an optional wâ spreading rule which copies wâ in the inner clauses. I shall not deal further with 'stacked' relatives in this work. (For a detailed discussion of this construction see Stockwell, Schachter, and Partee (1968), Vol. 1, pp. 445 and ff.)

Finally, we have seen that disjunction does not occur within relative clauses, but what of the other type of sê
clause, factive nominalizations. Unfortunately I have not investigated this point in Moüre, but judging from what occurs in English, it would seem that disjunction both within and between factives is permissible, as (136) shows. The meaning of the (a) and (b) sentences is quite distinct.

(136) a) The fact that either Bill or Harry was involved in the theft upset Martha.

b) Either the fact that Bill was involved in the theft or the fact that Harry was involved in it upset Martha.

This can be accounted for by formulating the expansion for factive nominal as in (137a); (137b) gives the final form for the expansion of NP with (137a) incorporated in it.

(137) a) \[ NP \rightarrow \begin{cases} S \\ \Sigma \end{cases} \]

b) PS 3a') \[ NP \rightarrow \begin{cases} NP \ NP^* \\ NOM \ D \\ S \ \Sigma \end{cases} \]

7.7 Some General Remarks on Conjunction and Disjunction in Generative Grammar

The view of conjunction and disjunction presented in the preceding sections is quite different from that of traditional generative grammar in that it makes a sharp distinction between the two, both configurationally and distributionally; I have also pointed out how the performative analysis can account for certain inadequacies which the traditional view cannot, such as the fact that disjunction does not occur within complements of verbs of willing or relative clauses. In this section I shall point out some other general
inadequacies of the traditional view and show that the approach adopted in this work can handle them as well as all those facts already accounted for by the traditional view.

First, there is the question of nesting (i.e. depth branching) in sentence conjunction. The usual rule for sentence conjunction, \( S \rightarrow S \) and \( S^* \), predicts that sentence conjunction may be infinitely nested, in which case structures like that in (138) will be generated:

\[
\text{(138) a) } S \\
\quad S \text{ and } S \\
\quad S \text{ and } S_3 \text{ and } S_4 \text{ and } S_5 \\
\quad S_1 \text{ and } S_2
\]

\[
\text{b) } S \\
\quad S \text{ and } S_3 \text{ and } S_4 \text{ and } S_5 \\
\quad S_1 \text{ and } S_2 \\
\quad S_4 \text{ and } S_5
\]

The analysis of conjunction as a right branching recursive structure combined with the notion of dependent versus independent conjunction (i.e. conjunction of hypersentences) also permits nesting, but of a more limited sort, that is there may be dependent conjunction within the conjoints of an independently conjoined string, as indicated in (139) below. (Note that (139) has undergone HYPER-S-REDUCTION.)

\[
\text{(139) } S_0 \\
\quad S_1 \text{ NP VP } S_2 \text{ and } S_3 \text{ NP VP } \text{ and } S_4 \text{ NP VP } \text{ and } S_5 \text{ NP VP}
\]

(For an example in Moore, see section 7.2 (90).)
I know of no example from English or any other language which demonstrates the necessity of a structure with the degree of nesting of that in (138a) as an underlying structure. In other words, I do not believe that there is an utterance consisting of five conjoined sentences, $S_1$-$S_2$-$S_3$-$S_4$-$S_5$, which is at least two ways ambiguous where one interpretation is that represented by (138a). The lack of any such example demonstrates that the traditional expansion rule for conjunction is deficient by reason of being too powerful in that it generates base structures for which there are no interpretations. The proposal put forth in this work provides the proper constraint on nesting of conjoined strings in sentence conjunction: it does not permit such nesting at a depth greater than one, as in (139) where the strings $S_1$-$S_2$ and $S_4$-$S_5$ are nested in the string dominated by $S_0$. (Notice that the grouping represented by (139) is analogous to that in (138b).)

The rule for phrasal conjunction, $NP \rightarrow NP \; NP^*$, will generate infinitely nested structures; nesting of some sort in phrasal conjunction is indicated in both Moore and English by pause groups (marked by commas) as the example in (140a) shows. (140b) shows the structure of the conjoined subject of (140a).

(140) a) aKulg ne a pagã, ne aTene, ne aYamb ne a pagã kënga teng pûgê.

'Kulga and his wife, and Tene, and Yamba and his wife went to town.'
b)  
NP
   /
  /  
NP ne NP
  /
 /  
NP ne NP
  /
 /  
 aKulga a paga
  /
 /  
 aTene
  /
 /  
aYamba
  /
 /  
a paga

It is difficult to determine if nesting to a degree greater than one occurs in phrasal conjunction; I did not push my investigations in Mooroé this far. However, the conjoint subject of the English sentence in (141a) seems to be open to at least two interpretations as shown in (141b,c); (141b) has a level of nesting greater than one.

(141) a) John along with George and his wife and Joe went to the movies together.

b)  
NP
   /
  /  
NP and NP
  /
 /  
NP along with NP Joe
  /
 /  
 John
  /
 /  
 NP and NP
   /
   /  
 George his wife

c)  
NP
   /
  /  
NP along with NP
  /
 /  
NP and NP and NP
  /
 /  
 NP and NP and NP
    /
    /  
 George his wife Joe

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With respect to disjunction, there is some evidence in English that nesting of disjoint strings to a depth greater than one may occur. Because sentences involving such structures are generally confined to a special type of logical/mathematical talk, a type of discourse which is not well developed in Moosé culture, I was not able to test it out in the Moosé language. The sentence in (142) illustrates this, where small letters are used in place of sentences:

\[(142) \text{ Either either a or b, or c; or either x or y, or z.}\]

But given the expansion of $\Sigma$ proposed in section 7.4 (107) (i.e. $\Sigma \rightarrow S S^*$) as the source for disjunction, sentences like (142) cannot be generated, because there is no provision for nesting. However, it is an easy matter to make such a provision by adding $\Sigma$ as a recursive symbol in the expansion of $\Sigma$, as in (143):

\[(143) \Sigma \rightarrow \{S\} \{S\}^* \]

This will provide the structure in (144) as a base for (142) where or has been obligatorily inserted by rule and either is optionally inserted at the head of any string dominated by:

\[(144)\]

[Diagram]

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The system proposed in this work does, of course, provide for cases where a conjoined series is nested within a member of a disjoint string, as the base structure in (145) indicates:

\[(145)\]

But it does not permit the embedding of a disjoint string as a member of a dependently conjoined series, e.g. as in the structure in (146):

\[(146)\]

Yet the English example in (147a) below where both members of the disjoint pair are subordinate to the first sentence seems to have a structure like that in (146). But (147a)
has a paraphrase in (147b), and the two must be related in deep structure. This is accomplished by assigning (145) as the deep structure underlying both (147a) and (147b); (147a) is then a reduction of (147b).

(147) a) Kulga went home and then (either) ate or went to bed.

   b) (Either) Kulga went home and then ate or (he) went home and then went to bed.

It is interesting to note that a direct translation of (147a) into Mooré is not possible, as the unacceptable sentence in (148a) shows. The idea must be expressed as (148b), which corresponds to (147b), or as (148c), where the disjoint sentences appear as main clauses and the first sentence appears as a time adverbial. (We can assume that an identical time adverbial has been deleted from the second of the disjoint main clauses; as we shall see in section 8.1 there is a close relationship between sentential time adverbs and dependent conjunction.) The lack of a sentence like (148a) in Mooré as correspondent to (147a) in English means that English has certain reduction rules which Mooré does not; I shall not specify these here.

(148) a) *aKulg kula me la a dį bi a gaande.

Kulga/went home/me/and/he/eat/or/he/go to bed

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b) aKulg kula me n dį bi a kula me n gaande.

Kulga/went home/me/and/eat/or/he/went home/
me/and/go to bed

'Kulga went home and ate or he went home and
went to bed.'

c) aKulg sē kulā poorē, a dįi me bi a gaanda
me.

Kulga/sē/went home+wā/after/he/ate/me/or/
he/went to bed/me

'After Kulga went home, he either ate or
went to bed.'

The new system proposed in these pages also permits a
sentence like (149) where the first S is independently
conjoined with the disjoint pair; the structure for this
type (after HYPER-S-RED) is shown in (150).

(149) aKulg kula me la a dįi me bi a gaanda me.

Kulga/went home/me/and/he/ate/me/or/he/went
to bed/me

'Kulga went home, and he ate or he went to
bed.'

(150)
The performative view of conjunction and disjunction makes the claim that a sentence such as (149) (where the 'and' is one of independent conjunction) is not ambiguous. As far as I can determine this is true for Moore; such a judgement is more difficult in English because the division between dependent and independent conjunction is not structurally as clear, and thus the English gloss for (149) is ambiguous because the 'and' may be interpreted as either dependent or independent.

In addition to making a distinction between dependent and independent conjunction, the analysis revealed in the preceding pages makes a sharp configurational division between conjunction and disjunction. Such a division is justified by certain important semantic differences, over and above the specific structural arguments already mentioned. First, conjoined sentences (both dependent and independent) are always sequentially enumerable, i.e. we can assign an ordinal number first, second, ... etc. to each member of a conjoined string. Such is not the case with disjunction, as the examples in (151) show. (Though the examples are in English, they hold for Moore and other languages as well.)
(151) a) First Joe opened the door and (then) second he turned on the light and (then) third ... etc.

b) First, (I say) Harry is an idiot, and (then) second, (I say) Alphonse is incompetent, and (then) third ... etc.

c) *First Joe opened the door or (then) second he turned on the light or (then) third ... etc.

d) *First, Harry is an idiot, or second Alphonse is incompetent, or third ... etc.

Sequential adverbs such as 'then', 'next', etc. behave similarly to the ordinal numbers in that they may occur with conjoined strings but not disjoined strings. The application of ordinal numbers in language is closely involved with the expression of an ordered sequence of actions such as occurs in conjunction (whether it be 'speech acts', i.e. conjunction of hypersentences, or a reported sequence, i.e. 'dependent' conjunction), but not in disjunction. The unacceptability of all the sentences in (152) below results from the same thing: violation of sequential constraints.

(152) a) *Fourth, Art is a bastard, second he's incompetent, first he's insulting, and third...etc.

b) *Then Gaston opened the door and first he turned on the light.

c) *Gaston ate the meat and then he cooked it.

These constraints can be characterized in terms of a relation of non-reversible inclusiveness: just as 'second' is inclusive of 'first', 'third' is inclusive of 'second' etc. (152a), so 'then'/'next' is inclusive of 'first' (152b), and
the 'eating' of something is inclusive of its 'cooking' (152c). (Of course the difference between the relation between consecutive ordinals and that between actions is that in the former case 'third' is necessarily inclusive of 'second', where as in the latter the 'eating' of something is not necessarily inclusive of its 'cooking'.)

This tempers Staal's (1968) statement mentioned in section 7.1 that independent conjunction is symmetric, since any such string can be made asymmetric by assigning ordinal numbers to its members. In natural language, then, only disjunction is truly symmetric. The notion of asymmetry between propositions (that is where a reversal of positions may result in a change in meaning or a violation of sequential constraints) versus symmetry between propositions (that is where reversal of position does not change meaning or violate a sequential constraint) is central to our understanding of the idea of 'subordinate' versus 'coordinate' structure. In general we can characterize subordinate structures as asymmetric and coordinate structures as symmetric. From this point of view the generation of 'conjunction' sentences as a right branching recursive structure (i.e. as subordinate clauses) and of disjunction of sentences as a coordinate structure is wholly appropriate. The traditional view, where both structures are configurationally identical, fails to capture this.

Another point which divides conjunction from disjunction is the fact that there is a type of presuppositional relation
that holds between the members of a conjoined pair of sentences which does not hold between the members of a disjoined pair. This relation is asserted in English by the use of the conjunctive adverb too/also, whose negative reflex is either. For each pair of sentences in (153a,b,c,d) below the top one is a conjoined sentence with too/also in the right member and the sentence immediately beneath it in parentheses is the presupposition which underlies it. In each case the relation that holds is that the predicate of the left member of the conjoined pair is identical to the subject of the presupposition and the predicate of the right member is identical to the complement of the presupposition.

(153) a) Harry is a bachelor and Joe
    \[\text{is an unmarried man too.}\]
    \[\text{has never been married either.}\]

    (A bachelor is \{an unmarried man.\}
    \{a man who has never been married.\}

b) Harvey left and then Mary also departed.
    (To leave is to depart.)

c) Alphonse left at three o'clock and Pierre left early too.
    (To leave at three o'clock is to leave early.)

d) Alice plays the trombone well and Mike is a good musician too.
    (To play the trombone well is to be a good musician.)

The relation between the subject and predicate of the presupposition for (153d) is irreversible because the latter
is inclusive of the former but not vice versa, e.g. 'All trombone players are musicians' ≠ '*All musicians are trombone players.' This same irreversibility shows up in conjoined sentences with too, as (154) illustrates.

(154) *Mike is a musician, and Alice is a trombone player too.

(*A musician is a trombone player.)

The use of the conjunctive adverbs is prohibited if the predicates of the two conjoined sentences are contradictory, that is if they contain elements in their respective semantic contents which are incompatible. The unacceptability of the top sentence in each of the pairs in (155a,b) can be traced to the contradiction in the presupposition immediately below it.

(155) a) *Harry is a bachelor, and Joe is a married man too.

(*A bachelor is a married man.)

b) *Harvey left and then Mary didn't depart either.

(*To leave is to not depart.)

These presuppositional properties are not present in disjunction as the unacceptability of (156) shows:

(156) *Either Harry is a trombone player or Jack is a musician too.

Therefore conjunctive adverbs never occur with disjunction.

Once again, then, the members of a conjoined string share properties and relations not shared by the members of a disjoint string. In this case the predicates of two
conjoined sentences bear the same semantic relationship to each other as do the subject and predicate nominal of a corresponding copular sentence (i.e. the presupposition). It is interesting to note that given the analysis of conjunction presented in these pages, the configurational relation of the predicates of two conjoined sentences is similar to that of the subject and predicate nominal or adjective of a single sentence. This is shown in (157) below where the VP node in (157a) bears the same relation to the two circled nodes of that configuration as the node $S_2$ of (157b) bears to the two circled VP nodes of that configuration; (157c) shows that such a relation does not hold in disjunction:

\[(157)\]
\[
\begin{align*}
(157) & \quad a) \quad S \\
& \quad \quad NP \quad VP \\
& \quad \quad \quad V \\
& \quad \quad \quad \quad \quad \text{be} \quad \text{to} \\
& \quad \quad \quad NP \quad \{\text{ADJ}\} \\
& \quad b) \quad S_1 \\
& \quad \quad NP \quad VP \\
& \quad \quad S_2 \\
& \quad \quad \quad \text{and} \quad NP \quad VP \\
& c) \quad \Sigma \\
& \quad S \\
& \quad \quad NP \quad VP \\
& \quad \quad or \\
& \quad \quad S \\
& \quad \quad \quad NP \quad VP
\end{align*}
\]

There is one more point which supports the analysis of different deep structure sources for conjunction and disjunction, and particularly the analysis of conjunction as a subordinate structure. This has to do with an example mentioned by Jim McCawley (1970), which is quoted in (158) below:

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Margaret is believed by many to be pregnant, but she denies it.

He points out that this example necessitates our positing that sentence pronominalization (but no other type of pronominalization) is a pre-cyclic rule and furthermore that this is the only known pre-cyclic rule. Although he does not explain this, the reasoning is presumably as follows. The base sentence for the first of the two conjoined sentences is Many believe that Margaret is pregnant; the subject of the sentential complement is raised to object position in the Matrix VP and the VP of the sentential complement is made into an infinitive giving rise to Many believe Margaret to be pregnant. Then in the next cycle PASSIVE applies to the Matrix S and transforms it to Margaret is believed by many to be pregnant. The second of the two conjoined sentences is derived from the following base sentence: Margaret denies that Margaret is pregnant. Both the subject and the entire sentential complement undergo pronominalization bringing about: She denies it.

The problem arises in that the pronoun 'it' in the second sentence takes the entire deep structure sentential complement of the first sentence (i.e. Margaret is pregnant) as its antecedent; obviously this pronominalization must be accomplished before the antecedent sentential complement is mutilated by SUBJECT-RAISING and PASSIVE, since otherwise the identity conditions for pronominalization cannot be met. But pronominalization is a cyclic rule which is ordered after
PASSIVE (cf. Ross, 1969). If we consider conjunction to be a coordinate structure, then both sentences of the conjoined pair in (159) will be in the same cycle, the passive will apply before pronominalization, and the conditions of identity for the pronominalization of the sentential complement in the second sentence to 'it' will not be met. Therefore it is necessary to make sentence pronominalization a pre-cyclic rule.

But if conjunction is a subordinate structure, we need not postulate any special status for sentence pronominalization because the sentential complement of the second sentence will be in a lower cycle than that of the first sentence, and therefore it will be pronominalized before SUBJECT RAISING applies to the sentential complement of the first sentence and before PASSIVE applies to the matrix. This is illustrated in (159) below where the numbers on the S nodes indicate the cycles from the first (1) to the last (6).

(159) S

\[ \text{S}_{11} \]  
\[ \text{S}_{12} \]
\[ \text{PASSIVE} \quad \text{NP} \quad \text{VP} \quad \text{but} \]
\[ \text{many} \quad \text{believe} \quad \text{S}_2 \]
\[ \text{Margaret is pregnant} \]
\[ \text{S}_{13} \]
\[ \text{NP} \quad \text{VP} \]
\[ \text{Margaret} \quad \text{denies} \quad \text{S}_1 \]
\[ \text{she} \]
\[ \text{Margaret is pregnant} \]
\[ \text{S}_{14} \]
\[ \text{it} \]

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As a final argument against the traditional view of conjunction and disjunction, it can be said that the new analysis is superior to the old in that it achieves configurationally what the prevailing analysis achieves by means of labelling. Therefore the new view achieves explanatory adequacy. Conjunction and disjunction need no longer be labelled in deep structure, since such labelling of function is redundant and unnecessary, just as it is for functions such as 'subject' and 'object'. (Admittedly, this last point will not hold much sway with case grammarians, who reject this type of argument.)
7.8 Footnotes

1. Note that because of this identical and non-identical subject distinction in conjunction, Mooré allows the subject of the second of two conjoined sentences to be pronominalized with the object of the preceding sentence as its antecedent, and no ambiguity arises. This type of pronominalization is not usual in English (i.e. that in (b) below), where an ambiguity arises, although the ambiguity might be resolved by stressing the he of the (b) sentence.

   a) aKulg\(_i\) p\(\text{\textsuperscript{\scriptsize t\text{\textsc{u}}sa}}\) aTene \(\text{\textsuperscript{\scriptsize la \text{\textsc{x}}} kuli.}\)
      
      Kulga/greeted/Tene/and/he/left
      
      'Kulga\(_i\) greeted Tene and he\(_i\) left.'

   b) aKulg p\(\text{\textsuperscript{\scriptsize t\text{\textsc{u}}sa}}\) aTene\(_i\) t'a\(_i\) kuli.
      
      'Kulga greeted Tene\(_i\) and he\(_i\) left.'

2. There is a similar phenomenon of scope which separates dependent and independent conjunction in English. The 'additional' adverbs too and also and their negative reflex either when occurring in independent sentence conjunction take as their scope of modification only the sentence which immediately precedes. In (a) and (b) below each of the sentences in the conjoined pair has a primary stress (as marked by acute accent) and the scope of too in (a) and that of either in (b) is limited to the sentence which immediately precedes it; (a) and (b) are equivalent to the independently conjoined Moore sentences in (78a) and (84) respectively.

   a) John\(_i\) went home, and he\(_i\) went to bed too.

   b) John\(_i\) didn't go home, and he\(_i\) didn't go to bed either.

   When too or either appears with a dependently conjoined string, however, it always includes the entire series in its scope of modification. Thus in both (b) and (c) below there is only one primary stress for the whole series and there is an understood preceding sentence stating that John didn't do something else in addition to going/not going home and going to bed.

   c) John went home and went to bed too.

   d) John didn't go home and go to bed either.

   When the independently conjoined pairs in (a) and (b) are reduced to VP conjunction, there is a slight pause between the VPs (marked by a comma) and the primary stress in both parts of the conjoint remains, as (e) and (f) show; the scope of too/either remains the same as in (a) and (b).
Also the negative in the second sentence of the conjoint pair in (f) cannot be reduced as the unacceptability of (g) indicates:

   e) John went home, and went to bed too.
      *John went home and went to bed too.

   f) John didn't go home, and didn't go to bed either.
      *John didn't go home and go to bed either.

   g) *John didn't go home, and go to bed either.

Thus (c) and (d) are not reductions of (a) and (b) respectively, but the acceptable sentences of (e) and (f) are.

While in Mooré dependent conjunction optionally reduces to VP conjunction, in English (at least in my speech) such reduction is obligatory, which explains the fact that there is no direct translation equivalent in English for the Mooré examples in (72a) and the unreduced sentences of (80), i.e. VP conjunction must be used. On the other hand, English permits optional reduction of independent conjunction, e.g. (e) and (f) above, while Mooré does not, e.g. (79).

3. Of course if the abstract performatives are verbs of command, then me will not appear. Independent conjunction may occur between imperatives as well, e.g. note that the use of la contrasts with n in imperatives where the 2nd person subject has been reduced, as (a) and (b) show:

   a) yū berā n rik timā (dependent)
      drink/porridge+the/and/take/medicine+the
      'Drink the porridge and (then) take the medicine.'

   b) yū berā la rik timā (independent)
      'Drink the porridge, and take the medicine.'

(a) is a reduction of (c) below, and (b) is a reduction of (d).

   c) t'f yū berā la f rik timā.
      that/you/drink/porridge+the/and/you/take/medicine+the
      'Drink the porridge and (then) take the medicine.'

   d) t'f yū berā la t'f rik timā.
      'Drink the porridge, and take the medicine.'
4. As mentioned in note 3, section 6.4, there is a particle bi which substitutes for ti in imperatives, and thus (94) could have the sense: 'Kulga has gone home, Tene should go to bed!' There is no evidence that this sense has any connection with disjunction, and so I have marked (94) as unacceptable as a disjoint sentence.

5. It might seem on the surface that English violates this last point, since we get sentences like (a) below where the negation extends into the second VP.

a) He hasn't gone home, or gone to bed.

Actually, (a) is just another gloss for the Moore sentence in (84b) of section 7.1, whose English gloss is repeated in (b) below:

b) He hasn't gone home and he hasn't gone to bed.

(a) can be analyzed as a reduction of (b) where or is substituted for and when the identical subject and the negative of the second of two conjoined sentences are deleted (cf. (g) of note 2).

It is interesting to note that De Morgan's Law in symbolic logic captures this English equivalence:
\[ \neg p \neg q \equiv \neg (p \vee q) \], where (b) is equivalent to the left side of the equation and (a) to the right side. The fact that there is no direct Moore equivalent for either (a) above or the right side of the above equation leads one to speculate that had DeMorgan been a speaker of a language like Moore, he might not have come up with his law. Thus with respect to natural language, DeMorgan's law is not universal, but reflects a language specific (i.e. English) transformational relation between sentences like (b) and (a). (It's not quite as simple as this, since I think the nature of or at the level of deep structure--that is, is it inclusive or exclusive or are there two separate or's?--is also involved. It is my feeling that there is only one deep structure or and that it is exclusive, but there is not space here to pursue this further.)

6. Actually ne is quite a ubiquitous particle in that it turns up in many constructions, e.g. at the head of concessive clauses where it is followed by a factive nominalization and has the sense of 'in spite of/although', as a sort of all purpose preposition after certain verbs where it may translate as 'to' or 'for', at the head of manner adverbials where it is followed by an action nominal and has the sense of 'by', at the head of various formulaic salutations. I shall deal only with its conjunctive sense in this work.

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7. There are a number of interesting facts about relative clauses which cannot be explored in detail for lack of space; however, I would like to mention the following in passing. It is interesting that *ninga/nisi* is the [+SPECIFIC, -DEFINIT] determiner which normally has the meaning 'a certain' (cf. note 15 in section 5.11). The definite determiner *wâ* may appear in the place of *ninga/nisi* after the antecedent noun of a relative clause with no change in meaning, e.g. compare (a) below (where the definite determiner contracts and merges with *dawa*, cf. section 3.17) with (127b):

a) dawa*b* fo sê ya*a* sob zaamê wâ kula me.

*man*+the/you/*sê*/saw/him*/soba/yesterday/*wâ*/went home/*me*

'The man who you saw yesterday went home.'

When the antecedent is followed by the determiner *ninga/nisi* (but not when it is followed by *wâ*) there is an optional variant: the antecedent may appear inside the relative clause in the normal position of the identical noun in the relative clause, e.g. (b) is an optional variant of (127b):

b) fo sê ya daw ninga zaamê wâ kula me.

*you/*sê*/saw/man/ninga/yesterday/*wâ*/went home/*me*

'The man who you saw yesterday went home.'

This provides important evidence in favor of the analysis of relativization proposed in Stockwell, Schachter, and Partee (1968), which I have adopted in this work. They put forward a number of arguments to show that identity between a noun in a relative clause and its antecedent does not involve the entire NP, but only the node NOM; they propose that the determiner for the noun in the relative clause is always [+SPECIFIC, -DEF]. Thus the structure for both (127b) and (b) above before relativization would be that in (c) below:

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Given the structure in (c), Moore permits the following options: 1) deletion of the antecedent NOM₁ of S₁, in which case (b) above results; 2) movement of the determiner ninge of S₂ to the right of the antecedent NOM₁ of S₁, insertion of a pronoun for NOM₁ of S₂ (and movement of the pronoun to the Vb of S₂—cf. note 8 below), and insertion of soba in the place of NOM₁, in which case (127b) results; 3) an optional replacement of ninge following the antecedent noun by wā, in which case (a) above results. Thus the positing of a [+SPECIFIC,-DEF] determiner for the identical noun in a relative clause enables us to explain all these variations.

André Wilson (1963) has discovered a similar phenomenon in Dagbani, a language which is fairly closely related to Moore.

8. The pronoun is inserted in the verbal group while soba occupies the position of the NP object and therefore triggers the insertion of the complement marker la by CM INSERT (cf. (55) in section 5.10). This elides in the surface according to the principles outlined in section 3.30 of Part I. The structure for the VP of a relative clause containing soba is:

\[
\begin{align*}
\text{VP} & \quad \text{Vb} \\
\text{Pro} & \quad \text{Pro} \\
\text{Vb} & \quad \text{NP} \\
\text{NP} & \quad \text{VP}
\end{align*}
\]

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9. Paul Schachter (private communication) has pointed out that the same phenomenon of sentence pronominalization occurs in sentences with concessive clauses, as shown in (a) below:

a) Although Margaret is believed by many to be pregnant, she denies it.

In the surface, the although clause is subordinate to the main clause she denies it and thus would seem to be a counter-example to the argument proposed for (158). However, Rutherford (1970) argues quite convincingly that although clauses originate in deep structure as an adverbial on a hyper-sentence. Thus in deep structure the adverbial clause in (a) above would be a part of the declarative hyper-sentence that dominates the surface main clause and would undergo pronominalization before mutilation of its antecedent.

But in the same analysis Rutherford contrasts although clauses ('non-restrictive' concessives) with even though clauses ('restrictive' concessives) in claiming that the latter is restrictive of the surface main clause. He therefore proposes that in deep structure even though clauses restrict the complement of the hyper-sentence. An example of such a sentence is given in (b).

b) Even though Margaret is believed by many to be pregnant, she denies it.

It is not by any means clear what the actual form for concessive clauses is in deep structure. (For example, are they just an S under a node ADV or do they perhaps originate as the subject of an abstract verb QUALIFY in a structure which is similar to that for reason adverbials?—cf. section 9.1.) If it turns out that concessives of the type in (b) above are subordinate in deep structure to the clause that they modify in the surface, then (b) above would undercut the argument built around (158) in the text. I rather suspect that this is not the case and that in deep structure the surface adverbial clause is dominant.
8.0 Constructions Related to Conjunction

8.1 Sentential Time Adverbs

It is probably a language universal that sentences containing sentential time adverbs expressing the relations of 'after', 'when', 'while' can be paraphrased by a sentence containing a dependently conjoined series. (Such adverbial clauses expressing 'before' are also paraphrasable by a dependently conjoined series, but since these frequently contain an underlying negative, they will be discussed separately further on.) In the case of a dependent series which paraphrases a sentence with an 'after' or a 'when' clause, the adverb then can always be inserted in the second clause. When the time adverbial appears in initial position, then may appear in the main clause. This is shown in (160) below where the (a) and (b) sentences have essentially the same meaning.

(160) a) \{when \after \} John arrived, (then) Mary left.

b) John arrived and (then) Mary left.

In the case of a dependent series which paraphrases a sentence with a 'while' clause, the two verbs are simultaneous actions, and therefore then may not appear in the second sentence; similarly the adverb then may not appear in the main clause of a sentence with a sentential time adverb.
expressing the relation 'while'. This can be seen in (a) and (b) of (161), which are paraphrases.

(161) a) Pompidou was singing and (*then) Nixon was doing the Frug.

b) While Pompidou was singing, (*then) Nixon was doing the Frug.

Another point of similarity is that the same tense restrictions which hold between an adverbial time clause and the main clause it modifies also hold for the corresponding dependently conjoined series, i.e. both verbs must be in the same tense. This is indicated by the unacceptability of the sentences in (162) where (a) is paired with (b) (past plus present-future) and (c) with (d) (past plus present).

(162) a) *John arrived and (then) Bill will leave.

b) *(After When) John arrived, (then) Bill will leave.

c) *John arrived and (then) Bill {leaves.

{is leaving.}

d) *(After When) John arrived, (then) Bill {leaves.

{is leaving.}

In Moore's, sentential time adverbials take the form of relative clauses with the time noun wakato 'time, moment' as the relativized noun. There are at least three surface variations for time relatives: a) the identical time noun in the relative clause may be deleted (cf. (163a)), b) the antecedent time noun may be deleted (cf. (163b)), c) both the time noun in the relative and the antecedent time noun may be deleted (cf. (163c)). Notice that the difference between time relatives and regular relative clauses is that in the
latter the identical noun may be pronominalized, while in the former no such pronominalization occurs. (For an explanation of the process of relativization in Moore, see (128) in section 7.6 and note 7 in section 7.8.) The dependent series which corresponds to (163a,b,c) is given in (163d).

(163)

\[
\begin{align*}
\text{(a)} & \quad \text{wakat Ninga akulg sê ta wâ} \\
& \quad \text{time/ninga/Kulga/sê/arrived/wâ/}
\end{align*}
\]

\[
\begin{align*}
\text{(b)} & \quad \text{akulg sê ta wakat ningâ} \\
& \quad \text{Kulga/sê/arrived/time/ninga+wâ/}
\end{align*}
\]

\[
\begin{align*}
\text{(c)} & \quad \text{akulg sê ta wâ} \\
& \quad \text{Kulga/sê/arrived/wâ}
\end{align*}
\]

'Then Kulga arrived, (then) Tene went home.'

\[
\begin{align*}
\text{(d)} & \quad \text{akulg taa me t'aTene (yaol n) kuli.} \\
& \quad \text{Kulga/arrived/me/and/Tene/(then/to)/go home}
\end{align*}
\]

'Then Kulga arrived and (then) Tene went home.'

In the following discussion, I shall use the form in (163c) for time relatives. (Even though this form is identical to a factive nominalization—cf. (d) in note 10 section 5.11, there is no confusion between the two, since they never occur in the same surface slot.)

As for the time relations signaled by the English words while, when, and after, only after has a direct translation in Moore; it is rendered by the post-position poore 'behind;

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after' (literally 'back') plus the locative suffix -₃ 'at'; the postposition is placed after the time relative, as in (164):

(164) aKulg sē ta wā poore, aTene (yaol n) kula me.
Kulga/sē/arrived/wā/after/Tene/(then/to)/went home/me

'After Kulga (had) arrived, (then) Tene went home.'

The relation of continuous simultaneity expressed by 'while' in English is rendered in Moore by putting the verb of the time relative in the imperfective aspect, as shown in (165) where (a) and (c) are paired with the dependent series in (b) and (d) respectively. (For comments on the use of ₋₃ as a past tense marker, see Part I, section 3.4 note 47; kuisi in (c) and (d) is the irregular imperfective of kuli 'to go home'.)

(165) a) aKulg sē yindiŋe wā, aTene saoodē la me.
Kulga/sē/was singing/wā/Tene/was dancing/la/me

'While Kulga was singing, Tene was dancing.'

b) aKulg yindiŋe la me t'āTene saoodē.
Kulga/was singing/la/me/and/Tene/was dancing

'Kulga was singing and Tene was dancing.'

c) m sē kuisiŋe wā, waaf dum m la me.
I/sē/was going home/wā/a snake/bit/me/la/me

'As While I was going home, a snake bit me.'

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d) m kuise̱ la me tì waaf dum ma.

I was going home/la/me/and/a snake/bite/me
'I was going home {and} a snake bit me.'

{when}

(A time relative whose verb is non-imperfective and which is not followed by the post-position poore 'after' expresses the English relation 'when'.)

Before attempting to formally relate sentential time adverbials and dependent conjunction, I want to present an additional datum which will be of help in the formulation of an analysis. There is a transformation which applies to two sentences with non-identical subjects (i.e. where the conjunctive particle is tì) in a dependent series which reverses the order of the sentences. In (166) below the (b) sentence is a transformation of the (a) sentence.

(166) a) aKulg looga me t'aTene ta.

Kulga/left/me/and/Tene/arrive

'Kulga left and (then) Tene arrived.'

b) aTene taa me t'aKulg looga me.

Tene/arrived/me/and/Kulga/left/me

'Tene arrived {and} Kulga had left.'

{when}

In the (b) sentence both parts of the conjunct contain the particle me and both verbs are marked for perfective according to the principles laid down in section 3.32. Therefore the transform which converts (166a) to (166b) not only reverses the linear order of the clauses but also raises the
second clause from its subordinate status and makes it truly
conjoint with the first; thus P-DEL (51) will be blocked and
ME INSERT (48) will apply to both SS, as occurs in disjunc-
tion. It is important to note that the two clauses in
(166b) are not interpreted as being independent of each
other; this fact is captured in the English translation by
the use of the pluperfect in the second clause.

There is also a type of sentence containing a senten-
tial time adverb which is derived from a reversed dependent
series like that in (166b). This is shown (167). Note the
\text{\textipa{\text{tǐ}}} at the head of the main clause and the corresponding use
of the pluperfect in the English translation.

(167) aTene sê ta wā, t'akulg looga me.

Tene/sê/arrived/wā/and/Kulga/left/me

\{'When
\text{\textipa{\text{By the time}}} Tene arrived, Kulga had left.'

I shall propose that a dependently conjoined series such
as that in (166a) is the source not only for reversed de-
pendent conjunction, e.g. as in (166b), but also for sen-
tences with sentential time adverbs, e.g. as in (163), and
(167). Moreover I shall suggest that reversed dependent con-
junction is an intermediate stage in the derivation of time
relative clauses.

First I shall formulate the transformation which re-
verses dependent conjunction; this is presented in (168).
(For the moment ignore \textipa{\text{la}} under c of the SD and condition
2; these will be explained later on.) This rule
reverses the order of two dependently conjoined sentences
(S₁ and S₂ in the trees below) and attaches them as sisters
under a newly added S node (S₀ in the tree on the right
below).

(168) DEP-CONJ-REVERSE (optional)

\[
\begin{array}{c}
SD: X \left[ \left[ X \left[ \frac{\text{ti}}{NP} \right] \right] X \right] X \Rightarrow \\
1 & 2 & 3 & 4 & 5 & 6 & 7 \\
S & NP & S & \frac{la}{NP} & S & \frac{ti}{NP} & X
\end{array}
\]

SC: 1, [+4+6+2+5+3+], Ø, Ø, Ø, 7,

\begin{align*}
\text{Conditions: 1) } & a \supset b \text{ (i.e. } a \text{ 'directly dominates } b \text{ and therefore } b \text{ is not } \\
& \text{ a sentential verb complement.)} \\
\text{2) if } c = \frac{la}{NP}, & a \succ \text{wakat } \tilde{w}a \text{ and } \\
& b \succ \text{wakat } \text{ninga}
\end{align*}

Before giving the transformations for time relatives,
let me introduce an addition to the phrase structure expen-
sion of VP as presented in previous sections. In (169a) be-
low the optional node TIME for time adverbials has been
added.

(169) a) PS2''' VP \rightarrow VB (NP) (TIME) \left( \frac{\{2\}}{S} \right)

b) PS 6) TIME \rightarrow NP (poorê)

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TIME expands into NP plus optional postposition poor 'after', as shown in (169b). It is assumed that only time nouns like wakato 'time, moment' and zaamē 'yesterday' etc. are inserted under the NOM of an NP dominated by TIME. This restriction on time nouns can be handled by a strict-subcategorization feature, which will not be stated here.

The deep structure for sentences with sentential time adverbials such as those in (163), (164), (165), (167) is a dependently conjoined series where both sentences contain the node TIME dominating an identical time noun wakato 'time' and where in the first sentence the time noun is followed by the [+SPECIFIC,-DEF] determiner ninja 'a certain' and in the second it is followed by the [+SPECIFIC,+DEF] determiner wā 'the, that', e.g. 'Kulga arrived at a certain time (wakat ninja) and Tene left at/after that time (wakatē).' (Actually the second determiner wā is probably introduced transformationally and is a surface indication of the identity of the two instances of wakato 'time'.) When such a sentence has gone through DEP-CONJ-REVERSE (168) it will meet the SD of TIME-REL-1 below; this rule attaches the right member of the conjoint pair (S₁ in the tree below) as right sister to the NOM of the NP under TIME in the left member of the conjoint pair of sentences (S₂ in the tree below); Ș INSERT, (129) of section 7.6, and certain other transforms not mentioned in this work then operate on the embedded sentence (S₁ below) to create a surface relative clause.
(171) TIME-REL-1

\[
\begin{array}{cccccc}
 & 1 & 2 & 3 & 4 & 5 & 6 \\
SD: & X [ \text{wakato} ] [\tilde{\text{wá}}] X ] & \{ \text{NP} \} [ \text{NP} ] [ \{ \text{NOM} \} \text{la} ] \\
& 5 & 3+5+2, & \varnothing, & \varnothing, & \varnothing, & \varnothing, 6 \\
SC: & \text{Condition: if } \text{a} = \text{tì}, \text{TIME-REL-1 is optional} \\
\end{array}
\]

The condition on TIME-REL-1 and condition 2 on DEP-CONJ-REVERSE (168) relate to the fact that though there are sentences with a sentential time adverb whose subject is identical to the subject of the main clause, as in (171b) below, and there are dependently conjoined series which paraphrase them, as in (171a), there is no surface reversed dependent conjunction with identical subjects, i.e. connected

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by la, nor is there any sentence like (171c) which corresponds to (167) above.

(171) a) aKulg kēe doogē{\text{n}\text{ la a}} zindi.

Kulga/entered/house+ē/and/(he)/sit down

'Kulga entered the house and sat down.'

b) aKulg_{i} sē kē doogē wā poorē, a_{i} zinda me.

Kulga/sē/entered/house+in/wā/after/he/sat down/me

'After Kulga_{i} (had) entered the house, he_{i} sat down.'

c)*aKulg_{i} sē zinda, la a_{i} kēe doogē.

Therefore any sentence conjoined by la which undergoes DEP-CONJ-REVERSE must obligatorily undergo TIME-REL-1; this is not true of sentences connected by ti.

There is a late rule, not formally stated in this work, which optionally moves TIME from VP to the front of the sentence (ADVERB FRONTING); in all of the examples above, this rule has been applied. If ADVERB FRONTING is not applied, a sentence like that in (172) below results:

(172) aTene kula aKulg sē ta wā (poorē).

Tene/went home/Kulga/sē/arrived/wā/(after)

'Tene went home \{when\ (after) \} Kulga arrived.'

(Compare (172) above with (163c) and (164); note the elision of the post-verbal particle me after kula in (172) according to the principles outlined in section 3.29.)

We must add one further transform in order to produce sentences like (167). I shall assume that for sentences
which do not undergo TIME-REL-1 there is a readjustment of the determiners of the TIME NPs in the conjoint pair which has undergone DEP-CONJ-REVERSE where the order of the determiners is reversed; this gives a reading like the following: 'Tene arrived at a certain time (wakat ninga) and Kulga had left at that time (wakatâ).' TIME-REL-2 then performs a mirror image of TIME-REL-1 by attaching the left member of a reversed dependent conjunction (S₂ in the tree below) as right sister of NOM under the TIME NP of the right member (S₁ in the tree below). The conjunctive particle tî is not deleted, as in TIME-REL-1. (The set of English transforms which corresponds to TIME-REL-2 inserts an obligatory pluperfective in the surface main clause—cf. the English gloss for (167).)

(173) TIME-REL-2

SD: X [ X [ wakato ] [ninga] X ]
    _S_ NOM NOM D D S_
    1 2

[ [ tî X [ wakato ] [wâ] X ] X ]

S NP NOM NOM D D S

3 4

SC: 1, ø, 3+2+4
Of course (167) also has ADVERB FRONTING in its transformational history.

Finally, I should mention how sentential time adverbs expressing the relation 'before' are formed. This is done by generating a dependently conjoined pair where the second sentence (i.e. the subordinate S) contains an indefinite negative (ka~pa...ye) plus the adverb mānnando 'yet', as shown in (174) below. (Mānnando usually appears in the surface in preverbal position as nan; it is this form which I shall use. For examples of this adverb cf. note 9 examples (c) and (d) in section 5.11.)

(174) akulgu kulma t'atene nan ka ta ye.

Kulga/went home/me/and/Tene/yet/not/arrive/ye

'Kulga went home before Tene arrived.'
(174) can then be transformed via DEP-CONJ-REVERSE and either TIME-REL-1 or TIME-REL-2 (plus ADVERB FRONTING) to (175a) or (175b) respectively.

(175) a) akulg së kulā, aTene nan ka ta ye.

Kulga/se/went home+wâ/, Tene/yet/not/arrive/ ye

'When Kulga went home, Tene hadn't yet arrived.'

b) aTene së nan ka ta wâ, t'akulg kula me.

Tene/se/yet/not/arrive/wâ/and/Kulga/went home/me

'Before Tene arrived, Kulga went home.'

I should mention that just in this type of dependent series, where the second sentence contains an indefinite negative plus nan (nando), the formal distinction between identical and non-identical subjects as marked by là and tì respectively does not hold, and tì is used to conjoin both types. (176) below shows an example of tì used with identical subjects. Often times such clauses are translated in English by 'without'. (This special instance of tì joining two sentences with identical subjects is handled by condition 3 on the final version of EQUI-NP-DEL in section 10.)

(176) a pagi kji me t'a nan ka paam biig ye.

his/wife/died/me/and/she/yet/not/have/a child/ ye

'His wife died \{before she had any children.\} \{without having any children.\}

By positing an underlying negative in English 'before' and 'without' clauses, we can account for the use of any, as
occurs in the translation of (176), since any is a reflex of the indefinite some after negatives in English. The negative is always deleted after before and without in English.

Before closing this section, I should make some mention of performatives and sentential time adverbials. I have no evidence from Moore to indicate that the above transformations apply to conjoined performatives, though I haven't investigated this area in detail. However, there is interesting evidence from English which indicates that a sentential time adverbial transformation applies to conjoined performatives. This is demonstrated by the fact that the adverbial connector while may be optionally substituted for contrastive and/but as (177a) shows; note the paraphrase in (177b). The while clause, like other adverbial clauses may undergo fronting, which accounts for sentences like (177c).

(177) a) Harry is stupid, \(\{\text{and} \quad \text{but} \quad \text{while}\}\) Alphonse is quite intelligent.

b) I claim that Harry is stupid, \(\{\text{and} \quad \text{but} \quad \text{while}\}\) (at the same time) I claim that Alphonse is quite intelligent.

c) \(\{\text{While} \quad \text{But} \quad \text{And}\}\) Alphonse is quite intelligent, Harry is stupid.

We can explain the fact that only while and never after or before clauses may occur as a sentential time adverb for performatives by pointing out that performatives are always in the immediate (i.e. non-future and non-habitual) present
tense and while is the only adverbial connector that may link such present actions, after and before being used to link only non-immediate present actions, as the sentences in (178) show.

\[(178) \text{a) } \#\text{I claim that Harry is stupid } \{\text{before}\} \text{ I claim that Alphonse is quite intelligent.}\]

b) *Harry is singing \{after\} Bill is dancing.

c) Harry is singing while Bill is dancing.

8.2 Case Relations: Indirect Object, Instrumental, Locative, and Benefactive

Like so many other West African languages, Mooré often expresses basic case relations with a series of verbs where each verb has an object. In other words, in place of case markers such as the inflectional endings and prepositions of Indo-European, Mooré uses verbs as case markers. Perhaps it is more accurate to describe these constructions as series of VPs. The VPs are connected by the particle n, which is the marker both for infinitival complements and VP conjunction; these series exhibit all the same structural characteristics of VP complementation and conjunction, e.g. unmarked perfective in non-initial verbs etc., as discussed in previous sections.

Verbs which take 'indirect objects', for example, take the semantic 'indirect object' as their syntactic direct object and are preceded in a series either by the verb talle 'to possess/to have in one's possession/to take possession of'
or the verb dika 'to take/to pick up' with the semantic 'direct object' as its syntactic object. (Indirect object verbs include the following: kō 'give', winegi 'show', toole 'to send', lobge 'to throw' etc.) This type of construction is illustrated in (179a); an alternative form is shown in (179b) where the first verb is absent and its object appears after the object of the second verb, which functions as the surface main verb. For Mooré speakers, (179a) and (179b) are paraphrases.

(179) a) a \{dika\} ligdã₁ n kō (a₁) aKulga.

he/took/the money/and/give/(it)/Kulga

'He took the money and gave it to Kulga.'

b) a kōo aKulg ligdã.

he/gave/Kulga/the money

'He gave Kulga the money.'

Clearly our grammar must relate these two sentence types; the obvious candidate for the more basic type is (179a), since if we were to derive (179a) from (179b) it would demand a good deal of complicated structure building by transformation (i.e. it is always easier--and therefore preferable--to derive a single sentence from a multiple of sentences rather than a multiple of sentences from a single sentence). But, before proposing an analysis, we must determine the nature of the relationship between the VPs in (179a): is it dependent conjunction or sentential verb complementation? Previous generative analyses of this
construction have claimed the latter (cf. Williamson (1965) and Stahlke (1970)); on the basis of the evidence found in Mooré, I shall claim the former. That dependent conjunction is the source for sentences like (179a) is supported by the fact that there is an additional paraphrase where the identical subject of the second sentence has not been reduced, as shown in (180).

(180) a) a [díka] [talla] ligdâ:i la a kōa i a Kulga.

he/took/the money/and/he/give/it/Kulga

'He took the money and he gave it to Kulga.'

(The object pronoun in the second VP of (179a) is optional because Mooré permits either pronominalization or deletion of the second of two identical definite NP complements in VP conjunction—the deletion can be analyzed as a limited type of gapping; the reason that the pronoun is in the position between the verb and the indirect object is that there is a rule which moves short form pronouns (i.e. non-emphatic) into the verbal group (Vb) in a similar fashion to French—cf. section 3.23 and section 3.26.)

From the point of view of universal grammar, an argument against analyzing such sentences as (179a) as coming from sentential verb complement constructions is that this necessitates analyzing 'take/possess' verbs (i.e. talle and dike in Mooré) as belonging to one of the classes of verbs which take sentential complements in deep structure. As indicated in section 5.7, these classes are probably universal, yet
'take/possess' verbs do not fit any of these categories semantically. Moreover I know of no other language group where the equivalent verbs may take sentential complements (e.g. take in English, prendre in French, etc.).

Given the above data, I shall propose the following analysis for indirect objects. Verbs which take indirect objects, such as kō 'give', are generated in deep structure with only one NP complement, i.e. the surface indirect object; furthermore, they must appear in a dependent series preceded by a sentence which contains a 'take/possess' verb, i.e. dike or tallé. (This latter restriction is handled by a rule feature such as Lakoff has proposed—cf. G. Lakoff (1970)—where such verbs as kō 'give' are marked as obligatorily meeting the SD of D(irect) O(bject) COPY in (181) below; I shall represent this informally as [+IO].) The rule in (181) copies the NP object of the preceding 'take/possess' verb (represented as [+TAKE]) in the position following the NP object of the indirect object verb.

(181) D.O. COPY

\[
SD: \begin{array}{c}
X & \overset{a}{\text{NP}} & [V \overset{b}{\text{NP}}] \\
& & [V \overset{c}{\text{NP}}] \\
& & [V \overset{d}{\text{NP}}]
\end{array}
\]

\[
1 \hspace{1cm} 2 \hspace{1cm} 3
\]

\[
X \implies \overset{4}{\text{NP}}
\]

SC: 1, 2, 3+2, 4

Condition: \( a = b \)
Following D.O. COPY, there is an optional rule (given in (182) below) which deletes the sentence immediately preceding a [+IO] verb in a dependent series; this produces sentences like that in (179b).

(182) D.O. REDuction (optional)

\[ \text{SD: } X \{ X \} \{ X \} \{ +V \} \{ +IO \} \{ X \} \]

\[ \text{SC: } 1, \emptyset, 3 \]

Instrumental constructions show a paraphrase pattern similar to that of indirect object constructions; however, in the reduced form the instrumental NP takes the prepositional particle ne 'with'. Thus the sentences of (183) are
paraphrases, like those in (179) and (180).

(183) a) a \{dīka \{talla\} sụgā \{n \{la \{a\} \} wāg nemdā.  
he/took/the knife/and/(he)/cut/the meat

'He took the knife and cut the meat (with it).'

b) a wāga nemdā ne sụgā.
he/cut/the meat/with/the knife

'He cut the meat with the knife.'

Taking (183a) as the basic sentence type, I shall claim that there is an optional rule called INSTRUMENT COPY. This rule is very similar to D.O. COPY above in that it copies the object of a [+TAKE] verb after the object of an action verb (e.g. wāge 'cut' in the case of (183)) which follows in a dependent series; in addition it adds ne in front of the copied NP. Then a rule which is similar to, or perhaps merely an expanded version of, D.O. RED above deletes the first sentence of the series leaving a sentence of the type in (183b). Since these two rules are very similar to those presented in (181) and (182), I will not take the space to present them formally in this work.

It should be pointed out that there is a problem in this solution for instrumentals: the derivation of instrumental subjects. Barbara Hall Partee (Hall, 1965) has pointed out that certain transitive verbs, such as break, may also appear as intransitive verbs and that when they are intransitive they take as subjects the same class of nouns that occur as objects to the transitive form. This is illustrated for both Mooré and English in (184) below:

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(184) a) aKulg wāga rʊkā.
   Kulga/broke/the pot
   'Kulga broke the pot.'

b) rʊkā wāga me.
   the pot/broke/me
   'The pot broke.'

Her proposal for accounting for this relationship involves postulating that this type of verb may be generated without a subject (i.e. by modifying the expansion of S: S \( \rightarrow (NP) \) VP) and that in such a subjectless sentence the object is obligatorily moved to subject position by transformation. This solution would work for Mooré.

However, in conjunction with the above observation Partee goes on to point out that this same class of verbs when functioning transitively and in the absence of a human subject takes as subject the same class of nouns which appear as instrumental adverbs. This is illustrated in (185) below.

(185) a) aKulg wāga rʊkā ne kugrā.
   Kulga/broke/the pot/with/the stone
   'Kulga broke the pot with the stone.'

b) kugrā wāga rukā.
   'The stone broke the pot.'

She proposes that sentences like (185b) are derived from underlying subjectless sentences where an instrumental adverb is generated in VP along with the direct object; the
instrumental is then moved into subject position, by transformation.

But if we accept the analysis of instrumentals as being derived from a dependently conjoined pair of sentences, it is not clear what the deep structure for sentences like (185b) is. Possibly we could generate a dependent series like that in (183a) where both verbs are subjectless in deep structure and then move the object of the 'take' verb down as subject of the following verb, i.e. the surface main verb. But this is counter-intuitive because it requires that we consider a 'take/possess' verb as belonging to the class of verbs which may appear in deep structure without a subject (and thus as intransitive verbs in the surface), yet such verbs are always transitive with human subjects and never intransitive, e.g. 'The stone took'. Alternatively we might generate a dependent series where the 'take' verb has a dummy subject, e.g. 'DUMMY took the stone and broke the pot', and then move the object of 'take' as above. But this implies that semantically there is an agent underlying sentences like (185b), yet sentences with instrumental subjects do not seem to have implied (i.e. 'understood') agents, as, for example, do surface agentless passives (cf. note 2, section 5.11). A third alternative is to consider the first verb to be some normal intransitive similar to that in the following sentence: 'The stone fell and broke the pot'; the subject of the first sentence would then be copied as the subject of the second.
In a more recent treatment of this topic, Fillmore (1968) has proposed that all the basic case relations are generated in deep structure as labelled nodes under VP and that various rules move one or another NP into subject position. Although this view is adequate in accounting for sentences like (184b) and (185b), it fails to relate dependently conjoined pairs like (179a) to surface simple sentences like (179b) (and similarly (183a) to (183b)). Since I can offer no definitive solution at this time, I shall leave the question of instrumental subjects open.

The locative is another case relation which is expressed either as a dependent series or as a simple sentence. A locative NP is marked by the suffix -ẽ 'at/in'. (For further comments on -ẽ, cf. section 3.26 (107) and note 47 in section 3.37.) In copular sentences the locative relation is marked by the verb be 'to be in/at; to exist'; this is distinct from qa 'to be', which is the linker for predicate adjectives and predicate nominals. With the exception of proper place names (e.g. Wagdgu 'Ouagadougou'), any NP which follows be 'to be' automatically takes -ẽ and thus the generation of at least certain occurrences of locative -ẽ is tied to the selection of the locative verb be. The Moore' sentences in (186) below are paraphrases, as are the English translations.

(186) a) a bee zakẽ la a dygda.

she/is/compound+at/and/(she)/is cooking

'She is at the compound cooking.'

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b) a dugda zake.

'she/is cooking/compound+at

'She is cooking at the compound.'

I shall assume that surface simple sentences like (186b) are derived from an underlying dependently conjoined series like that in (186a) where the first sentence contains a locative copula. I shall not give a formal presentation of the rules which derive sentences like (186b); the process is very similar to that described for indirect objects and instrumentals above, i.e. there is a rule called LOC-COPY which copies the locative noun of the first sentence into the VP of the second and this rule is followed by one which then reduces the first sentence.

Benefactive adverbials (i.e. translated as 'for someone' in English) are also construed by a verbal series; the benefactive clause, which is second in the series, contains the verb kō 'to give' as its main verb and the beneficiary as its object. There is no optional reduction to a single surface verb for these constructions as is the case for datives (cf. 179b), instrumentals (cf. 183b), and locatives (cf. 186b). Benefactive constructions are illustrated in (187) below.

(187) a) a tumda me n kō naabā.

'he/is working/me/and/give/chief-the

'He is working for the chief.'
b) a kųu noaag n kō naabā.

he/killed/chicken/and/give/chief-the

'He killed a chicken for the chief.'
9.0 Abstract Verbs and the Derivation of Reason and Purpose Adverbials

9.1 Reason Adverbials and Abstract Syntax

In her book entitled Abstract Syntax and Latin Complementation (1968), R. Lakoff puts forward the hypothesis that reason and purpose adverbials (as well as imperatives) originate in deep structure as complements of certain abstract verbs. She bases her arguments on structural and semantic similarities in Latin between reason adverbials and complements of verbs of declaration and between purpose adverbials and complements of verbs of willing. Moore presents strong evidence in support of Lakoff's analysis.

In the case of reason adverbials in Moore, we see that they are identical to complements of verbs of declaration:

a) they take the complementizer tì at the head of the clause,
b) they take the indicative negative ka~pa...(ye),
c) they take the post-verbal particle me and the main verb is always marked for aspect (cf. section 5.1 and section 5.2). An example of such a reason adverbial is given below in (188):

(188) a) b waa me tì naabā bool b la me.
they/came/me/that/the chief/called/them/la/me
'They came because the chief called them.'

b) m kula me tì bamb pa wa ye.
I/went home/me/that/they/not/come/ye
'I left because they didn't come.'
(For an explanation of the la variant of the complement marker, cf. section 3.26.)

(189) below shows that, as in the case of complements of verbs of declaration, reason adverbials do not undergo EQUI-NP-DEL. (As we shall see in the next section, purpose adverbials, which are derived from the complement of an abstract verb of willing, do undergo EQUI-NP-DEL.)

(189) a) aKulg₁ kula me t'ᵊi bēe me.
   Kulga/left/me/that/he/was ill/me
   'Kulga₁ left because he₁ was ill.'

b) *aKulg kula me n bēe me.

(189b) is unacceptable as a reduction of (189a).

There is an alternative form for reason adverbials where they may take the form of a factive nominalization followed by the post-position noun yĭnga, which literally means 'body' but which is glossed as 'because (of) or 'on account of' as exemplified in (190) below; (190) is a paraphrase of (188a). (For details on the formation of factive nominals, cf. the opening remarks of section 7.6.)

(190) b waa naabā sē bool bā yĭnga.
   they/came/the chief/sē/called/them+(w)ā/because
   'They came because of the chief's having called them.'

(Note that the post-verbal particle me after the main verb waa 'come' has been elided according to the principles established in section 3.29 because the reason adverbial is an NP; such is not the case in (188) and (189) where the...

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reason adverbial has the form of a sentential complement—cf. the opening remarks of section 5.1.)

This alternative form is obligatory when a noun is the only item present in the adverbial, e.g. (191a,b) and when a reason adverbial appears in the focus position of a cleft sentence; e.g. (191c,d); it is also the case that sentential verb complements may not be clefted, e.g. (191e).

(191) a) b waa naaba yînga.
   they/came/the chief/because of
   'They came because of the chief.'

b) *b waa tí naaba.

c) yaa naaba sê bool bû yînga la b waya.
   is/the chief/sê/called/them+(w)â/because of/
   that/they/came(-wâ = perfective, cf. section 3.32)
   'It's because of the chief's having called
   them that they came.'

d) *yaa tí naaba bool b la me la b waya.

e) *yaa tí naaba bool b la me la b yeelya.
   '**It's that the chief called them that they
   said.'

An adequate analysis must provide an explanation for these two structurally divergent surface forms for reason adverbials.

Note that the post-position yînga may be used with a noun phrase to express the idea 'aspect of' 'look/appearance of', as exemplified in (192).
(192) fug yĩngã yaa neere.

garment/the aspect of/is/pretty

'The (aspect/look of the) garment is pretty.'

yĩngã also appears in a similar fashion after a factive nominalization which functions as subject of either the verb signifying 'to mean that...' (which is expressed in Moore by a combination of the verbs date 'to want' and yeele 'to say' with the former acting as matrix and the latter as constituent like vouloir dire in French) or the verb winegi 'to show/indicate that...'. These are illustrated in (193) below. These Moore verbs include the more specialized senses of the English verbs 'to entail', 'to presuppose', 'to result from', as indicated by the glosses in (193).

(193) a) b sẽ wa wã yĩngã dat n yeela me tã naabã bool b la me.

they/se/came/wa/yĩngã/wants/to/say/me/that/
the chief/called/them/la/me

'The fact of their coming means that the chief called them.'
results from the chief's having called them.'

b) a sẽ tar pagb wɔsgã yĩngã {dat n yeela} me t'a yaa arzek soba.

he/se/has/wives/many+(w)ã/yĩngã/winegda/\{wants/to/say\}/
me/that/he/is/wealth/possessor

'The fact of his having many wives means that he is wealthy.'
indicates that he is wealthy.'
entails his being wealthy.'
results from
Both *winegi* and *dat n yeel* belong to the general class of verbs of declaration described in section 5.2, since their complements meet the structural requirements of that class. However, the fact that they may take nominalized sentences as subjects sets them apart from other verbs of declaration (and other sentential complement verbs, for that matter), since all other such verbs always take human subjects; in addition, when they appear in this capacity (i.e. with sentential subjects), they are always heads of two place predicates and therefore form a sub-class of 'mental' verbs of declaration (cf. section 5.2 (10)). (There is another verb *tī* 'to follow/be the consequence of' which belongs to the same meaning class, though it is structurally different in the surface; since I have not thoroughly investigated this verb, I shall not deal with it in this work.)

It is true for all human languages that the sentence contained in a reason adverbial clause is semantically dominant or prior to the sentence of the main clause while in the surface the adverbial clause is syntactically subordinate to the main clause. This is expressed in the English paraphrase relation shown in (194) where the (a) and (b) sentences are paraphrases:

(194) a) X because (of) Y.

b) Y is the cause of/reason for X.

R. Lakoff (1968) has pointed out that the same deep semantic and surface syntactic relations hold between the subject and
complement of 'entail' type verbs as hold between a main clause and a modifying reason adverbial clause. This is illustrated for English in the proportion shown in (195a), which reads as follows: 'X is to Y in "X entails Y" as X is to Y in "X because (of) Y"'; the same proportion is shown for Moore in (195b).

(195) a) \[ X : Y \text{ in } X \text{ entails } Y :: X : Y \text{ in } X \text{ because (of) } Y. \]

b) \[ X : Y \text{ in } X \text{ yînga dat n yeela me ti } Y :: X : Y \text{ in } X \left\{ \begin{array}{c} \text{ti } Y \\ Y \text{ yînga} \end{array} \right\} \]

R. Lakoff's (1968) solution for reason adverbials is as follows: they are derived from the complement of a deep structure abstract non-performative verb which belongs to the class of verbs of declaration and which has the syntactic-semantic properties of an 'entail' type verb. She hypothesizes that this type of verb is subject to a rule known as FLIP which, like the passive, permutes the deep structure subject to surface complement position and the deep structure complement to surface subject position (for the original proposal for FLIP cf. G. Lakoff (1970), p. 126). This rule was first postulated to account for the fact that in English and many other languages there is a very large number of verbs (in fact most) which obligatorily take an animate noun as subject while at the same time there is a small class of verbs which in the surface obligatorily take an animate noun as complement, e.g. (196a,b). The claim is
that in deep structure both types take animate subjects and that FLIP applies to the latter creating the surface restriction of animate complements. This class includes such verbs as interest, amuse, please, frighten, etc.; I shall call it the 'interest' class. Another feature of the 'interest' type in English is that when they undergo the passive transform the surface agent may optionally be marked by a preposition other than by, e.g. in, at, etc., while for non-'interest' type verbs it is obligatorily marked with by, e.g. (196c). (For further comments on this last point, cf. Peterson (1966).)

(196) a) This subject interests John.
    b) *John interests the book.
    c) John is interested in/by that subject.

The same surface restriction of animate complements operates with certain verbs in Mooré under given circumstances. Normally the verb *tare 'to have/hold' must take an animate subject; however, when it is used to express bodily feelings such as 'hunger' (kom), 'thirst' (ko-yuudu), 'fear' (da-beem) and many others, the noun representing the feeling appears as subject and the animate noun which experiences the feeling appears as the object. These points are illustrated in (197) below.

(197) a) mam tara ligdi.
    I/have/money
    'I have some money.'
b) kom tara maam.
   hunger/has/me
   'I am hungry.' (note French: j'ai faim
   I/have/hunger)

c) *mam tara kom.
   I/have/hunger

The verb tare undergoes FLIP when its deep structure object is a noun expressing a bodily feeling or emotion, e.g. (197c) is obligatorily transformed to (197b).

Other cases where FLIP applies are seen in the following expressions: 'to interest', where the verb djiide 'to press' takes as its surface object a possessive construction in which the 'head' (zugu) of the 'interested' being is the possessed NP (e.g. 198a); 'to please', where the verb ta 'to arrive' takes as its object a possessive construction in which the 'mind' (yam) of the 'pleased' being is the possessed NP (e.g. 198b); and with the verb bugsi 'to frighten' where the object is obligatorily animate (e.g. 198c).

(198) a) solmdâ dîita m zugu.
   the story/presses/my/head
   'That story interests me.'

b) solmdâ tata m yam.
   the story/arrives/my/mind
   'That story pleases me.'

c) kiuug bugsda wâmse.
   moon/frightens/monkies
   'The moon frightens monkies.'
With respect to 'entail' type verbs, i.e. verbs which simultaneously take sentences as subject and complement, in English there is at least one such verb, namely result, which optionally undergoes FLIP. This is shown in (199a,b) where the (a) sentence represents the deep structure subject-object relations and the (b) sentence the form which has undergone FLIP. There are also verbs of this type, e.g. end in and account for, which may not undergo FLIP, as (199c,d) illustrates. Then there are those which obligatorily undergo FLIP, such as follow (199e,f) and entail (199g). When verbs of this latter group undergo the passive, the preposition in may occur as the marker for the agent phrase, e.g. (199h); other verbs which behave like this are include, imply, and for some people presuppose.

(199) a) Smoking dope results in (one's) getting stoned.

b) Getting stoned \{results from \(\text{is the result of}\) smoking dope. c) Smoking dope ends in (one's) getting stoned.

d)*Getting stoned ends (from) smoking dope. (Unacceptable as a transform of (c) above.) e) Getting stoned follows (from) (one's) having smoked dope.

f)*Smoking dope follows (in) getting stoned. (Unacceptable as a transform of (e) above.) g) Getting stoned entails (one's) smoking dope.

h) Smoking dope is entailed in getting stoned.
It is no coincidence that \textit{in} marks both the object of those 'entail' type verbs which have not undergone FLIP, e.g. (199a,c) and the 'agent' phrase of certain verbs of the 'interest' and 'entail' types which have undergone FLIP and then subsequently the passive, e.g. (196c) and (199h). This can be explained by positing that \textit{in} marks the accusative for those verbs mentioned above and that the appearance of this preposition in the passive of verbs which have undergone FLIP reflects the true deep structure relation, i.e. that of object, just as \textit{by} reflects the deep structure relation of subject. At the same time the preposition \textit{from} often marks the deep structure subject of an 'entail' type verb which has been permuted by FLIP to complement position, as exemplified in (199b,e); when such a verb is nominalized \textit{from} is replaced by \textit{of}, e.g. (199b). Note that in English \textit{because of} can always be paraphrased by \textit{as a result of} and so the connection between reason adverbials and 'entail' type verbs is a fact of English.

I have made this rather long digression on English to point out that what R. Lakoff originally proposed as the deep structure for reason adverbials in Latin, which is adopted below for Mooré, has some evidence to support it as a solution for English. The fact that this approach is applicable to three such divergent languages argues strongly in favor of its being a language universal.

The structure in (200) below represents the base
structure for reason adverbials in Moore's, such as those shown in (188), (189) and (190). (I first conceived of the deep structure as being somewhat different from that proposed by R. Lakoff, cf. Peterson (1969b), but I now accept Lakoff's solution and have incorporated it in (200).) The abstract verb of entailment is represented as REASON; like other abstract verbs it has no phonological representation, but its feature composition places it in the class of verbs of declaration, like winegi 'to show/indicate' and dat n yeele 'to mean/entail, etc.' above in (193). I have included the postposition yinga in the deep structure below, although presumably it is inserted by a rule, since its presence is predictable from the main verb (i.e. REASON, winegi, or dat n yeele) and normally postpositions do not occur after factitive nominals.

(200)

```
\[ S_H \]
\[ S_1 \]
\[ NP \]
\[ S_2 \]
\[ NP \]
\[ Vb \]
\[ V \]
\[ AUX \]
\[ S_3 \]
\[ aKulga be \]
\[ yinga \]
\[ V \]
\[ +LOCUTION \]
\[ +REAL \]
\[ +INDEPEND \]
\[ +STATE \]
\[ +ABSTRACT \]
```

'K. was sick'

'K. went home'
Given the structure above I shall assume that there is an optional early rule called REASON-SUBJ-MOVE which attaches the subject NP of the abstract verb REASON (i.e. NP of $S_1$) as the rightmost constituent of the sentential complement of REASON (i.e. $S_3$) and which at the same time removes $S_3$ from its position as complement to REASON and attaches it as the leftmost constituent under the S node which dominates REASON (i.e. $S_1$); $S_1$ in (200) is dominated by the VP of the hyper-sentence (i.e. $S_H$). This rule is given in (201) below.

(201) REASON-SUBJ-MOVE (optional)

\[
SD: \quad X \begin{bmatrix} [ \text{NP} & X \text{[REASON]} \text{\text{+VERB}} \text{\text{+ABSTRACT}} \text{etc.}] \end{bmatrix} X \begin{bmatrix} X ] X ] X ] X ] X \Rightarrow \end{bmatrix}
\]

\[
SC: \quad 1, \emptyset, 4+2+5, 3, \emptyset, \emptyset, 6, 7
\]

![Diagram showing the application of the REASON-SUBJ-MOVE rule](image-url)
SÊ-INSERT (130) and any other rules needed to form factive nominals will apply to \(S_2\) and eventually HYPER-S-RED (60) will delete what remains of \(S_1\), as the tree on the right above shows. The resulting surface sentence is a main clause modified by a reason adverbial having the form of a factive nominal, i.e. (200) would be transformed to the surface sentence in (202).

(202) aKulg kula a sê bê wâ yînga.
Kulga/went home/he/sê/was ill/because
'Kulga went home because of being ill.'

Now in case REASON-SUBJ-MOVE is not applied to (200), FLIP, given in (203) below, will obligatorily apply, i.e. FLIP follows REASON-SUBJ-MOVE. It is assumed that the application of FLIP is controlled by a rule feature of the type proposed by G. Lakoff (1970), since FLIP is a rule which applies to a limited number of verbs. It is designed to accommodate verbs of the 'interest' type, e.g. as in (197) and (198), as well as those of the 'entail' type. This is accomplished by the curly brackets in the SD. The tree given below illustrates the operation of FLIP only on 'entail' type verbs, i.e. those that have sentential subjects and objects.

(203) FLIP

\[
\begin{align*}
\text{SD:} & \quad X & \left[ \left\{ \left[ S & \left\{ \text{NP} \right\} \right] \right\} \right] & X \left[ \left[ +\text{FLIP} \right] \right] & X \left\{ \text{NP} \right\} & X & \Rightarrow \\
& \quad 1 & 2 & 3 & 4 & 5 \\
\text{SC:} & \quad 1+4, 3+2, 5
\end{align*}
\]
Then there is a rule called REASON-COMP-MOVE which follows FLIP, TIM INSERT, and ME INSERT and which attaches the sentential complement of the abstract verb REASON (i.e. $S_2$ in the tree diagram in (204) below) as the rightmost constituent of its subject $S$ (i.e. $S_3$ below) and at the same time attaches the subject $S$ (minus the dominating NP node) as the leftmost constituent under the $S$ node dominating REASON (i.e. $S_1$ below). The numbers on the $S$ nodes in (204) correspond to those in the trees in (200), (201) and (203).

(204) REASON-COMP-MOVE

\[
\begin{array}{c}
SD: \quad X [ \[ [ X ] X [ \text{REASON} ] +\text{VERB} ] S S [ \text{etc.} ] \Rightarrow \\
\quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \\
SC: \quad 1, 3+6+4, 2, \emptyset, \emptyset, 5, \emptyset, 7
\end{array}
\]
Note that since this rule follows Ti INSERT and Me INSERT, tì and me will have been inserted into S2 prior to its operation, since S2 is the complement of a [+LOCUTION, +INDEPEND] verb, i.e. REASON. HYPER-S-RED (60) will eventually delete what remains of S1, including the post-position yìnga. By this process the deep structure in (200) would be converted to the surface sentence in (189).

In addition to explaining the deep semantic relations underlying reason adverbials and relating the two structurally diverse surface forms for these adverbials in Mooré, the above approach provides an explanation for the behavior of a main clause negative with respect to reason clauses. The English sentence in (205a) is ambiguous; (205b,c) are paraphrases of the two senses underlying the (a) sentence.

(205) a) Gustav didn't like the movie because it was pornographic.
    b) The reason Gustav didn't like the movie was because it was pornographic.
c) The reason Gustav liked the movie wasn't because it was pornographic.

(The two senses of (205a) are distinguished in the surface by intonation—when it has the sense of (c) the final pitch is level and when it has the sense of (b) the final pitch is falling as in normal declarative utterances.) These same two senses are expressed in Mooré by two different surface sentences. In the case of a sentence with a meaning like that of (205b), the reason adverbial lies outside of, i.e. to the right of, the discontinuous negative particle ye, as shown in (206a); but in the case of sentences with a sense like that in (205c), the reason adverbial lies within, i.e. to the left of, ye, as shown in (206b). (For remarks on the negative particle ye, cf. section 3.34.)

(206) a) a ka wa ye {a ba sê kî wâ yînga.} {t'a ba kîjî me.}

he/not/come/ye/that/his/father/died/me

'He didn't come because his father died.'
(The reason he didn't come is because his father died.)

b) a ka wa {a ba sê kî wâ yînga(a)} ye.

he/not/come/that/his/father/died/me/ye

'He didn't come because his father died.'
(The reason he came isn't because his father died.)

Given the solution for reason adverbials proposed above, we can explain the facts illustrated in (206) with no new additions to the grammar in the following manner. The deep structure for the sentence in (206a) is that shown in (207a),
where the negative is an auxiliary to (i.e. the matrix verb for) the principal verb of the complement of the abstract verb REASON. (For comments on the negative as an auxiliary verb, cf. section 5.6 and note 11 in section 5.11; for the T Rule YE MOVE, cf. section 5.10 (56).)

(207) a)

\[
\begin{array}{c}
S_H \\
\quad S_1 \\
\quad \quad \text{NP} \quad \text{VP} \\
\quad \quad S_2 \quad \quad \text{NP} \quad \text{Vb} \\
\quad \quad \quad \text{a} \quad \text{ba} \quad \text{ki-ya} \quad \text{yin ga} \\
\quad \quad \quad \text{his_i father died'} \\
\quad S_3 \quad \quad \text{NP} \quad \text{VP} \\
\quad \quad \quad \text{a} \quad \text{Vb} \\
\quad \quad \quad \quad \text{'he_i'} \\
\quad \quad \quad \text{V} \\
\quad \quad \quad \quad \text{a} \quad \text{wa-ya} \\
\quad \quad \quad \quad \text{'he_i came'} \\
\quad \quad \quad \text{ka} \quad \text{ye} \\
\quad \quad \quad \text{'not'}
\end{array}
\]

b) (via FLIP and REASON-COMP-MOVE)

\[
\begin{array}{c}
S_3 \\
\quad \text{NP} \quad \text{VP} \\
\quad \quad \text{a} \quad \text{Vb} \quad \text{VP} \quad \text{ye} \\
\quad \quad \quad \text{V} \quad \text{Vb} \\
\quad \quad \quad \quad \text{ka} \quad \text{V} \\
\quad \quad \quad \quad \quad \text{wa} \quad \text{ye} \\
\quad \quad \quad \quad \quad \text{t'a} \quad \text{ba} \quad \text{ki i me} \\
\quad \quad \quad \quad \quad \text{'because his father died'} \\
\quad \quad \quad \quad \text{S_2}
\end{array}
\]

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Whichever derivational path (207a) follows, $S_3$, whose syntactic main verb is the negative ka...ye, will end up as the surface main clause, while $S_2$ will be attached under $S_3$ as right sister to the VP which dominates the negative (i.e. either by REASON-SUBJ-MOVE or by REASON-SUBJ-MOVE) and will end up as the surface adverbial clause. YE MOVE, a post cyclic rule, then moves ye to the end of its VP, which leaves the surface reason adverbial outside, i.e. to the right, of ye, as shown in the surface tree in (207b).

On the other hand, the deep structure for the sentence in (206b) is that shown in (208a), where the negative is a matrix verb for the abstract verb REASON. (Note that this is not prohibited by any of the meta-conditions in section 7.4 (113b), since REASON is not a performative verb.) The subject of the negative auxiliary is identical to the subject of the complement (i.e. $S_4$) of the abstract verb REASON; this deep structure sentential complement becomes the surface main clause.
(208) a)  
\[
\begin{array}{c}
S_h \\
\downarrow \\
S_1 \\
\uparrow \\
NP \\
\downarrow \\
a_i \\
'he_i' \\
\uparrow \\
VP \\
\downarrow \\
v_b \\
\uparrow \\
S_2 \\
\uparrow \\
NP \\
\downarrow \\
v \\
\downarrow \\
ka \\
'not' \\
\uparrow \\
S_3 \\
\uparrow \\
NP \\
\downarrow \\
v_b \\
\uparrow \\
S_h \\
\uparrow \\
VP \\
\downarrow \\
a_i \\
'va-vá' \\
\end{array}
\]

b) (Via FLIP and REASON-COMP-MOVE)  
\[
\begin{array}{c}
S_1 \\
\uparrow \\
NP \\
\uparrow \\
a \\
'he' \\
\uparrow \\
VP \\
\downarrow \\
v_b \\
\uparrow \\
S_h \\
\uparrow \\
ye \\
\uparrow \\
V \\
\downarrow \\
ka \\
'didn't' \\
\uparrow \\
V \\
\downarrow \\
tá ba kii me \\
\uparrow \\
V \\
\downarrow \\
wa \\
'come'
\end{array}
\]

As with (207a), whichever derivational path (208a) follows, $S_3$ (i.e. the surface reason adverbial clause) will be attached under $S_h$ (i.e. the surface main clause) and $S_h$ will be moved.

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up under the $S_2$ node as the leftmost constituent. Then, after HYPER-S-RED (60) and pruning have removed the remains of $S_2$, EQUI-NP-DEL will remove the subject of $S_4$ on identity with that of $S_1$ and YE MOVE will move ye to the end of the VP of $S_1$, which includes $S_4$. Since $S_4$ contains $S_3$, the reason adverbial will be within ye, i.e. to the left of it, as shown in the surface tree in (208b).

A final point which the above analysis will account for is raised by B. Rutherford (1970). He points out that reason adverbials, among other sentential adverbs, may have two senses in that they may closely modify the main clause ('restrictive') or they may be 'non-restrictive' of the main clause; in the latter case because in English may be replaced by for. Thus the reason adverbial in the English sentence in (209) does not express the reason for Harvey's being at home, but rather the reason for the speaker's declaring that he is at home. Generally, the non-restrictive type is distinguishable by a slight pause between the two clauses, which I shall indicate with a comma.

(209) Harvey is at home, because I saw his car there. Reason adverbials in Moöré may express the same non-restrictive sense, as shown in (210):

(210) a) a na n waa me, t'm yâ a la teng pügê.

he-going/to/come/me/that/I/saw/him/la/town/in

'He's going to come, because I saw him in town.'
b) a na n waa me, m sē yā a teng ppe ō wā yinga.

he going to come me I sē saw him town in wā yinga

'He's going to come, because I saw him in town.'

(Notice that whereas a 'restrictive' reason adverbial which has the form of a nominalization causes the elision of a preceding post-verbal particle me, e.g. cf. (190) above and following comments, such elision does not occur when the adverbial is 'non-restrictive', e.g. as in (210b) above.)

Rutherford analyzes the 'non-restrictive' type as being a modifier of the hyper-sentence, which is the deep structure matrix for the surface main clause, while the 'restrictive' type is viewed as modifying the deep structure constituent of the hyper-sentence, i.e. the surface main clause.

This analysis of 'non-restrictive' reason adverbials, which I believe to be correct, can be incorporated into the solution outlined in the preceding pages without adding any new rules or mechanisms to the grammar. This is done by assigning a structure of the type shown in (211) as the deep structure for sentences like those in (210), where a hyper-sentence (S̄H) which contains the surface main clause (S3) as complement to the abstract performative verb is embedded as complement to the abstract verb REASON, and the surface 'non-restrictive' adverbial (S2) is embedded as subject to REASON.
9.2 Purpose Adverbials

Purpose adverbials are identical in certain instances to complements of verbs of willing (as described in section 5.4): they take 'à at the head of the clause and they are in the subjunctive, i.e. they take da as the negative marker, they may not contain the post-verbal particle me in the affirmative, and the main verb of a purpose adverbial is never marked for perfective aspect in the surface. These points are illustrated in (212).

(212) a) m waa me tà bamb kuli.

I/came/me/that/they/leave

'I came so that they might leave.'

b) m waa me tà bamb da kul ye.

I/came/me/that/they/not/leave/ye

'I came so that they wouldn't leave.'

When the subject of the purpose adverbial clause is identical to the subject of the main clause, the purpose clause undergoes EQUI-NP-DEL, as (213a) shows; the future auxiliary ná,
which is itself a verb (cf. section 5.6), appears in the form which has undergone EQUI-NP-DEL, though never in the form which has not, as (213b) shows.

(213) a) m waa me n ná n gesamba.
    I/came/me/to/going/to/see/them
    'I came (in order) to see them.

b) m waa me tì bamb na n kuli.
    I/came/me/that/they/going/to/leave

Like reason adverbials, purpose clauses have an alternative form which is obligatory in focus position. The form is that of a factive nominalization in which the surface purpose clause is the complement of the verb yili, i.e. yili is the main verb of the factive nominal; the entire nominalization is followed by the postposition yìngà (e.g. as in (214a)), which may be optionally deleted along with the final (w)ë of the nominalization (e.g. as in (214b)). The verb yili appears nowhere else in the language; speakers are unable to provide a meaning for it and regard the sequence ñà yìlë as a formula meaning 'in order that...'. Yet, it is clearly a verb, because the preverbal particle ñà (cf. note 9 in section 5.11) and the verbal suffix -ë (cf. sec. 3.37, note 47) occur with it, and the clause which follows it obeys all the rules for complements of verbs of desiring, such as TÌ-INSERT, SUBJUNCT NEG, and EQUI-NP-DEL, e.g. as in (214c,d). The fact that only this nominalized form can occur in focus position is illustrated in (214e,f).
(214) a) m waa se nà yile tì bamb kulà yìnga.
   I/came/se/nà/[desire]-ë/that/they/leave+
   (w)à/yìnga
   'I came so that they might leave.'

b) m waa se nà yile tì bamb kuli.
   I/came/se/nà/[desire]-ë/that/they/leave
   'I came so that they might leave.'

c) m waa se nà yile tì bamb da kul ye.
   I/came/se/nà/[desire]-ë/that/they/not/leave/
   ye
   'I came so that they wouldn't leave.'

d) m waa se nà yile n ges bamba.
   I/came/se/nà/[desire]-ë/to/see/them
   'I came (in order) to see them.'

e) yaa se nà yile tì bamb kul la m wayà.
   is/se/nà/[desire]-ë/that/they/leave/that/I/
   come-ya
   'It's in order that they might leave that I
   have come.'
   (-ya = perfective, which normally elides,
   cf. section 3.32)

f) *yaa tì bamb kul la m wayà.
   is/they/leave/that/I/come-ya

The fact that EQUI-NP-DEL occurs even though there is
no apparent subject for the verb yili (e.g. (214d)) leads to
the hypothesis that in deep structure the subject of yili is
always identical to the main clause subject, and therefore
it is deleted in the surface. (This is accomplished by the
rule in (220) below.)

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There is a third possible surface variant of purpose adverbials: an action nominal followed by the postposition yînga, as shown in (215). (For comments on action nominals, cf. note 10 in section 5.11.)

(215) m waa bamb kulbā yînga.

I/came/their/leaving+(w)ā/yînga

{ 'I came so that they might leave.'
  'I came because of their leaving.'

(As indicated in the gloss, (215) is ambiguous and may be interpreted as a reason adverbial; this interpretation can be accounted for in a natural way from a deep structure like that in (200) where S2, the surface reason clause and the deep structure subject of the abstract verb REASON, is generated as an action nominal rather than a factive nominal.) It was noted in section 5.4 (28) that the sentential complement of a verb of desiring may optionally take the form of an action nominal in the surface.

In proposing a base structure for purpose clauses, not only must we provide an explanation for the three surface variants mentioned above, but we must also account for the close structural and semantic relationship between purpose and reason adverbials. For example R. Lakoff (1968) has pointed out that both are covered by the same interrogative WH form why. In Mooré why is expressed by the WH form bôe 'what?' either preceded by the complementizer tí or followed by the postposition yînga: tí bôe/bôe yînga 'why?'. Thus in both Mooré and English the question in (216) may take
either a reason adverbial, as in (216a), or a purpose adverbial, as in (216b), as an appropriate answer.

(216) Q: yaa bõe ſĩngə la fo wayā?
    is/what/on account of/that/you/come-ям
    'Why is it that you have come?'
A: a) yaa bəm bə sə kulf yəŋə.
    is/they/sə/left/because-(of)
    '(It's) because they left.'

  b) yaa sə nə yilə tə bəmm əm əti.
    is/sə/nə/[desire]-əm/that/they/leave
    '(It's) so that they might leave.'

The deep structure shown in (217) accounts for the diverse forms for purpose adverbials given in (212), (213), (214), and (215) as well as the link with reason adverbials in portraying purpose adverbials as having the form of a reason adverbial where the sentential subject of the abstract verb REASON (S2) has as its main verb yile, a verb of willing whose complement (S4) is the surface purpose clause. Note that yili is [¶ABSTRACT], since in certain instances it appears in the surface, e.g. (214), while in other cases it does not, e.g. (212), (213) and (215). In other words, yili appears in the surface when it is the main verb of a factive nominalization and has a true sentential complement. The parentheses around the nodes NP and NOM which dominate S4 indicate that the complement to yili may be a normal sentential complement or an action nominal, as is the case with
all verbs of willing (cf. section 5.4 (28)); this explains the third form for purpose adverbials shown in (215).

Finally, the complement of \textit{vil}i (S4) contains the future auxiliary \textit{na}, as is the case with all verbs of willing (cf. section 5.4 (25), (26), (27)).

\[(217)\]

Thus, following R. Lakoff (1968), I am making the claim that purpose adverbials of the type 'someone does X in order that Y' have underlying them a structure with the sense: 'someone i
does X because he wants Y'. Alexandre (1953, Vol. I, p. 90 section 418) recognizes this for Moore when he cites the example repeated below in (218) as the form for a purpose adverbial in focus, where date 'to want' occupies the place of yili. (Alexandre does not record the form of purpose adverbials with yili.)

\[(218)\] yaa m sē dat n kēng daagā yīnga la m zegd m koobo.

is/I/sē/want/to/go (to)/market+(v)ē/because/
that/I/hurry/my/cultivating

'It's \{in order because I want\} to get to the market that
I am hurrying in my cultivating.'

In order to get the surface forms in (212) through (215) from the deep structure in (217), it is necessary to add two rules. First, the future auxiliary ná must be deleted in certain contexts, i.e. it must be deleted from the complements of all verbs of command and willing except [+ABSTRACT] yili when the complement to yili has undergone EQUI-NP-DEL, e.g. compare (213a) with (214d)--yili is [-ABSTRACT] in the latter. This special instance where ná is not deleted is accounted for by condition (1) on PUT-DEL below; this condition prohibits the operation of the rule just in case ná appears in a complement to [+ABSTRACT] yili which has undergone EQUI-NP-DEL as signaled by the presence of the complementizer n. Thus ná will show up in purpose adverbials like that in (213a), but not in those like (213b) where the purpose adverbial clause has not undergone EQUI-NP-DEL or where
yili is [~\text{-ABSTRACT}], i.e. where it appears in the surface. Condition (2) simply stipulates that ná must be contained in a sentence which is a complement to the [~\text{-REAL}] verb mentioned in the SD, i.e. they are dominated by the same VP. By mentioning only the feature [~\text{-REAL}] in the SD, complements of both verbs of command and willing are included.

(219) FUT-DEL

\[
\text{SD: } X \xrightarrow{\text{\([+\text{Verb}\)}} \xrightarrow{\text{\([-\text{REAL}\)}} X \xrightarrow{\text{\([\text{\([n\]}\)}} X \xrightarrow{\text{\([-\text{LOCUTION}\)}} Vb \xrightarrow{\text{\([\text{\([+\text{VERB}\)}} \xrightarrow{\text{\([-\text{LOCUTION}\)}} Vb etc.\]}
\]

X \xrightarrow{\text{\([d\)}} X \Rightarrow

\text{SC: } 1, \emptyset, 3

\text{Conditions: } 1) \text{ if } a = \text{[yili~\text{-LOCUTION}, +\text{ABSTRACT}], } c = \emptyset

2) d > a \text{ and } b

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Finally, we must formulate a special rule which deletes the subject of yili on identity with the subject of the main clause to which it is subordinate. This applies after REASON-SUBJ-MOVE (201) and REASON-COMP-MOVE (204) and before EQUI-NP-DEL.

(220) PURPOSE-IDENT-SUBJ-DEL

\[
SD: X \left[ \frac{NP}{a} \right] VP \left[ \frac{NP}{b} \right] \left[ \frac{NP}{x} \right] \Rightarrow
\]

SC: 1, ∅, 3

Condition: \( a = b \)

The above rule accounts for the lack of a subject NP for yili in the sentences of (214). Since the subject of yili must always be identical to the subject of the main clause, the verb yili is marked as obligatorily meeting the SD of PURPOSE-IDENT-SUBJ-DEL (cf. G. Lakoff (1965) for details).
10. A List of the Rules Proposed in Part II

In the list below the numbers in parentheses to the right of each rule refer to numbers in the text where the rule or a subpart of it was previously mentioned.

**Phrase Structure Rules**

PS1)  
\[ S \rightarrow NP \ VP \ (S) \]  
(44), (85)

PS2)  
\[ VP \rightarrow Vb \ (\bar{NP}) \ (TIME) \ \left\{ \begin{array}{l} \bar{S} \\ S \end{array} \right\} \]  
(45), (106), (169)

PS3)  
\[ \begin{array}{l} a) \ NP \rightarrow \left\{ \begin{array}{l} \bar{NP} \bar{NP} \\ \bar{NOM} \ D \end{array} \right\} \\ b) \ NOM \rightarrow \left\{ \begin{array}{l} \bar{N} \ \bar{NUM} \\ \bar{NOM} \ S \end{array} \right\} \\ c) \ NUM \rightarrow \left\{ \begin{array}{l} S_g \\ P_l \end{array} \right\} \end{array} \]  
(46), (137b)

PS4)  
\[ \begin{array}{l} a) \ Vb \rightarrow \ (T) \ V \ (AS P) \ (-\bar{G}) \\ b) \ T \rightarrow \left\{ \begin{array}{l} \bar{da(g)} \\ \bar{n\bar{a}} \end{array} \right\} \\ c) \ ASP \rightarrow \left\{ \begin{array}{l} I \\ P \end{array} \right\} \end{array} \]  
(47)

PS5)  
\[ \bar{S} \rightarrow S \ S^* \]  
(107), (143)

PS6)  
\[ \text{TIME} \rightarrow NP \ (poorê) \]  
(169)

**Lexical Redundancy Rules**

LR1)  
\[ [-\text{REAL}] \rightarrow [-\text{INDEPEND}] \]  
(39a)

LR2)  
\[ [+\text{LOCUTION} \ +\text{REAL}] \rightarrow [+\text{INDEPEND}] \]  
(39b)

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LR3) \([+[-_NP\ S]] \rightarrow [-[-_S]]\) & (39c), (42), (111a)

LR4) \([+[-_S]] \rightarrow [-[-_NP\ S]] \rightarrow [-[-_NP\ S]]\) & (39d), (43), (111b)

LR5) \([+[-_S]] \rightarrow [-LOCUTION]] \rightarrow [-INDEPEND\ ]\) & (112)

Transformational Rules

The format of the rules below assumes certain conventions which are stated in full at the beginning of section 5.10. The list numbers indicate the order of application.

T1) REASON-SUBJ-MOVE (optional) (201)

\[ SD: \ X \ [NP \ X \ \begin{array}{c} \text{REASON} \\ \text{+VERB} \\ \text{+ABSTRACT} \end{array} \ X \ [X] \ X \ ) \ X \ \Rightarrow \]

\[ \begin{array}{ccccccc}
1 & 2 & 3 & 4 & 5 & 6 & 7 \\
\end{array} \]

\[ SC: \ 1, \emptyset, 4+2+5, 3, \emptyset, \emptyset, 6, 7 \]

T2) FLIP (203)

\[ SD: \ X \ [\ \begin{array}{c} \text{NP} \\ \text{VP} \end{array} \] \ X \ \begin{array}{c} \text{+VERB} \\ \text{+FLIP} \end{array} \ X \ \begin{array}{c} \text{NP} \\ \text{VP} \end{array} \ X \ \Rightarrow \]

\[ \begin{array}{ccccccc}
1 & 2 & 3 & 4 & 5 \\
\end{array} \]

\[ SC: \ 1+4, 3+2, 5 \]

T3) D.O. COPY (181)

(Other case rules such as LOC COPY, INSTRUMENT COPY, etc., which are not formally presented in this work, would appear in this same general position in the cycle—cf. section 8.2.)
\[
SD: \begin{array}{c}
X \left[ \frac{a}{NP} X \left[ +VERB +TAKE \right] X NP \right] \frac{b}{NP} X \left[ +VERB +IO \right] X NP X \Rightarrow \\
1 & 2 & 3 & 4
\end{array}
\]

SC: 1, 2, 3+2, 4
Condition: \( a = b \)

T4) D. O. RED (optional)

\[
SD: \begin{array}{c}
X \left[ X \right] \left[ X \left[ +VERB \right] X \right] \Rightarrow \\
S & VP & S
\end{array}
\]

SC: 1, 2, 3

T5) ME INSERT

\[
SD: \begin{array}{c}
X \left[ +VERB +INDEPEND \right] X \left[ X \left[ S \right] \right] \left[ X \left[ \Sigma \right] \right] X \Rightarrow \\
1 & 2
\end{array}
\]

SC: 1+me, 2
Condition: \( a \neq ye \)

T6) TI' INSERT

\[
SD: \begin{array}{c}
X \left[ +VERB +LOCUTION \right] X \left( \left[ \left[ X \right] \right] \right) X \left( \left[ S \right] \right) \left[ \Sigma \right] S NP \left[ S \right] VP \Rightarrow \\
1 & 2
\end{array}
\]

SC: 1, ti'+2
Condition: if \( \alpha \) and \( \gamma = +, \beta \neq - \)
T7) REASON-COMP-MOVE

SD: \[
X \begin{array}{c}
[ [ X ] X ] \\
S \ NP \ S \ S
\end{array}
\frac{\text{REASON}}{} \frac{\text{+VERB}}{} \frac{\text{+ABSTRACT}}{}
\Rightarrow
\]

SC: 1, 3+6+4, 2, \emptyset, 5, \emptyset, 7

T8) PURP-IDENT-SUBJ-DEL

SD: \[
X \begin{array}{c}
[ \frac{\text{NP}}{S} ] \ [ \frac{\text{VP}}{S} ] \ [ \frac{\text{a}}{NP} ] \ [ \frac{\text{b}}{yili} ] \ [ \frac{\text{X}}{X} ]
\end{array}
\Rightarrow
\]

SC: 1, \emptyset, 3

Condition: \ a = b

T9) LA INSERT (optional)

SD: \[
X \begin{array}{c}
[ \frac{\text{NP}}{S} ] \ [ \frac{\text{a}}{X} ] \ [ \frac{\text{b}}{NP} ] \ [ \frac{\text{X}}{X} ]
\end{array}
\Rightarrow
\]

SC: 1, \emptyset, 2+4

Condition: \ a = b

T10) EQUI-NP-DEL

SD: \[
X \begin{array}{c}
[ \frac{\text{NP}}{S} ] \ [ \frac{\text{a}}{X} ] \ [ \frac{\text{b}}{\text{VERB}} ] \ [ \frac{\text{c}}{\text{INDEPEND}} ]
\end{array}
\Rightarrow
\]

\[
X \begin{array}{c}
[ \frac{\text{NP}}{S} ] \ [ \frac{\text{a}}{X} ] \ [ \frac{\text{b}}{\text{VP}} ] \ [ \frac{\text{c}}{\text{X}} ] \ [ \frac{\text{d}}{\text{S}} ] \ [ \frac{\text{S}}{\text{S}} ] \ [ \frac{\text{S}}{\text{S}} ] \ [ \frac{\text{S}}{\text{S}} ] \ [ \frac{\text{S}}{\text{S}} ]
\end{array}
\Rightarrow
\]

SC: 1, \emptyset, 3, \emptyset, 4

Conditions:
1) \ a = b
2) if \ d = \ VP, \ \alpha = -
3) \ c \not\in \text{nan}+ka

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T11) TINSERT (53) (cf. the comments following (87))

\[
\begin{align*}
SD: & \quad X \lorb X \left[ \left[ [ X ] \right] \right] X \\
\quad & \quad \Sigma S \ NP \quad \{S\} \{VP\} \\
\quad & \quad \quad \{X\} \{S\} \\
\quad & \quad 1 \quad 2 \\
SC: & \quad 1, t1+2
\end{align*}
\]

T12) DEP-CONJ-REVERSE (optional) (168)

\[
\begin{align*}
SD: & \quad X \left[ \left[ \left[ X \right] \right] \right] X \Rightarrow \\
\quad & \quad S \ NP \quad S \ NP \quad \{t1\} \quad X \quad X \\
\quad & \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \\
SC: & \quad 1, [4+6+2+5+3+], \emptyset, \emptyset, \emptyset, 7 \\
\quad & \quad S \ S \\
Conditions: & \quad 1) a \succ b \text{ (i.e. } a \text{ 'directly dominates } b \text{ and therefore } b \text{ is not a sentential verb complement.)} \\
\quad & \quad 2) \text{ if } c = la, \ a \succ wakat \ w\text{ and} \\
\quad & \quad \quad b \succ wakat \ ninga
\]

T13) TIME-REL-1 (171)

\[
\begin{align*}
SD: & \quad X \left[ \left[ wakato \right] \left[ wa \right] X \right] \left[ \left[ t1 \right] \right] X \Rightarrow \\
\quad & \quad NOM \quad NOM \quad D \quad D \quad S \quad S \quad \{la\} \\
\quad & \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \\
SC: & \quad 1+3+5+2, \emptyset, \emptyset, \emptyset, 6 \\
\quad & \quad Conditions: \quad 1) a = c \\
\quad & \quad 2) \text{ if } b = t1, \text{ TIME-REL-1 is optional}
\end{align*}
\]
T11) TIME-REL-2

\[ \text{SD: } X \left[ X \left[ \text{waketo} \right] \left[ \text{ninga} \right] X \right] \left[ \text{ti} \right] X \left[ \text{wakato} \right] \left[ \text{wâ} \right] X \right] \Rightarrow \]

SC: 1, ∅, 3+2+4

Condition: a = b

T15) SUBJUNCT-NEG

\[ \text{SD: } X \left[ +\text{VERB} \right] X \left[ X \left[ \text{kâ} X \right] \right] X \Rightarrow \]

SC: 1, dâ, 3

T16) P-DEL

\[ \text{SD: } X \left[ +\text{VERB} \right] \left[ +\text{INDEPEND} \right] X \left[ X \left[ \text{P} X \right] \right] \Rightarrow \]

SC: 1, ∅, 3

Condition: if a = VP, \( \alpha = - \)

T17) I-DEL (optional)

\[ \text{SD: } X \left[ X I X \right] \left[ X I X \right] \Rightarrow \]

SC: 1, ∅, 3

T18) SÊ INSERT

\[ \text{SD: } X \left[ \left[ \text{NOM} \right] \left[ \text{NP} X \Rightarrow \right] \right] \left[ \text{NP} X \right] \left[ \text{S} \right] \Rightarrow \]

SC: 1+sê, 2

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T19) ACTION NOMINAL  

\[ SD: \quad X \quad [\quad [\quad NP \quad [\quad [\quad +\text{VERB} \quad \text{NOM} \quad S \quad \text{VP} \quad V \quad \text{VP} \quad \text{Vb} \quad \text{Vb} \quad ]\quad ]\quad ]\quad ]\quad ]\quad ] \quad X \quad \Rightarrow \]

\[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \]

SC: \quad 1+5, \quad 2+af, \quad \emptyset, \quad 4, \quad \emptyset, \quad 6

T20) ME TRANSPORT (optional)  

\[ SD: \quad X \quad \text{me} \quad [\quad [\quad X \quad ]\quad ] \quad X \quad \Rightarrow \]

\[ Vb \quad \text{VP} \quad Vb \quad \]

\[ 1 \quad 2 \quad 3 \quad 4 \]

SC: \quad 1, \quad \emptyset, \quad 3+2, \quad 4

Condition: \quad a \geq b

T21) CM-INSERT  

\[ SD: \quad X \quad V \quad (\text{ASP}) \quad (\Rightarrow) \quad X \quad \Rightarrow \]

\[ 1 \quad 2 \]

SC: \quad 1+la, \quad 2

Condition: \quad a \neq \emptyset

T22) BI INSERT  

\[ SD: \quad X \quad [\quad X \quad S \quad [\quad X \quad ]\quad ] \quad \Rightarrow \]

\[ \frac{2}{1} \quad S \quad \]

SC: \quad 1+bi+2

T23) NE INSERT  

\[ SD: \quad X \quad \text{NP} \quad \text{NP} \quad X \quad \Rightarrow \]

\[ 1 \quad 2 \]

SC: \quad 1+ne+2

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T24) **FUT-DEL**

\[
\text{SD: } X \left[ +\text{VERB} \right] \times \left[ \begin{array}{c} a \\ \text{-REAL} \end{array} \right] X \left[ \begin{array}{c} b \\ \text{(n)} \end{array} \right] \left[ \begin{array}{c} c \\ \text{VP} \end{array} \right] \left[ \begin{array}{c} \text{na} \\ \text{-LOCUTION} \end{array} \right] \left[ \begin{array}{c} \text{VP} \\ \text{Vb} \end{array} \right] X \Rightarrow \frac{\text{a}}{2} \frac{\text{b}}{3} \frac{\text{c}}{1}
\]

**SC:** 1, Ø, 3

**Conditions:**
1) if \( a = \left[ +\text{VERB} \right] \), \( c = \phi \)
2) \( d > a \) and \( b \)

T25) **HYPER-S-RED**

\[
\text{SD: } X \left( \text{NP} \right) \left[ +\text{VERB} \right] \left[ +\text{ABSTRACT} \right] X \left( \text{S} \right) \times \Rightarrow \frac{\text{a}}{1} \frac{\text{b}}{2} \frac{\text{c}}{3}
\]

**SC:** 1, Ø, 3

T26) **CONJ-PART-ADJUST**

\[
\text{SD: } X \left[ \begin{array}{c} \text{la} \\ \text{bI} \end{array} \right] \left[ \begin{array}{c} \text{a} \\ \text{bI} \end{array} \right] \left[ \begin{array}{c} \text{NP} \\ \text{X} \end{array} \right] \Rightarrow \frac{\text{a}}{1} \frac{\text{bI}}{2} \frac{\text{la}}{3} \frac{\text{bI}}{4}
\]

**SC:** 1, Ø, 3, 2+4

T27) **DER-SUBJ-CONJ** (optional)

\[
\text{SD: } X \left[ \begin{array}{c} \text{a} \\ \text{b} \end{array} \right] \left[ \begin{array}{c} \text{c} \\ \text{NP} \end{array} \right] \left[ \begin{array}{c} \text{NP} \end{array} \right] \left[ \begin{array}{c} \text{la} \\ \text{NP} \end{array} \right] \left[ \begin{array}{c} \text{d} \\ \text{VP} \end{array} \right] \left[ \begin{array}{c} \text{e} \\ \text{S} \end{array} \right] \left[ \begin{array}{c} \text{S} \\ \text{NP} \end{array} \right] X \Rightarrow \frac{\text{a}}{1} \frac{\text{b}}{2} \frac{\text{c}}{3} \frac{\text{d}}{4} \frac{\text{e}}{5}
\]

**SC:** 1, Ø, Ø, 4, 2+5

**Conditions:**
1) \( a > \left[ \begin{array}{c} \text{la} \\ \text{bI} \end{array} \right] \) (NP \( \left[ \begin{array}{c} \text{la} \\ \text{bI} \end{array} \right] \)) or Ø
2) \( b \neq d \)
3) \( c = e \)
T28) DER-COMP-CONJ (optional) \text{(123)}

SD: \[
\begin{array}{c}
\text{X} & \text{NP} & \text{X} & \{\text{bi}\} & \text{i} & \text{VP} & \text{S} & \text{S} & \{\text{NP}\} & \{\text{bi}\} & \text{NP} & \text{X} & \{\text{bi}\} & \text{i} & \text{VP} & \text{S} \\
\text{a} & \text{b} & \text{c} & \text{d} & \text{e} & 1 & 2 & 3 & 4 & 5 & 6
\end{array}
\]

SC: 1+3+5, 2, \emptyset, \emptyset, \emptyset, 6

Conditions:
1) a = c
2) b \neq d
3) e = \{\text{NP}\}, \{\text{bi}\}, \{\text{NP}\}^* \text{ or } \emptyset

T29) DER-CONJ-ADJUST \text{(124)}

SD: \[
\begin{array}{c}
\text{X} & \{\text{Vb}\} & \{\text{NP}\} & \{\text{S}\} & \{\text{bi}\} & \text{i} & \{\text{NP}\} & \{\text{S}\} & \{\text{bi}\} & \text{i} & \text{VP} & \text{X} & \Rightarrow
\end{array}
\]

SC: 1, \[\text{+2+}\], 3
\[
\{\text{NP}\} & \{\text{S}\} & \{\text{bi}\} & \text{i} & \{\text{NP}\} & \{\text{S}\} & \{\text{bi}\} & \text{i}
\]

T30) YE MOVE (Post-cyclic) \text{(56)}

SD: \[
\begin{array}{c}
\text{X} & \text{ye} & \text{X} & \text{X} & \Rightarrow
\end{array}
\]

SC: 1, \emptyset, 3+2, 4

Condition: b \geq a

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APPENDIX: Rabbit and Hyena's Search for Eggs, a Mooré Folktale

The folk tale below was originally transcribed (with tone unmarked) by R. P. Alexandre (1953b). I have re-transcribed it in the revised orthography as spoken in the Yako dialect. There are apparently two different endings, both of which are given.

Súamb né kàtr sè da bao gélà
rabbit/and/hyena/sè/were/searched for/eggs
'Rabbit's and Hyena's searching for eggs"

Súamb né kàtr n dá yëel t'b këng wëoogé
rabbit/and/hyena/who/had/said/that/they/go/to the bush/
(It was) Rabbit and Hyena (who) said that they should go to the bush

ñ ti bao gélà, la b kënga mé. là súamb yàa gélà, ti
and/go/look for/eggs/,and/they/went/and/rabbit/saw/eggs/and/
and go look for eggs, and they went. And Rabbit saw some eggs and

katr sük á: "yàa áwanà?", ti súamb yëel: "yaa píiga"
hyena/ask/him/are/how many/and/rabbit/say/are/ten/
Hyena asked him: "How many are there?", and Rabbit answered: "There are ten."

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ti katř yęel: "yaa máám n yá zàamé," là sóamb kis a là
and/hyena/say/is/me/who/saw/yesterday/and/rabbit/gave/him/la
and Hyena said: "It was me who saw them yesterday," and
Rabbit gave them to him.

mé. là b két n bàoodá mé, là sóamb lëb n
me/and/they/continued/to/keep searching/me/and/rabbit/again/
And they continued searching, and Rabbit again

yàa gélà, ti katř sük á: "yàa áwánà?" ti sóamb yęel:
see/eggs/and/Hyena/ask/him/are/how many/and/rabbit/say/
saw some eggs, and Hyena asked him: "How many are there?"
and Rabbit said:

"yaa píig la nú," ti katř yęel "yaa máám n yá da-bitë"
are/ten/and/five/and/hyena/say/is/me/who/saw/day before
"There are fifteen," and Hyena said "It's me who saw them
day before yesterday,"

tì sóamb yęel: "wa déegë!", la katř deega mé n paas.
and/rabbit/say/come/take/and/hyena/took/and/add/
and Rabbit said: "Come and take them," and Hyena took them
and added them to his collection.

là b lëb n göodá mé, là sóamb lë yàa gélà,
and/they/returned/to/walking/me/and/rabbit/again/see/eggs/
And they started walking again and Rabbit again saw some eggs

ti katř sük á: "yàa áwánà?" ti sóamb yęel: "yaa gél anú,"
and/hyena/ask/him/are/how many/and/rabbit/say/are/eggs/five/
and Hyena asked him: "How many are there?" and Rabbit said:
"There are five eggs,"

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and Hyena said: "It's me who saw them three days ago." And they started
walking, and Rabbit again saw some eggs and Hyena asked him:

"Yaa awah yaaasaw," ti sōamb yèele: "Yaa gell ayémré, " ti katr
are/how many/again/and/rabbit/say/is/egg/one/and/hyena/
"How many are there?", and Rabbit said: "There is one (egg),"
and Hyena
yèele: "mam pà yà dè ye," ti sōamb djk n sùi a korgè.
say/I/not/see/that/ye/and/rabbit/take/and/ put in/his/sack/
said: "I didn't see that one," and Rabbit took it and put it
in his sack.

Là b kuìà mé.
and/they/went home/me./
And they went home.

`akatr' sè maan zàambò, à páamá gél wùsgo, là asóamb ká
hyena/ség/made/trickery/he/had/eggs/many/and/Rabbit/not/
As a result of having indulged in trickery, "Hyena had
many eggs, and Rabbit didn't

paam wùsgo ye. `asóamb kúìà yìriv n ti rug n wàb
have/many/ye./Rabbit/went home/village/and/go/cook/and/eat/
have many. Rabbit went home and cooked and ate
né a págā là a kāmbā là a yák gel ayib ŋ

with/his/wife/and/his/children/and/he/take/eggs/two/and/

with his wife and his children and he took two eggs,

kaoog n sóog a yēdgā là a kāmb yēdsé ŋ

break/and/smear/has/rear end/and/his/children/rear ends/and/

broke them and smear them on his and his children's rear ends and

yik n ti yeel katr t'a rǐk a gelā n lobe, t'ā

go out/and/go/tell/hyena/that/he/take/his/eggs/and/throw/that/

went out and told Hyena to take his eggs and throw them out, because

sā n wābe, a nā n pùuga sāagā, tī ye kā paam

he/if/to/eat/he/going/to/have/dysentery/,that/he/not/have

if he were to eat them, he would get dysentery, and that he (Rabbit) didn’t have

gél w̃s go ye, là a w̃bābílifu bala, là yē sāadā mé; tī
good are ended, let’s a wababalá, let's ye used me; ti

eggs/many/ye/and/he/ate/few/only/and/he/shitting/me/and/

many eggs, and had eaten only a few, and he was shitting; and

katr w̃k a rennā ŋ ti lōbe, t’āsōm tā yungō ŋ

hyena/gather/his/those/and/go/throw/and/Rabbit/come/night/and

Hyena gathered his up and threw them out, and Rabbit came in the night

kēng ne a págā ŋ ti w̃k la a kēs bilfu bala; t’ākatr

go/with/his/wife/and/go/gather/and/he/leave/few/only/and/hyena

with his wife and gathered some up, leaving only a few, and Hyena.
yik yíbeoogó n kéng n tì yá t'á gélâ ka leb n
arise/morning/and/go/and/see/that/his/eggs/not/still/to/
arose the next morning and saw that his eggs were no longer
wàoog yé, t'á ti yëel asóambá t'á wá n
numerous /ye/and/he/go/tell/rabbit/that/ they /came/and/
umerous and he went and told Rabbit that someone came and
wëka á gél yëngë zàngá; t' á asóamb yëel àkatrí t'a
take/ his/eggs/in the night/all./and/rabbit/tell/hyena/that/he/
took all his eggs during the night and Rabbit told Hyena to
bëd t'á yök a sòbá, t'ákatrí bëde,
set a trap/that/they/trap/his/possessor/and/hyena/set a trap/
set a trap in order to catch him and Hyena set a trap,
la yëng së wá n ta la sòamb së le kéng n
and/night/sæ/came/and/arrive/that/rabbit/sæ/again/came/to/
and when night came, Rabbit came back to
ná n tì wük gélâ, la bëdge yök a là mé,
be going/to/go/gather/the eggs/but/the trap/caught/him/la/mé/
gather the eggs, but the trap caught him
t'á pë töe n lëb n kéng yës yé.
and/he/not/able/to/again/to/go/again/ye
and he wasn't able to leave again.
là a wá yáa nàmeongó t'á lóogdà. nameong sëká
but/he/came/see/a bustard/and/it/passing./bustard/asked/
But he saw a Bustard passing by. Bustard asked
Rabbit what he had done and Rabbit replied that here were these eggs

be kú; b yéelá mé ti yé wèbe, la yé ka töe n wèb yé, are/here/they/said/me/that/he/eat/and/he/not/able/to/eat/ye/
and he had been told to eat them, but he wasn't able to
t'b yók yé n löe ti yé wèb zangá. lâ nameong sé
and/they/take/him/and/bind/that/he/eat/all./and/bustard/sé/
and so they bound him so that he would eat them all. And when Bustard

yú gelá, à yéelá sóambá t'a pídğ bédgo n löe yé,
saw/the eggs/he/said/rabbit/that/he/remove/trap/and/bind/him/
saw the eggs, he told Rabbit to remove the trap and bind him
t'ásóamb pídğ n löe á, lâ a bás 'n kēng 'n ti
and/rabbit/remove/and/bind/him/and/he/leave/and/go/and/go/
and so Rabbit removed it and bound him and left and went and

yeel akrít t'a wà tì bedg yōka mé. lâ akrít sè
tell/hyena/that/he/come/that/trap/caught/me./and/hyena/sé/
told Hyena to come because the trap had caught someone. And when Hyena

wa 'n ta, b pàba nàmeôngó n kú n tì duge là
came/and/arrive/,they/beat/bustard/and/kill/and/go/cook/and/
arrived, they beat Bustard and killed him and cooked him and
b bás n këng koobò. b sé và n kënda, asóamb
they/leave/and/go/farming./they/se/came/to/walking/rabbit/
then they left him and went to do farm work. When they
started walking, Rabbit
táa sórê n yèt ti yé básá bûmb yiri n
arrived/en route/and/say/that/he/left/something/village/and/
said that he had left something at home and
ná n tì rûk là a wá, n lebg n këng akàtr
going/to/go/get/and/he/come/, and/return/and/go/hyena's/
was going to get it and then come, and he went back to Hyena's
yiri n tì yâ t'akatr pûgà là a kâmb gôèe me,
village/and/go/see/that/hyena's/wife/and/his/children/slept/
house and saw that Hyena's wife and children were asleep,
t'a ya'ag nameongo n wâbe la a yâk bim n sôog
and/he/remove/bustard/and/eat/and/he/take/sauce/and/smear
and he took the Bustard and ate it and he took some sauce
and smeared
akâtr pûgà là a kâmb nóeyà la a bás n wa.
hyena's/wife's/and/his/children's/mouths/and/he/leave/and/
Hyena's wife's and his children's mouths and then he left.

'akatr se tâ koob ziîgê, â réega lûngà n wëedë
hyena/se/arrived/farming/place/he/took/drum/and/beat/
When Hyena arrived at the farm, he took the drum and
beat it

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n yetê: "nàmeong bèè yìrí ne rìkò, t'asòamb tàr
and/saying/:bustard/is/village/with/pot/and/rabbit/have/
while saying: "Bustard is at home in a pot," and Rabbit played
lúmbílà n yetê: "kam yòag mà." a dátl n
little drum/and/saying/:hunger/not bother/me/.he/wants/to/
the little drum while saying: "Hunger doesn't bother me!"
He
yèselà me ti yè wàbà nàmeòngá zàngá. koob sè wa n
say/me/that/he/ate/the Bustard/all/.farming/sè/came/and/
meant that he had eaten the whole Bustard. When the farm work was
sà, katrà dà tédà mé ti nàmeòng kétà yìrì
finished/hyena/PAST/believe/me/that/bustard/was at/village/
finished, Hyena thought that the Bustard was at home
ti yè nà n ti wàbe, la a sùur da yàa nóòg wùsgò. là
and/he/going/to/go/eat/and/his/heart/PAST/be/happy/much/..and/
and he was going to eat it, and he was very happy. But
a sè tá yìrì, a míka mé tì bùm ka be duktè ye,
he/sè/arried/village/he/saw/me/that/thing/not/be/the pot/yè/
when he arrived home, he found that there was nothing in the pot,
yàa bím balá n kétè, la a sè yà a pàgá là a
is/sauce/only/that/remains/and/he/sè/saw/his/wife's/and/his/
there was only sauce that was left, and when he saw his wife's and his

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kēmb noeyā se da ya kām, a yeelā mé ti yaà bām
children's/mouths/se/PAST/be/grease/he/said/me/that/is/Them/
children's mouths were greasy, he declared that it was them

n wābé, là a yōka a pá gå ne a kēmb fa ñ pāb
who/ate/and/he/took/His/wife/and/his/children/all/and/beat/
who ate it, and he took his wife and all his children and
beat them

n kù. wakat kānga ñoamba léb n kēngà mé n ti wük gél
and/kill/time/that/rabbit/return/to/go/me/and/go/gather/eggs/
and killed them. Meanwhile, Rabbit went back and collected
the eggs

sè da ket n bàasè.
se/PAST/remain/and/finish
which remained.

... ... ... ... ... ...
là sōamba dika gélà n kōe a pá gå t'á
and/rabbit/took/the eggs/and/give/His/wife/that/she/
And Rabbit took the eggs and gave them to his wife

reeg n dug, là pá gå dug mé n kis sōamba, là sōamba
take/and/cook/and/wife/cooked/me/and/give/rabbit/and/rabbit/
to cook and she cooked them and gave them to Rabbit, but
Rabbit

déega mé n mık t'ā ka sekà yēnna ne a pá gå pūiib ye.
took/me/and/find/that/it/not/suffice/him/and/his/wife's/
found that they did not suffice for him and his wife.

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là a yéélá á págā: "bào tándo ŋ wa" la págā
and/he/said/his/wife/look for/earth/and/come/and/the wife/
And he said to his wife: "Go bring me some earth," and the
wife
tállá tándo ŋ wa. la sòamb déega tándo ŋ bea a rúmdí
took/earth/and/come/and/rabbit/took/earth/and/stick/his/knee/
brought some earth and Rabbit plastered it on his knee
là a yíka mé ŋ kěng wëoogé ŋ kelm: "gél yend kû m
and/he/went out/me/and/go/bush/and/yell/egg/single/killed/my/
and he went out into the bush yelling: "A single egg killed
bá Da-yũugá, là së dik akɔabgá, à ná n yì wána."
father/Da-yũuga/and/sè/took/hundred/it/going/to/be/how/.
father Da-yũuga and as for the one who took a hundred, how
it will be for him!"
àkatí wùmá sòamb góamá là a yéélá á págá: "Pokö, sik
hyena/heard/rabbit's/words/and/he/said/his/wife/Pokö/take
down/
Hyena heard Rabbit's words and said to his wife: "Poko,
n lóbe, sá n ka dë, tónd nà kí fá," là Pok lobà mé.
and/throw out/if/to/not/that/we/will/die/all/and/Pokö/threw
out/me/
throw out the eggs, if not, we will all die," and Poko
threw them out.
là sòamb bóló á págá t'b kěng n tì rïgs gel kës
and/rabbit/called/his/wife/and/they/go/and/go/collect/eggs/
those/
And Rabbit called his wife and they went and collected all
the eggs

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fá, là b váá yírì n púí taába tì sók bá.  
all/and/they/came/village/and/share/each other/and/suffice/  
and they went home and shared them, and it was enough.  

dé dat n yèela mé tì katr tẽedà mé t'á  
that/wants/to/say/me/that/hyena/thinks/me/that/his/  
This means that Hyena thinks that he is  
yam yíida sóambá, là sóamb yám yíida katr.  yàa  
mind/better/rabbit's/but/rabbit's/mind/better/hyena's/is/  
smarter than Rabbit, but Rabbit is smarter than Hyena. It's  
dé yìngá lá sóamb mèan zámbo n tōog katr.  
that/on account of/that/rabbit/made/trickery/and/excelled/  
because of this that Rabbit fooled Hyena.
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