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Aspects of Bambara Syntax

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

by

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1966
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ABSTRACT OF THE DISSERTATION

Aspects of Bambara Syntax

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Professor William E. Welmers, Chairman

This dissertation presents part of a generative grammar of Bambara. Bambara is one of the principle dialects of Mandekan, a major northern Mande language of the Niger-Congo language family. The speakers upon whose language this study is based come principally from the area extending from Bamako to Segou, in Mali, West Africa.

Chapter I discusses the model of transformational-generative grammar used in the study. The syntactic component of this model includes:

1. a set of recursive, context-free branching rules, the terminal units of which are dummy symbols to be rewritten as lexical items;

2. a lexicon, the units of which are represented by syntactic matrices marked with both categorial and inherent features;

3. a set of optional and obligatory simple transformations.
Chapter II compares the basic sentence types which would be included in a taxonomic analysis of Bambara with the output of the set of branching rules in the transformational grammar presented. The comparison shows that some of the deep structural relations between grammatical phenomena which are revealed by the transformational model are obscured by the taxonomic description. The branching rules which illustrate the deep structures of Bambara sentences are presented and justified. A sample lexicon is also included, following a discussion of the inherent and contextual features of nouns and verbs.

Chapters III and IV present Transformational Rules. Shifting Transformations are proposed to handle syntactic phenomena such as the passive construction, certain ambiguities, and permutations. Transformational Rules for the embedding of both appositional and adjectival relative clauses and adjectives are included.

Chapter V deals with Tone Rules. Fifteen ordered rules are proposed which convert highly abstract patterns consisting of high and low tones into a narrow phonetic specification of Bambara sentence pitch patterns. It is shown that the tonal system of Bambara can be classified as a two-tone discrete level system with a downdrift conditioned by low tone. The low tone definite article conditions a step-down phenomenon, and in this
respect Bambara can be called a terrace level language. It is clear that in Bambara the terracing that is found in the surface structure is most satisfactorily analyzed as being the result of a deep structure low tone.
Chapter I
Introduction

The Language

Bambara is the name given to one of the principal dialects of a language called Manding by French scholars and which will be referred to as Mandekan in this study. The Bambara people refer to their speech as bamanakan, bámána being the name for the people, and kán, the word for speech or language. Other principal dialects of Mandekan are referred to as Mandingo, Khasonke, Maninka, Marka, Marka-Dafin, Dyula and Wangara. The location of these dialects is illustrated in the map in Figure 1 which divides the Mandekan language area into nine major dialects. The dialect divisions and the map itself are, with several minor modifications, taken from E. Balenghien's study of the Mandekan dialects (Balenghien, 1966).

The speakers who provided the majority of data upon which this study is based come principally from the area extending from Bamako to Segou. There are some interesting differences which differentiate the Bambara used in urban areas and the Bambara used throughout the rural areas. Some of these differences will be discussed later on. Since the Town Bambara is a simplified form of the rural speech, this study will be primarily concerned
with the more complex form with subsequent illustrations showing what forms have been dropped or modified in the more simple urban and trade dialects.

Mandekan is the major member of the northern group of Mande languages, which also includes languages such as Soninke, Susu, Vai and Kono, according the Welmers' classification (Welmers, 1961). The Mande languages themselves constitute a branch of the Niger-Congo language family following the classification of African languages by Greenberg (Greenberg 1962).

Phonological transcription

This study is concerned with the grammar rather than the phonology of Bambara. The transcription follows quite closely that recommended by the Manding commission at the UNESCO conference on alphabetisation in Bamako, March 1-5, 1966. In addition to the symbols listed below, the commission recommended that, in most cases, morphophonemic alternants should be signalled by the orthography. The latter recommendation has been bypassed here to facilitate the following of the grammatical rules. For example, /l/ and /r/ when following a nasalized vowel have the morphophonemic alternant /n/. Changes such as this will not be illustrated in the examples used to demonstrate grammatical phenomena. The UNESCO orthography is given below along with the modifications used in this study.
Consonants

p  b  f  m
   t  d  s  z  n
  ty  dy  sy  ny
  k  g  kh  j
   h

Liquids

l  r

Semi-vowels

y  w

Nasal compounds

initial position: mp  nt  ns  nk
medial position: mb  nd  nz  ng

Palatalized consonants

py  by  fy  my

Notes

z is only phonemic in those dialects where the nasal element of the compound /ns/ has been lost after the voicing of the following consonant, e.g.
nsaban \(\rightarrow\) nzaban \(\rightarrow\) zaban 'wild fruit'
sy is only phonemic in those dialects where /s/ is palatalized before a high front vowel after which the latter is lost, e.g.
sisə → syisə → syə 'chicken'

kh is only phonemic in dialect area II, i.e. Khasonke.
The labial series of palatalized consonants occurs only in Bambara.

Vowels

<table>
<thead>
<tr>
<th>non-nasal</th>
<th>nasal</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>in</td>
</tr>
<tr>
<td>e</td>
<td>en</td>
</tr>
<tr>
<td>ɛ</td>
<td>ɛn</td>
</tr>
<tr>
<td>a</td>
<td>an</td>
</tr>
<tr>
<td>o</td>
<td>oŋ</td>
</tr>
<tr>
<td>u</td>
<td>un</td>
</tr>
</tbody>
</table>

In the UNESCO orthography, /e/ is represented by /é/ and /ɛ/ is represented by /e/. Likewise, /o/ is represented by /ó/ and /ɔ/ is represented by /o/.

Tone

In the UNESCO orthography, low tone is to be marked by a grave accent over the first vowel of every low tone word. High tone words will not be marked. It is to be noted that only one tone mark is required per word since, as originally
pointed out by Welmers, the scope of phonemic tone is not the syllable, but the word. In this study, only high tone words will be marked with an acute accent over the first vowel, except in the cases of the tonal manifestation of the determiners in which case the unknown determiner will be represented by a high tone acute accent and the known determiner will be represented by a low tone grave accent, e.g.

\[
\begin{align*}
\text{dy\text{á}ri} & \quad \text{muso} \\
\text{tree} & \quad \text{woman}
\end{align*}
\]

No system was proposed by the UNESCO commission to account for the above determiners.

The Model

The model on which this study is based is drawn primarily from the discussions of generative theory in Katz and Postal, *An Integrated Theory of Linguistic Descriptions*, (1964), and Chomsky, *Aspects of the Theory of Syntax* (1965). A generative grammar, as discussed in the above works, consists of three components: semantic, syntactic and phonological. The syntactic component which forms the base of the grammar is a set of rules which characterizes the speaker's ability to
a) assign structure to
and
b) generate
the infinite set of grammatical sentences of a language.
The semantic and phonological components operate on the output of the syntactic component; the former, interpreting the meaning of the deep structure of sentences; the latter, converting the abstract phonological notation into acoustic or articulatory phonetic instructions. The eventual output of the phonological component is the phonetic representation of the sentence. In this study the phonological component will be limited to a set of rules which describe the pitch patterns of Bambara sentences. The form of the semantic component will not be discussed; however, the clarification by Katz and Postal of the manner in which the semantic component operates has had a considerable effect on the form of the syntactic component and this will be developed to some extent below.

The components and subcomponents of a generative grammar as discussed below can be illustrated by the flow chart in Figure 2. Another conception of the generative grammar flow chart can be found in Katz and Postal (161, 1964).

The Branching Rules

The branching or phrase structure rules as originally put forth by Chomsky in *Syntactic Structures* have been
Meaning of $\text{S}$

Semantic Component

Branching Rules

preterminal string

lexical entry assignment

terminal string

Lexicon

Transformational Component

Derived P-marker

Surface Structure of $\text{S}$

Phonological Component

Phonetic representation of $\text{S}$
revised in a number of important respects by Chomsky and his colleagues. One of the major such revisions is Chomsky's suggestion in Aspects that the branching rules be context free. That is, the rule XAY is rewritten XBY is allowable in the branching rules only if X and Y are null.

One immediately apparent advantage of context-free over context-restricted branching rules is that the function of the branching rules as opposed to the transformational rules becomes more precise. When unlimited context-restrictions are allowed in the branching rules, there are numerous cases in which grammatical phenomena could be treated either as a context-restricted rewrite in the branching rules or as a transformation.

Another important revision is that recursive grammatical operations such as the embedding and conjoining of sentences are now introduced in the branching rules by allowing the symbol # S # to reoccur in a line of derivation. The use of # S # is in many respects similar to the use in Katz and Postal of the symbol md (matrix dummy). It is to be noted, however, that by using # S #, all transformations are reduced to operations on single phrase markers. In addition, when # S # occurs in the branching rules, the embedding and conjoining transformations are obligatory rather than optional as in the early transformational models. Thus, instead of having two major types of transformations: simple, operating on single P-markers;
and generalized, operating on two, P-markers, there is now only one basic type of transformation. A P-marker may however be defined as simple or complex (generalized) depending on whether or not it contains an embedded \# S \# in its derivation.

The necessity for the selection in the branching rules of what were previously treated as optional generalized transformations is discussed at some length in Katz and Postal. One of the primary reasons behind this modification is provided by the argument that transformational rules cannot effect the meaning of the sentence. The semantic projection rules operate only on the deep phrase marker of the sentence (see flow chart). The role of the transformations becomes, through this strong constraint, much more clearly defined. They are optional or obligatory but their operation is constrained only to information supplied in the P-marker, thus not effecting the meaning of the deep structure of the sentence in any manner. Optional transformation can be interpreted in fact as a formalization of grammatical paraphrasing.

Since the semantic projection rules must operate on the deep structure of the sentence, it is obvious that the deep structure must contain all information necessary for an accurate semantic interpretation. One of the consequences of this requirement is that a certain number of dummy symbols such as Q(uestion) and Neg(ative) are
introduced by the branching rules. It has however been well demonstrated by Klima (1964) and Katz and Postal (1964) that a number of these dummy symbols also have strong independent grammatical justification.

The choice of dummy symbols and all other symbols used in this study has been motivated by the assumption that there is a set of substantive universals to be used in the description of all languages. Underlying this assumption is the belief that one of the major goals of linguistic investigation is the formal establishment of these universals. It thus becomes important to show in what respect languages are the same in addition to illustrating their individual differences. In keeping with this commitment to linguistic investigation, it must be noted that the addition of a new symbol is an extremely strong claim, since such a symbol must itself be added to the set of substantive universals.

The branching rules generate a partial P-marker, the terminal units of which are minimal syntactic categories. A minimal syntactic category is generally one which is no longer subject to linear expansion, such as, for example, N(oun), V(erb), Post(position), etc.

Relational Definitions

With the information supplied by the branching rules relational terms, such as subject, noun subject, object, main verb, etc. may all be defined as illustrated by
Chomsky in Aspects (70-1, 1965). Rather than such definitions being included in the description of individual languages, it is here claimed that such definitions are part of the metatheory, that is, for example, that all terms such as subject and object are defined for all languages in the same manner. One is free to use the relational terms after the operation of the branching rules, since these terms are universally defined by the metatheory and their referents are uniquely recoverable through the branching rules.

**Lexical Attachment**

This study uses the alternative to lexical assignment proposed by Chomsky in Aspects (122-3, 1965). Minimal syntactic categories will be rewritten as the dummy symbol % which will represent the instruction, 'select lexical entry Q where Q is a set of three matrices, semantic, syntactic and phonological, and in which the syntactic matrix contains the feature [+X] where X is the minimal syntactic category which immediately dominates %'. For example, there will be included in the branching rules, a rule of the type

$$N \rightarrow \%$$

the lexical substitution transformation will substitute a lexical item which contains a syntactic matrix marked with the feature [+N].
The syntactic matrix will contain features that may be said to be inherent to the class as well as features which are based on deep structure contexts. The latter will be referred to as contextual features. For example, the feature [+ count] is a feature inherent to nouns, whereas the feature [+ NP ___], i.e. transitive, is a feature based on the syntactic environment in which a limited set of Bambara verbs can occur. When a lexical item is attached to the minimal category, there must be a matching of the contextual features in the complex symbol with the context in which the minimal category occurs in the P-marker. In this study, all features assigned to noun syntactic categories are assigned matrices which contain contextual features. It is thus obvious that the algorithm for lexical assignment must indicate that nouns are to be selected first.

Although it would be preferable to conceive of the lexicon as simply an unordered set of all morphemes each of which is represented by three matrices of features, there are a number of unresolved problems which complicate such a conception. It appears, for example, necessary in English to have a set of word formation rules which will adequately assign structure to compounds such as 'telephone', 'telegraph', etc. for the operation of the intonation contour assignment rules as discussed in Chomsky, Halle and Lukoff (1956). There are, in addition, in Bambara as well
as English, numerous rules which refer to the shifting of inherent features, such as, for example, the rules by which abstract nouns are derived from concrete nouns. These rules certainly do not involve an embedded sentence and may thus be discounted as transformations in the syntactic sense, e.g.

\[ [+N, +\text{concrete}] \Rightarrow [+N, -\text{concrete}] + -ya \]

\[ \text{fa} \Rightarrow \text{fa} -va \]

\text{father} \Rightarrow \text{father} -\text{hood} \]

Derivations of this sort could be included in a special component appended to the lexicon. Since the formal aspects of the relation of these rules to other types of transformations has not been resolved and since these types of derivations are not one of the aspects of this study, alternative treatments of this problem will not be discussed.

The Transformation Rules

The branching diagram with the addition of the lexical items constitutes the deep structure or underlying P(phrase)-marker of the sentence. The transformational rules operate on the underlying P-markers, producing derived P-markers upon which transformations may also operate. There are two basic transformational operations:
addition and deletion. Operations such as permutation and replacement can be considered as sequences of the two basic operations. As mentioned above, transformations may be either optional or obligatory, but in neither case do they effect the meaning of the sentence. The role of optional transformations is extremely important in the distinction made by Chomsky between competence and performance (Chomsky, 10-12, 1965). Competence may be roughly defined as that which the grammar allows a speaker to do. Performance, on the other hand, is related to the speaker's preference for applying or not applying an optional rule. In some cases, the transformations are actually bracketed, i.e., the choice of a transformation is obligatory, but there is an either/or choice of specific transformations within the brackets. The rules themselves are part of the speaker's competence, but the selection of a rule in a situation where there is a choice is part of the speaker's performance. For example, both adjunctive objectives and relative clauses are derived from the same embedded sentence. The transformations which apply to adjunctive adjectives and relative clauses are bracketed together. If the P-marker satisfies the structural descriptions for both the adjectival and relative clause transformations, the choice of one transformation over the other is at the level of performance. The distinction, for example, between
concerns both competence and performance. The rules for their formation are at the level of competence, but since the sentences are paraphrases of each other, the selection of rule is part of performance.

An important point developed in Katz and Postal is that, since no transformation can effect the meaning of the sentence, all items deleted by transformation must be uniquely recoverable. Given the derived P-marker and the transformational rule, one must be able to backtrack, replacing the deleted item. The implications of this requirement are far reaching. For example, Bambara has a passive construction in which there is an expressed agent, e.g.

\[
\text{bára } \text{ké} \text{ -ra } \text{tye } \text{ -fě}
\]

work the do C man the by

'The work was done by the man'
Under certain conditions, the agent may be deleted, producing,

2) \[\text{bára } \kê \text{-ra}\]
work the do C
'The work was done'

Sentence 2) may not however be derived by the deletion of the agent \[\text{tye } \fɛ\] in sentence 1) since there is no rule which specifically allows the recovery of \[\text{tye}\]. The understood deleted agent in sentence 2) is actually \[\text{məgə} \text{'a person'}. In this sense, sentence 2) can be considered as a grammatical paraphrase of the sentence

3) \[\text{bára } \kê \text{-ra } \text{məgə } \fɛ\]
work the do C person a by
'The work was done by someone'

In the treatment recommended by Katz and Postal, only forms marked with the feature [+Pro] are deletable. \[\text{məgə}\] would thus be marked with the features [+human, +Pro] among others. Given a verb which requires a deep structure subject marked with the feature [+human], one could then uniquely recover \[\text{məgə}\] after the operation of the deletion transformation. Similar treatments would be allowed for \[\fɛn \text{'thing'}\] which would be marked with the features [+concrete, +Pro] and \[\kə \text{'abstract thing'}\], marked with the features, [-concrete, +Pro]. It can be argued
however that any generic noun is a cover symbol for a set of items, that is, a Pro-form. For example, 'tree' could be considered as a Pro-form for the set, 'birch, fir, pine, etc.' It would not be out of the question to expect to find in some language, or even in a specialized dialect of English for that matter, verbs which only occur with 'tree' or one of the subsets of 'tree' as objects. If there were an object deletion transformation, and the recovery procedure could only replace 'something' in the deleted object slot, the procedure would not be an adequate reflection of a native speaker's ability. Rather than end up marking all generic words with the feature [+ Pro], recoverability can be just as well guaranteed by eliminating the feature [- + Pro] from the noun matrix, but having the specialized object features included in the matrix for the verb.

Chomsky states in Aspects (1965) that deletion transformations can only operate on one of the three following elements: a dummy element; a formative explicitly stated in the structural description; the designated representative of a category.

In the case of the deletion of passive agents or objects, the representative of a category that is deleted would be specified by the verbal matrix. A convention would be necessary requiring the identity rather than the non-distinctness of the features involved, since a complex
symbol marked with the feature [+ concrete] is non-distinguishable from one marked [+ concrete, + human]. Without the identity convention, one could just as well recover 'thing' as the object of a verb which in reality calls for a noun marked with the feature [+ human].

Although the resolution of such theoretical issues is of great interest, it is well beyond the scope of the work at hand. The units established in the branching rules which follow are in many ways motivated by certain theoretical commitments, such as the recoverability of deleted items, even though the formalization of these issues is not yet complete.

Summary

The model of the syntactic component used for the analysis which follows consists of:

1. a set of recursive, context-free branching rules, the terminal units of which are the dummy symbols, %, which indicate that the immediately dominating item is to be rewritten as a lexical item.
2. a lexicon, the units of which are, in theory, represented by three matrices of features. The only matrix that will be the concern of this study is the syntactic matrix which will be marked with both categorial and inherent features.
3. a set of optional and obligatory simple (one P-marker) transformations.
4. a set of P(honological) rules which convert the abstract phonological notation of the lexicon to a set of rules for converting the tonal phonemes into sentence pitch patterns.
Chapter II
The Branching Rules

This chapter has two major sections. The first is a listing of basic sentence types which might be found in a hypothetical taxonomic analysis of Bambara. The following section is a discussion of the set of branching rules for Bambara sentences and a comparison of the output of these rules with the taxonomic classification. The taxonomic classification which follows is not presented as a straw man since it follows very closely that which is either implicit or explicit in the analyses of Rowlands (1959), Molin (1954), Balenghien (1965) and Houis (1966).

Basic Sentences

The above analyses admit the existence of at least two sentence types: basic and complex. A basic sentence may be roughly defined as one in which none of the units with which the sentence is composed are extraneous to the sentence's grammaticality. Such classifications are based on the surface structure of sentences that units of which may however be hierarchized into larger units such as N(oun) P(hrase), V(erb) P(hrase), etc. The rough equivalent in a generative grammar to a basic sentence is the pre-terminal string represented in terms of minimal syntactic categories and which includes only the object noun phrase and the complement noun phrase as the optional
choices in its derivation.

Since the basic noun phrase can be consistently represented as N(oun) followed by a tonal article, the following discussion will only use the generalized form N(oun) P(hrase) while examining the different types of predications.

I. Non-verbal Predications

A. Noun Phrase do

Ex: a) muso ∩ do
   woman the it is
   'It's a woman'

b) tiven ∩ do
   truth the it is
   'It's the truth'

c) a do
   he it is
   'It's him'

B. Noun Phrase ye Noun Phrase ye

Ex: a) tye ∩ ye móri ∩ ye
    man the is teacher the as
    'The man is the teacher'

b) Nin ye daga ∩ ye
    This is pot the as
    'This is the pot'
c) a yé dugu tigi 'vé
he is village chief a as
'He is a village chief'

C. Noun Phrase bé Noun Phrase post-position

In the southern and southwestern dialects of Mandekan, where pattern B has the form

Noun Phrase bé Noun Phrase yé

patterns B and C could very well be combined. All of the taxonomic analyses of Bambara do not make any structural differentiation between any of the forms listed below, since, on the surface, they all have the same structure. As will be pointed out later, there are good reasons for distinguishing a postpositional phrase which operates as a complement and those which operate as adverbials.

Ex: 1. dyege bé dyi kono
   fish the is water the in
   'The fish is in the water'

   2. tye bé só lá
   man the is house the at
   'The man is at the house'
3. musó \ bě́ síra \ fě́
   woman a is path the directed
   'The woman is on the road' (en route)
   or
   'The woman wants the road'
   or
   'The road has the woman'

4. fě́n \ bě́ kɔ́ \ fě́
   thing the is back the directed
   'The thing is at the back'

5. wári \ bě́ tye \ bólo
   money the is man the hand
   'The man has money'

6. fini \ bě́ muso \ kun
   cloth the is woman the head
   'The cloth is on the woman' (The woman has cloth)

7. tye \ bě́ muso \ fě́
   man the is woman the directed
   'The man wants a woman'
   or
   'A woman has the man'

There are a number of possible treatments for the examples 3, 4 and 7, all of which contain the morpheme fě́. In order to resolve the apparent ambiguities involved in
the use of fe, one might wish to analyse fe as being several homonymous morphemes, such that fe meaning 'want' and fe meaning 'have' would be listed separately in the lexicon. This analysis does not respond to the native speaker's intuition, however, since without fail, all the informants feel that it is the same word. Resolving the semantics of fe is helpful in the grammatical analysis. It seems that fe is a post-position denoting a neutral vector, i.e. it is used to indicate direction in space or time without specific reference whether it is towards or from a particular point. With this analysis, it can be demonstrated that the ambiguity of the above examples lies in the translation and not in the language itself. The fact that example 7 has two readings in English is not an illustration of ambiguity, but rather of imprecision. More will be said about this particular morpheme in the discussion of the branching rules below.

8. a bé bára \ lá
   he is work the at
   'He is working'

9. a bé dyíri \ tigé \ lá
   he is tree the cutting at
   'He is cutting the tree'

10. a bé tága (-li) \ kan (parentheses = optional)
    he is go (ing) the on
    'He is going'
There are two additional forms which can be treated as paraphrases of 10, e.g.

10a) a bé kan ka dyíri \ tigë
    he is on to tree the cut
    'He is cutting a tree'

10b) a bé ka dyíri \ tigë
    he is to tree the cut
    'He is cutting the tree'

It is not clear how the relationship between these three patterns could be formally stated in a taxonomic description.

D. Noun Phrase té/bé

1. héré \ bé
   peace the is
   'There is peace'

2. tóro \ té
   misfortune the isn't
   'There is no misfortune'

II Verbal Predications

A. Noun Phrase Asp Noun Phrase Verb

Ex: 1. a ye dyíri \ tigë
    he C tree the cut (C = completive)
    'He cut the tree'
2. a mà dyíri \tigɛ  
   he C tree the cut  
   neg  
   'he didn't cut the tree'

3. a bê dyíri \tigɛ  
   he -C tree the cut (-C = non-completive)  
   'He cuts trees'

4. a té dyíri \tigɛ  
   he -C tree the cut  
   neg  
   'He doesn't cut trees'

5. a bê-na dyíri \tigɛ  
   he will tree the cut  
   'He will cut the tree'

6. a té-na dyíri \tigɛ  
   he won't tree the cut  
   'He won't cut the tree'

It appears that the na in the aspect marker in examples 5 and 6 is derived historically from the verb 'come' na. It does not appear feasible to analyse this aspect as the verb na plus another verb phrase for two reasons. Firstly, when na is used as an aspect marker, the bé that precedes it is optionally deletable. For example 5 becomes optionally

5a. a na dyíri \tigɛ  
   he will tree the cut
This is never the case when na is operating as a verb. In the second place, speakers seem to recognize sentence 5 as having two meanings, i.e. it is ambiguous. The second meaning is 'He is coming to cut the tree' in which na is used as a verb and where dyiri tige is conjoined to na.

B. Noun Phrase Asp Verb

1. dyiri \ be\ tige
   tree the -C cut
   'The tree is being cut'

2. dyiri \ ma\ tige
   tree the C cut neg
   'The tree hasn't been cut'

3. tye \ ma\ na
   man the C come neg
   'The man didn't come'

4. muso \ be-na \ taga
   woman the will go
   'The woman will go'

C. Noun Phrase Verb - Suffix

1. tye \ sigi \- ra
   man the sat C
   'The man sat down'
There seems to be no disagreement in all the analyses of the various dialects of Mandekan concerning the fact that verbs plus the suffix -ra are part of the verbal paradigm. There are some differences concerning the treatment of verbs with the suffixes -len and tɔ. It is not clear from looking at the surface structure whether these forms are part of the verbal paradigm, or whether they are derived forms operating as nominal modifiers. The question is soon resolved when the sentences 2 and 3 are embedded, e.g.

2a) a be a fe tyɛ \ sigi-lɛn ka kɛ

he is it directed man the sit-ed to do

'He wants the man to be seated'

3a) a be a fe tyɛ \ sigi-tɔ ka kɛ

he is it directed man the sit-ing to do

'He wants the man to be sitting down'

In 2a) and 3a) it is obvious that both of the suffixed verbs are part of the noun phrase, preceding the predicate ka kɛ. Thus, although there are certain overt similarities between the above three examples, they will be treated
quite differently in the discussion of the branching rules.

In the Maninka of Kita and in Khasoneke dialects, the
completive intransitive suffix is _ta, corresponding to
Bambara _ra. This dialectal difference is an example of a
more general rule in which intervocalic /t/ becomes /r/ in
the Eastern and Southern dialects.

It is interesting to point out at this point that in
many instances a taxonomic description finds it awkward to
describe the relations between certain types of grammati-
cal phenomena. In a slot analysis of Bambara syntax, one
would be required to have a position for an aspect marker
preceding the verb, as well as a position for an aspect
marker suffix attached to the verb. The latter would only
be filled by the affirmative, completive suffix _ra. It
would be difficult to show that the negative corresponding
to the suffix _ra is part of the aspect marker paradigm
which precedes the verb. In a transformational analysis,
the aspect marker is simply permuted to a suffix position
when marked with the features +completive, -negative,
so that in the deep structure there is only one position
for aspect markers.

It may also be noted at this point that there is no
way of formalizing the relationship that exists between the
sentences,
II. A. 2. a má dyíri \ tigé
he C tree the cut
\neg
'he didn't cut the tree'

and

II. B. 2. dyíri \ má tigé
tree the C cut
\neg
'The tree hasn't been cut'

In the taxonomic analyses, II B 2 is classified as an intransitive sentence, the same as
tyé \ tága \ -ra
man the go C
'The man went'

which does not seem to illustrate effectively the difference in relation between the subject dyíri and the verb tigé in II B 2 as opposed to the subject tyé and the verb tága in the above sentence. The transformational analyses of these sentences is discussed in some detail in Chapter III.

D. Noun Phrase
\{ka' \\[ \\{man \} \ \ V \ [+ \ adj] \}

There is ample evidence throughout the Mande languages and in the Niger-Congo languages in general that predicate adjectives are actually a subset of verb. This point will be developed further in the discussion of the branching rules.
Ex: 1. muso \ ká\ nyi
   woman the is good
   'The woman is good'

2. muso \ máń\ nyi
   woman the isn't good
   'The woman isn't good'

3. dyí \ ká\ súma
   water the is cool
   'The water is cool'

4. bára \ ká\ gb\ l\ n
   work the is difficult
   'The work is difficult'

5. ntori \ máń\ téri
   frog the isn't quick
   'The frog isn't quick'

Summary

The taxonomic inventory given above of basic sentence
types includes two major sentence types, verbal and non-
verbal predications. The non-verbal sentence types are
further broken down into four sub-sets:

A Noun Phrase \{té\}
   \{do\}

B Noun Phrase \{té\} Noun Phrase ye
C. Noun Phrase \{ bé \te \} Noun Phrase post-position

D. Noun Phrase \{ bé \te \}

The verbal predications are likewise subdivided into four subsets:

A. Noun Phrase Asp Noun Phrase Verb
B. Noun Phrase Asp Verb
C. Noun Phrase Verb -Suffix
D. Noun Phrase \{ ka \man \} Verb [+ Adj]

As will be shown below, this brief inventory of basic sentence types is considerably greater than the output of the branching rules which illustrate the deep structural relations between the above basic sentence types.

Bambara Branching Rules

\[
\begin{align*}
1. \# S \# &\rightarrow \\
&\{ \begin{align*}
C_1 \\
C_2 \\
C_3 \\
\end{align*} \} \\
&\{ NP \overset{\cdot}{\sim} VP \overset{( SA )}{\cdot} \}
\end{align*}
\]

A sentence (\#S\#) is rewritten (\rightarrow) as an either/or choice (represented by braces) of a sentence followed by a conjoined (C_1 or C_2) sentence, or as a noun phrase (NP).
followed by a verb phrase (VP) which is in turn followed by an optional sentence adverb (SA).

\[ C_1 \text{ and } C_2 \]

The symbol \( C_1 \) serves as a marker for sentences conjoined in a manner similar to the use of 'and' conjoined nouns in English. \( C_2 \) corresponds to some of the uses of 'and' conjoined verbs. \( C_3 \) corresponds to 'or' conjoined sentences. Since these transformations will not be discussed in the chapters which follow, examples of the various types of conjoined sentences are given below.

a) \# muso \( \backslash v \) é malo \( \backslash s a n \) \# \( C_1 \) \# muso \( \backslash v \) é ny\( \delta \) \( \backslash s a n \) \#

woman the C rice buy woman C millet the buy

becomes either

b) muso \( \backslash v \) é malo \( \backslash s a n \) ani ny\( \delta \)

woman the C rice the buy and millet

'The woman bought rice and millet'

or

c) muso \( \backslash v \) é malo \( \backslash a n i \) ny\( \delta \) \( \backslash s a n \)

woman the C rice the and millet the buy

'The woman bought rice and millet'

In \( C_1 \) conjoining the order of the conjoined elements is not significant. With \( C_2 \) conjoining, the order is significant, denoting a series of actions in a particular order, e.g.

d) muso \( \backslash t \) ága -ra súgu \( \backslash l \) á ka malo \( \backslash s a n \)

woman the go C market the to and rice the buy

'The woman went to market and bought rice'
e) \textit{muso \textasciitilde ye \textasciitilde malo \textasciitilde san ka ny\textasciitilde san}  
woman the C rice buy and millet the buy  
'The woman bought rice and (then) bought millet'  
The structural description for $C_2$ conjoining requires that  
the subjects of both conjoined sentences are the same.  
The transformation deletes the second subject noun phrase  
and replaces the aspect marker with \textit{ka}. There is no con­  
joining of logically related sentences as in English, e.g.  
'A bomb exploded and the war began'  
In Bambara this would be expressed by a series of two  
independent sentences. Sentences conjoined by $C_3$ permit  
this phenomena, e.g.  

f) \textit{ty\textasciitilde don -ra wala muso \textasciitilde bo -ra}  
man the enter C or woman the leave C  
'The man entered or the woman left'  
Other examples of $C_3$ conjoining are as follows:  
g) \textit{\#nsonsan \textasciitilde ye a ke \# C_3 \# mali \textasciitilde ye a ke \#}  
rabbit the C it do hippo the C it do  
becomes either  
h) \textit{\#nsonsan \textasciitilde ye a ke wala mali}  
rabbit the C it do or hippo  
'The rabbit did it or the hippo'  
or  
i) \textit{\#nsonsan \textasciitilde wala mali \textasciitilde ye a ke}  
rabbit the or hippo the C it do  
'The rabbit or the hippo did it'
In terms of performance for $C_3$ conjoining, most speakers prefer form h). However, when the speaker is conscious of the ambiguity that may arise from this type of construction he will switch to form i). For example, the sentence

j) $\text{tye ye muso ye wala den misen}$
man the C woman the see or child
'The man saw the woman or the child'
is ambiguous since the conjoined noun den misen 'child' may be either the subject or the object of the verb yé 'see'. The ambiguity is circumvented in the following forms k) and l).

k) $\text{tye wala den misen ye muso ye}$
man the or child the C woman the see
'The man or the child saw the woman'

l) $\text{tye yé muso wala den misen yé}$
man the C woman the or child the see
'The man saw the woman or the child'

In this analysis, the base for yes-no questions is a $C_3$ conjoined sentence in which there is identity between all the elements in the conjoined sentences except for the opposition plus vs minus negative in the aspect markers, and the presence of the dummy symbol Q dominated by sentence adverb, e.g.

m) $\#\text{nsonsan ye a ké Q # C}_3\#\text{nsonsan má a ké #}$
rabbit the C it do rabbit the C it do
neg
The transformation applying to m) erases all the identical elements and the aspect marker in the second sentence and either rewrites $Q + C_3$ as $wa$ or as $?$ which serves as a marker for question intonation, or rewrites $Q + C_3$ as sentence initial $yala$, e.g.

n) $nsonsan' ye' a ke' wa$
   rabbit the C it do Q
   'Did the rabbit do it?'

o) $nsonsan' ye' a ke' ?$
   rabbit the C it do ?
   'The rabbit did it?'

p) $yala nsonsan' ye' a ke'$
   Q rabbit C it do
   'Did the rabbit do it'

\[
NP \rightarrow \left\{ \begin{array}{c}
\left\{ \begin{array}{c}
\{ \text{ProN} \} \\
\{ N \wedge D \}
\end{array} \right\} \\
\{ \#VS\}
\end{array} \right\} \\
\{ \#S \}
\]

A noun phrase may be rewritten as a pronoun (ProN) or as a noun (N) plus a determiner (D), both of which are followed by a number marker. A noun phrase may also be rewritten as an embedded sentence from which certain types of nominalizations are derived. All of the above possibilities may be followed by an optional embedded sentence.
from which appositional relative clauses are derived. The final possibility for the noun phrase is to be rewritten as a dummy symbol for a question (Q).

The embedded sentence dominated by the noun phrase is that from which nominalizations such as,

\[
\text{ka súgu \'{l}á tágå dí-ya-ra dén mis\'{e}n \'{y}é}
\]

# S #
to market the to go please C child the as
'Going to the market pleased the child'

and

\[
\text{Sédù ka dyíri \'{t}igé o mán nyí}
\]

# S #
Seydou to tree the cut, that isn't good

'For Seydou to cut a tree is not good'

are derived. In the above example, the nominal Sédù ka dyíri \'{t}igé has been front shifted and the pronoun o has replaced it in the noun phrase position. The front shifting of nominal of this type is not obligatory.

This embedded sentence also serves as the source for objects of quotes verbs, such as \(\text{fe}~'\text{say}'\) and \(\text{mírî}'\text{'think'}\), as well as the source for certain types of 'subjunctive' complements, e.g.

\[
a\ ye~a~f\,\,c~ko~a~b\,\,é-n\,\,a~t\,\,ágå
\]

he C it say that he will go

'He said that he will go'
b) a bé míri ko a bé-na tága
he -C think that he will go
'He is thinking that he will go'

In example a), fo is a transitive verb, requiring a noun phrase object. When the embedded sentence is obligatorily rear shifted, the object position is filled by the pronoun a. In example b), míri is an intransitive verb which takes a complement noun phrase with the post-position lá, e.g.

c) a bé míri a lá
he -C think it on
'He is thinking about it'

When the object of the post-position is rewritten as an embedded sentence as in example b), the post-positional phrase may be optionally deleted. If the post-positional phrase is not deleted, the embedded sentence is rear shifted and the noun phrase position is filled by the pronoun a, e.g.

d) a bé míri a lá ko a bé-na tága
he -C think it on that he will go
'He is thinking that he will go'

Since the deletion of the post-positional phrase is optional it is understood that example b) is a paraphrase of example d).

e) a bé-na ké a fɛ mɛɛ \ ka hɔrɔn-ya
he will do it directed people the to be free
'He will want people to be free'
In example e), *mogo \( \text{ka} \) hóron-ya* is derived from the embedded sentence which is the deep structure object of the post-position \( \text{fe} \). The underlying structure looks something like the following:

\[
\begin{align*}
\text{a bé-na ké} & \quad \# S \quad \# \text{fe} \\
\text{mogo \ Asp hóron-ya}
\end{align*}
\]

The embedded sentence is obligatorily shifted to the rear of the sentence and the noun phrase slot is filled by the pronoun \( \text{a} \). When the object of the post-position \( \text{fe} \) is the same as the subject, the former is deleted, e.g.

a) \( \text{a bé-na ké a fe ka tága} \)

he will be it directed to go

'He will want to go'

The above sentence is derived from an underlying structure which can be represented by the following diagram.

b) \( \text{a bé-na ké} \quad \# S \quad \# \text{fe} \)

he will be directed

\[
\begin{align*}
\text{a bé-na tága} \\
\text{he will go}
\end{align*}
\]

The matching subject of the embedded sentence in b) is erased and the aspect marker is replaced by \( \text{ka} \) after the permutation of the embedded sentence to a position.
following the post-position fe.

It is to be noted that these nominals do not occur with the number marker and do not occur with any of the determiners.

( # S # )

The optional embedded sentence from which appositional relative clauses are derived can occur either with the pronoun, the noun plus determiner or the nominal derived from an embedded sentence. Appositional relative clauses, similar to non-restrictive relative clauses in English, are discussed in some detail in Chapter IV. Some examples are as follows:

a) né, mín yé bára'ké kó sèbe sègen ra
   I, wh-C work the do well, tire C
   'I who have worked well am tired'

b) ka súgu 'lá tága, mín ká gbélan, dí-va-ra né yé
   to market the to go, wh- is hard, please C me as
   'To go to the market, which is difficult, pleased me'

The dummy symbol for question which is dominated immediately by noun phrase is rewritten by transformation as mun, e.g.

a) mun ké ra
   What be C
   'What happened'
b) ɪ yé mun ye
you C what see
'What did you see'

c) ɪ bé mun bára ké
you -C what work do
'What work do you do'

In example c), mun is operating as the first element in a genitive compound.

3. Num $\rightarrow \{ \text{Sg} \}
\{ \text{Pl} \}$

Number is rewritten as singular (Sg) or plural (PL).

The semantic contrast in Bambara seems to be in most instances marked plural as opposed to unmarked. The unmarked noun phrase is not necessarily singular, but can also be interpreted as generic. The lexical representatives of these categories are $\emptyset$ and kélé $\text{'one'}$ for singular. The symbol $\emptyset$ stands for a morpheme which has no phonological matrix. The plural marker is to be rewritten lexically as either the plural morpheme $u$ or the numerals 'two' to infinity. It is to be noted that the plural marker does not occur with the plural numerals, e.g.

\[
\text{tv} \varepsilon \ 'fìlà \ bè \ yàn} \\
\text{man the two -C here} \\
\text{'The two men are here'}
\]
The pronoun is to be rewritten as a lexical item. The syntactic matrices for pronouns will contain the categorical feature plus/minus \[^{---\text{Pl}}\] and the inherent feature plus/minus \[^{---1\text{st}\text{person}}\]. The feature \[^{---1\text{st}\text{person}}\] refers only to second person pronouns. The third person pronouns, a 'he, she, it' and u 'they', are introduced by transformation, replacing the noun and the determiner. The four possibilities generated by the intersections of the two features are as follows:

<table>
<thead>
<tr>
<th>1st person</th>
<th>+</th>
<th>-</th>
<th>-</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
\text{\text{án}} & \quad \text{u} \\
\text{á} & \quad \text{u} \\
\text{é} & \\
\text{né} & \\
\text{'we'} & \\
\text{'you' pl.} & \\
\text{'you' I} & \\
\end{align*}
\]

The pronominal forms \text{né} 'I', \text{é} 'you' sg., \text{á} u 'we', \text{á} u 'you' pl. are what might be called the long or emphatic forms. In normal conversation, these forms are usually reduced in the following manner:
né → N (homorganic nasal)
è → ē
an u → àN (a plus homorganic nasal)
à u → à

It is interesting to note at this point that throughout the Mande languages, the third person plural pronoun is identical to the morpheme used to mark the plural. This phenomenon can be accounted for by writing the pronominalization transformation so that the noun and the determiner are erased, leaving only the plural marker, e.g. in the sentence

n yè muso ' u yè
I C woman the Pl see
'I saw the women'

the object noun muso plus the article are deleted by the pronominalization transformation, producing,

n yè u yè
I C Pl see
'I saw them'

7. N → %

The noun is also to be rewritten as a lexical item. The features that apply to nominal classification will be discussed later in this chapter.
A determiner is rewritten as an optional adjective (Adj), followed by an optional choice of either an embedded sentence, or a dummy symbol for a question (Q), and finally an article (Art).

The optional embedded sentence which can be chosen as a rewrite of the determiner is that from which nominal modifiers such as adjunctive relative clauses and adjectives are derived. Some of the more interesting features that distinguish the various types of nominal modifiers are discussed in Chapter IV. A few examples of nominal modifiers derived from this embedded sentence are as follows:

a) \textit{nê yê tye min yê, o bê yan}
   I C man wh- see, that is here
   'The man that I saw is here'
   In example a), \textit{nê yê tye min yê} is an adjunctive relative clause which has been optionally front-shifted, the noun phrase position in the base sentence being subsequently filled by the pronoun \textit{o}.

b) \textit{daga fin-man \textbackslash bê yan}
   pot black the is here
   'The black pot is here'
Example b) is derived from the underlying structure,

```
daga # S # `bé` van
  `daga` `ka` fin
```

The transformations dealing with these and other types of derived adjectives are discussed in Chapter IV.

Underlying the insertion of the question dummy symbol in the determiner position are the following observations:

1) There are two different types of questions in Bambara, i.e. information questions and true-false questions. The former ask for a further specification of the sentence, the latter ask for a judgement on whether the statement made is true or false.

2) Only noun phrases are subject to information questions in Bambara, and there is apparently no limit to the number of questioned noun phrases in any particular sentence, e.g.

```
dyón yé mun ké tyógo dyumen yorō dyumen tuma dyumen
Who C what do manner wh- place wh- time wh-
'Who did what how where when?!
```

3) Although there are adverbial question words for place, min 'where' and manner 'dí' 'how', there is no such question word for time, corresponding to 'when' in English. Time questions are formed by the word tuma 'time' and the interrogative marker dyumen. Speakers seem to accept yorō dyumen
en 'which place' and tyóko dyumé 'which manner' as being synonymous with mìn and dí. There is good reason to treat these questions as did Katz and Postal, i.e. as being derived from nouns marked with the features [+ Place] and [+ Manner] when followed by the question marker Q and dominated by the adverb node. The Bambara analysis differs somewhat from that recommended by Katz and Postal for English in that, since the noun plus the interrogative marker, dyumé, is accepted as being synonymous with the question word and since there is a neutralization of the contrast between definite and indefinite articles when Q is selected, the transformations which derive mìn and dí are optional rather than obligatory. In addition, since both transformations must state the specific lexical item to which they apply, the feature [+ Pro] is not necessary in the matrices of either yöro or tyóko.

The fact that under no circumstances does the yes-no question marker occur with information questions as in

* a yé mun ké wa (* = ungrammatical)
  he C what do ?
  'Did he do what?'

can be handled by the transformation for yes-no questions which will block any sentence containing a noun phrase dominating Q.
The inventory of possible question forms is as follows:

N → Q  a) muso dyumen
woman which 'which woman'

b) mago dyumen or dyón
person which 'who'
'which person'

c) yoro dyumen or mín
place which 'where'
'which place'

d) tuma dyumen (no short form)
time which
'which time / when'

e) tyóko dyumen or diá
manner which 'how'
'which manner'

f) mun
'what'

9. Adj → %

The adjective is to be rewritten as a lexical item.
There are only two entries in the lexicon which are marked with the feature [+ Adj]. The two adjectives, neither of which is derivable from any other source, are ba 'big' and
ni 'small'. There are a number of anomalies regarding these forms which have not as yet been satisfactorily analysed. There is for example, no fixed order to derived adjectives in Bambara, but the order is meaningful, i.e. the ordering is significant regarding the manner in which the set is delimited, e.g.

\[ \text{daga fin-man gbiri-man} \]
\[ \text{pot black heavy} \]

has a rough translation as 'a heavy one of the set of black pots' whereas,

\[ \text{daga gbiri-man fin-man} \]
\[ \text{pot black heavy} \]

has the reading 'a black one of the set of heavy pots.' When however ba or ni occur after a derived adjective, an ambiguity arises since they can either modify the noun or the immediately preceding adjective, as, for example,

\[ \text{daga fin-man ba} \]
\[ \text{pot black big} \]

which has the two readings, 'a big one of the set of black pots' or 'a very black pot'. Likewise

\[ \text{daga fin-man ni} \]

has the readings, 'a small one of the set of black pots' or 'a slightly black pot'.

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10. Art $\rightarrow$%

The article is to be rewritten by lexical replacement. The matrices for the articles contain only the opposition plus/minus $[\text{definite}]$. In Bambara, the phonological representations of this contrast are low tone for $[+\text{definite}]$ and high tone for $[-\text{definite}]$. The effects of these tones on the sentence pitch sequences will be illustrated in Chapter V. It is interesting to note at this point however that there is ample evidence in many tone languages that there can be units occurring between morpheme boundaries (+) which do not have any segmental phonemic representation, i.e. there are morphemes which are represented only by tone.

Depending on the linguistic context, the $[+\text{definite}]$ article can have either a generic or a definite reading, e.g.

\textit{muso ká nyi}

has the readings:

a) women are good (the set 'woman' is good)

b) the woman is good

Reading b) however depends on a previous reference to \textit{muso} 'woman'.

In a more complete analysis, the determiner would have to be rewritten to include demonstratives, such as \textit{ni} 'this' and \textit{a} 'that', as well as other types of post-nominal modifiers, such as \textit{dı} 'certain', \textit{dama} 'only', \textit{bę} 'all'
were 'other', si 'none' and the ordinal and cardinal numerals.

11. VP → (Past) ~ VP₁ ~ (Adv)

A verb phrase is rewritten as an optional marker for past time, followed by a sub-verb phrase (VP₁) which may in turn be followed optionally by an adverb (Adv).

12. Past →

The only time contrast in Bambara is between past as opposed to non-past. The lexical representation for past is tun ( terse in dialect areas II and IV, cf. Houis (1966) and Spears (1965)). The past marker tun may occur after any, but only one noun phrase in possessive strings preceding the sub-verb phrase, e.g.

a) né mako \ tun bé hérè \ là
   my need the past - C peace the on
   'I wanted peace'

Example a) has the alternate form

b) né tum mako \ bé hérè \ là
   my past need - C peace the on
   'I wanted peace'

Likewise

c) né ká fini \ tum bé yan
   my 's cloth past -C here
   'My cloth was here'
has the alternate form

d) né tun ká fini \ bé van

my past 's cloth -C here

'My cloth was here'

This phenomena can be treated as an optional permutation transformation operating after the possessive genitive rules with the condition that the possessive genitive group is itself not embedded.

\[ \text{13. } \text{VP}_1 \longrightarrow \text{Asp}\left\{ \begin{array}{c}
\text{NP} \sim \text{la} \sim \# \text{S} \sim \#
\end{array} \right\} \]

A sub-verb phrase is rewritten as an aspect marker (Asp) followed by either a noun phrase which is in turn followed by la plus and embedded sentence, or as an optional noun phrase followed obligatorily by a verb (V) which in turn may be optionally followed by a complement.

\[ \text{la} \sim \# \text{S} \sim \#
\]

This form serves as the base from which indirect or causative action constructions are derived, e.g.

1) a vě muso \ la taga

he C woman make go

'He made/had the woman go'

2) a vě dyíri \ la tige

he C tree the have cut

'He had the tree cut'

The deep structure of the above sentences can be illustrated by the following diagrams:
The structural description for the embedding transformation requires that the object of the base sentence be identical to the subject of the embedded sentence. As can be seen in diagram 2a), this transformation must operate after the shifting transformations discussed in Chapter II, since the subject of the embedded sentence, dyíri 'tree' is the deep structure object of the verb tige 'cut'.

Comp → NP → pp

A complement is rewritten as a noun phrase plus a post-position (pp). The term, complement, as used in this study is in some ways similar to indirect objects of Indo-European languages. Although on the surface, many adverbial constructions have the same structure, they do not have the same relation to the verb phrase.
Verbs must be classified according to the complements with which they may occur. When post-positions operate in adverbial constructions, their meaning is generally consistent and they may thus be assigned a semantic matrix. When however they operate in complements, the meaning is ascertained only in conjunction with the verb. For example, the following sentences all include a complement construction. The translation under each post-position is that which it would have when operating in an adverbial construction.

a) né yé nyō\ dí \ muso \ ma  
I C millet give woman the on  
'I gave millet to the woman'

b) a téme \ -ra \ a dígo \ ke \ kan  
he pass C his younger brother on top  
'He surpassed his younger brother'

c) né nyína \ -ra \ bára \ kə  
I forgot C work the back  
'I forgot about the work'

d) fíni \ bé-na \ ké \ muso \ fə  
fonio will do woman the directed  
'The woman will have the fonio'

e) a ké \ -ra \ móri \ nyi-man \ yé  
he do C teacher good a as  
'He became a good teacher'
Perhaps the most powerful argument for the differentiation of noun phrase plus post-position construction into both complements and adverbs is that none of the above statements could be used as an answer to an adverbial question, i.e. they have nothing to do with the categories of time, place, manner, purpose, etc.

The fact that the above complement constructions can have identical counterparts in adverbial constructions gives rise to numerous ambiguities, but the analysis as presently constructed can give an adequate illustration of the differing structures which underly the ambiguity.

15. Asp $\rightarrow$ %

The aspect marker is to be rewritten by lexical replacement. The intersections of features for the aspect markers produce the following matrices.
1. [+ completive, - negative]

Ex: \( \text{yé} \hspace{0.5cm} \text{a yé fini `ta} \)

he C cloth the carry

'He carried the cloth'

When the [+ completive, - negative] aspect marker \( \text{yé} \) is followed directly by the verb, it is permuted to a position after the verb and replaced by \( -\text{ra} \)

Ex: \( \text{a yé tágà} \Rightarrow \text{a tágà -ra} \)

he C go he go C

'He went'

This permutation transformation must follow the shifting transformations outlined in Chapter III, e.g. the sentence

\( \text{dyírí ` tígé -ra} \)

tree the cut C

is derived first by the shift of the object to subject position, after which the aspect marker is shifted.

2. [+ completive, + negative]

Ex: \( \text{má} \hspace{0.5cm} \text{a má fini `ta} \)

he C cloth the carry

neg

'He didn't carry the cloth'

\( \text{a má tágà} \)

he C go neg

'He didn't go'
Notice that there is no difference between transitive and intransitive completive aspect markers when negative.

3. \([-\text{completive}, -\text{negative}, -\text{stative}, -\text{anticipated}]\]  
   Ex: bé a bé dyíri \(\times\) tige  
   he -C tree the cut  
   'He cuts trees'
   
   a bé tága  
   he -C go  
   'He goes'

4. \([-\text{completive}, +\text{negative}, -\text{stative}, -\text{anticipated}]\]  
   Ex: té a té dyíri \(\times\) tige  
   he -C tree the cut  
   'He doesn't cut trees'
   
   a té tága  
   he -C go
   neg  
   'He doesn't go'

5. \([-\text{completive}, -\text{negative}, +\text{stative}, -\text{anticipated}]\]  
   Ex: bé...-la a bé dyíri \(\times\) tige -la  
   he +St tree the cut  
   'He is cutting trees'
   
   a bé na -la  
   he St come  
   'He is coming'
In example 5, a permutation transformation is required to shift -la to a position after the verb. This aspect is almost entirely lost in Bambara but is found in dialect areas III, IV and VIII. It has been replaced in Bambara by either a nominalization of the verb, or by a present participial form, both of which will be described later.

6. [-completive, +negative, +stative, -anticipated]
Ex: té...-la a té dyíri tige -la
he St tree the cut
neg
'He isn't cutting a tree'

a té na -la
he St come
neg
'He isn't coming'

7. [-completive, -negative, -stative, +anticipated]
Ex: bé -na a bé-na dyíri \ tige
he Ant tree the cut
'He will cut the tree'

a bé-na na
he Ant come
'He will come'

8. [-completive, +negative, -stative, +anticipated]
Ex: té -na a té-na dyíri \ tige
he Ant tree the cut
neg
'He will not cut the tree'
Rather than include negative as a choice in the aspect feature matrix, it would be equally possible to include a dummy symbol for negative in the branching rules and to have a transformation rewriting the affirmative aspect markers as negative. There are several reasons why this alternative was not selected. In the first place, as was illustrated above, no negative morpheme is added to the sentence, but rather the negative and affirmative aspect markers are commutable. In the second place, the aspect marker is deleted in most nominalizations, e.g.

\[ \text{Sédu ká súgu \ la tága} \]

'Seydou's going to the market'

where \( ká \) is the morpheme for possessive genitive links as well as for linking the subject to a predicate in a nominalization. Since the negative feature is included in the deleted aspect market, there is no direct equivalent in Bambara to the English nominalization,

'Seydou's not going to the market'

In order to express the concept of the above sentence, the Bambara would generally choose the following construction.
Sédu ká súgu \lá tága báli-va
Seydou 's market the to go refuse-al
'Seydou's refusal to go to the market'

16. V → %
The verb is to be rewritten by lexical replacement.
The features in the verbal syntactic matrix will be dis­
cussed later in this chapter.

17. pp → %
The post position is likewise to be rewritten by
lexical replacement.

Surface vs. Deep Structure

Before developing the way in which adverb and sentence
adverbs are to be rewritten, it may prove interesting to
compare the minimal preterminal string generated by the
above rules with the basic sentences enumerated at the
beginning of this chapter. Disregarding the indirect
action construction, and including the optional object
noun and noun phrase plus post-position complement, there
is only one type of minimal preterminal string, i.e.

NP ⌈ Asp ⌈ ( NP ) ⌈ V ⌈ ( Comp )

The preterminal string above matches fairly closely
the basic sentences in II A and II B, but the basic
sentences I A through D and II C and D are not considered
as 'basic' in terms of the branching rules, i.e. they are all derived from the minimal pre-terminal string given above.

The sentences in basic sentence set I A all include the word, do, which is here considered as replacing the underlying predicate of the branching rules under given conditions. For example, in the following discourse situations, the rules of performance show a preference for replacing the predicate in the first statement by do.

a) i. dyón na-ra
   who come C
   'Who came?'

   ii. Sédu do
       Seydou it's
       'It's Seydou'

   Sentence ii. is preferred over

   iii. Sédu na -ra
   Seydou come C
   'Seydou came'

   Similarly, in the following sentences ii. is preferred over

   iii.

   i. mun yé nin yé
   what -C this as
   'What's this'
ii. *daga \ do*
   pot the it's
   'It's a pot'

iii. *daga \ vé nin vé*
   pot the -C this as
   'This is a pot'

The **do** form is also used when the object being referred to or questioned is in the presence of both speakers, i.e. it is 'understood', e.g.

c) *mun do*
   what it's
   'What is it'

An alternate analysis which is equally feasible is to treat **do** as a variant of the emphatic marker **de**. There are, in fact, dialects where both forms are the same. According to this treatment, the rules of performance show a preference for emphasizing the sentence in response to a question, after which the sub-verb phrase would be erased, leaving only the past marker if present in the underlying verb phrase and the emphatic marker **do**, e.g. In response to the question,

a) *dyón tum bé van*
   who past -C here
   'Who was here'
the underlying response would be as follows:

b)  **Sédu tum bé van dé**  
Seydou past -C here Emp  
'Seydou was here'

The sub-verb phrase *bé van* would then be optionally erased, creating the following sentence:

c)  **Sédu tum do**  
Seydou past Emp  
'It was Seydou'

Additional evidence in support of the latter analysis of *do* as a variant of the emphatic marker is found in the fact that in all 'identificational' sentences using *do* without any other predicate, the noun phrase preceding *do* is marked with the definite article, which is precisely the phenomena that transpires when a noun is emphasized. There is thus no contrast between definite and indefinite articles when *do* is used.

Another use of *do* is found in the following sentences.

d)  **tye \ sigi-to do**  
man the sitting Emp  
'The man is (in the act of) sitting'

e)  **tye \ sigi-lén do**  
man the sit-ed Emp  
'The man is seated'
It would be tempting to consider the above forms as part of the verbal paradigm in which *do* serves as some kind of a predication marker. However, when the above sentences are embedded into another sentence as in

\[ \text{g') né bé a fe tyε'sigi - to ka kέ} \]

'I want the man to be sitting down'

\[ \text{h') né bé a fe tyε'sigi-len ka kέ} \]

'I want the man to be seated'

it becomes apparent that the predicate of sentences d) and e) is actually a [+ stative] aspect marker plus the verb *kέ* 'do, be etc.' When the sentence is embedded, the predicate is not deletable as in sentences g) and h) above.

The sentences in basic sentence types I B - D, all have the structure

\[ \text{NP} \curvearrowright \text{Asp} \curvearrowright \text{NP} \curvearrowright \text{pp} \]

in which the final noun phrase plus post-position is analysable as either a complement or a locative adverb of the deleted verb *kέ* 'do, be.' This analysis is motivated by the following observations:

1. In non-embedded sentences of types I B through I D, which contain aspect markers with the features [+ completive] or [+ anticipated], the verb *kέ* is
present, e.g.

a) a bë-na ké dugu-tigi \ ye
   he will be chief a as
   'He will be a chief'
b) a ké -ra móri nyi-man \ ye
   he be C teacher good a as
   'He became a good teacher'
   or
   'He is a good teacher'
   The two reading, 'is' or 'became' in example b) result from the fact that the completive aspect indicates only that the action described was accomplished. It does not indicate whether the state resulting from that action is still a reality.
c) daga \ bë-na ké tabili \ kan
   pot the Ant be table the on
   'The pot will be on the table'
d) dén \ u bë-na ké hërg \ fe
   child -s Ant be peace the directed
   'The children will want peace'
e) a bë-na ké dyírë \ tige \ lâ
   he Ant be tree the cut the at
   'He will be cutting a tree'
2. When the above sentences are embedded into another sentence, the verb ke is always present.

a) a wolo -ra ka ke dugu-tigi 'vé
he born C to be chief the as 'He was born to be the chief'
b) né be a fè kitabu 'ka ke tabili kan
I -C it directed book to be table the on 'I want the book to be on the table'
c) án té a fè a ka ke kèle 'ké 'lá
we St it directed he to be fight the do the at neg 'We don't want him to be fighting'

3. The verb ke 'be, do' can also be used transitively. When it has a locative adverbial it can only be translated in English by the verb 'put', e.g.

a) a yé tiga 'ké boro 'kono
he C peanuts the be bag the in 'He put the peanuts in the bag'

Given this evidence, it would not seem unreasonable to posit the presence of the verb ke in the underlying structure. The verb is then deleted when the feature [+ stative] is present in the aspect matrix, the verb is not preceded by an object, and the sentence is not embedded.
The treatment of basic sentence set II D, the predicate adjectives, warrants a similar although somewhat more subtle treatment. When an adjectival verb, i.e. a verb marked with the feature [+ Adj] is preceded by an aspect marker with the feature [+ stative], the aspect marker will be represented by ká and the base form of the adjectival verb will be used, e.g.

a) bára \ ká gbelen
   work the is difficult
   'The work is difficult'

b) dyí \ ká súman
   water the is cool
   'The water is cool'

c) sonsan \ ká kékun
   rabbit the is crafty
   'The rabbit is crafty'

When, however, the aspect marker contains the features [+ completive] or [+ anticipated], or when the sentence is embedded, the regular verbal aspect markers are used and the suffix -ya is added to the base form of the adjectival verb, e.g.

a) bára \ bé-na gbelen -ya
   work the Ant difficult
   'The work will be difficult'
b) dyí \ súman-ya -ra
water the cool C
'The water became cool'

c) a té a ra sonsan\ka kékun -ya
he St it directed rabbit to crafty neg
'He doesn't want the rabbit to be crafty'

d) a bé sé ka nyi -ya
he -C arrive to good
'He can be good'

It is also interesting to note that the nominalized forms of adjectival verbs occur with the suffix -ya, e.g.

a) dyí \ ká súman-ya
water the cool -ness
'The water's coolness'

b) sonsan \ ká kékun-ya
rabbit the 's crafty-ness
'The rabbit's craftiness'

Whether the -ya suffix on the nominalized form is the same as that on the verb, or whether it is the same as that used to form abstract nouns, such as

fa - ya
father -hood

or whether, in fact, all of these are the same morpheme, is not decidable.
As has been demonstrated above, the two major sets of basic sentences and eight subsets based on a surface structure classification of Bambara sentences are all analysable as being derived from one preterminal string.

18. \[ \text{Adv} \rightarrow \begin{cases} \text{Adv}_1 \left( \# S \# \right) \\ \text{NP} \left( \text{pp} \right) \end{cases} \]

An adverb is rewritten as either a sub-adverb (Adv$_1$) followed optionally by an embedded sentence, or as a noun phrase followed optionally by a post-position. These two options are illustrative of the deep structure of all adverbials. There are a large number of very delicate constraints placed on the choice of post-positions in relation to the preceding nominal which would have to be accounted for in a more complete study, but which will not be developed to any extent here.

Ex:

\textbf{Adv}_1$

a) \text{daga \`ka\' fin kirin kirin} \\
    pot the is black very black

b) \text{daga \`fa - ra t\'en t\'en t\'en} \\
    pot the fill C up to the top
    'The pot filled up to the top'
c) a má a ké fés fés
he C it do at all
neg 'He didn't do it at all'

Adv # S #

a) a tun bé bára \ lá fó ka tága a bila kúnu
he Past St work at Adv₁ # S #
til to go it leave yesterday

'He was working until yesterday'

b) né yé bára \ ké fó né muso \ ka na
Adv₁ # S #
I C work the do til my woman the to come

'I worked until my wife came'

c) né má dúmu-li \ ké kabíni né muso \ tága -ra
Adv₁ # S #
I C eat ing the do since my woman go C
neg 'I haven't eaten since my wife left'

d) né bé-na tila a lá sani a ka tága
I Ant finish it at before he to go

'I'll finish it before he goes'

The time adverbial sani 'before' as in d), differs from both fó 'up to' and kabíni 'since' in that with sani the embedding transformation replaces the auxiliary of the embedded sentence with ka, whereas with the other
adverbials, this replacement is optional.

e) a bé bóli iko a bé siran
   he -C run like he -C fear
   'He runs like he is afraid'

f) a bé bóli iko sonsan
   he -C run like rabbit
   'He runs like a rabbit'

In example g), the embedded sentence in the deep structure is sonsan \bé bóli\ 'the rabbit runs.' The auxiliary and the verb are erased by transformation.

g) a bé bárà \kjé\ walasa a dèn \ka dúmu-li \kjé
   Adv₁ # S #
   he -C work do so that his child the to eat-ing
   'He works so that his child may eat'

h) a té kalon tige barisa a té sé a vëlema kó \lá
   Adv₁ # S #
   he -C lie cut because he -C arrive it change at
   neg neg
   'He doesn't lie because he isn't able to change it'
   (the truth)

NP\pp

a) a bé na sét herë \lá
   he -C come 7 o'clock at
   'He is coming at seven'
b) *a bé na wula\' fe*
   he -C come afternoon the directed
   'He is coming during the afternoon'

c) *a vé a ké tyóko nin lá*
   he C it do manner this at
   'He did it in this way'

d) *a vé doni\' bila só kere\' fe*
   he C load the put house side the directed
   'He put the load by the side of the house'

e) *a vé wári\' dí muso\' ma Sédu kósón*
   he C money the give woman the to Seydou behalf
   'He gave the money to the woman on Seydou's behalf'

The following four examples all contain various uses of the associative post-position *ni...vé*, which requires a permutation transformation placing *ni* in a position before the preceding noun phrase.

f) *Bakari na -ra ni a muso\'vé*
   Bakari come C with his woman the
   'Bakari came with his woman'

g) *a vé dig\'tigé ni dyéle\' vé*
   he C wood the cut with axe the
   'He cut the wood with the axe'

h) *u vé a fana ni tiga\' vé*
   they C him feed with peanuts the
   'They feed him with peanuts'
i) *fini min k’a fisa ni o ye*

cloth this is better with that

'This cloth is better than that'

19. Adv → %

The sub-adverb is to be rewritten by lexical replacement. A number of these sub-adverbs were given in the above examples, e.g. fó 'up to', kabíni 'since', sani 'before', walasa 'so that', etc.

20. SA → \{Cond₁ \} → # S #

\{Cond₂ \}

# S # o # S # o ... 

A sentence adverb is rewritten as a conditional type-one (Cond₁) or as a conditional type-two (Cond₂) followed by an embedded sentence, or as a possibly infinite string (represented by ...) of embedded sentences linked by o.

Cond₁

A conditional type-one has the lexical representation ni 'if', when'. The major problem that arises with the embedding transformations for conditional sentences concerns the possible combinations of aspects in the base and embedded sentences. The only occurrence of the anticipative aspect with the past marker is when there is a conditional present. This constraint could be accounted
for by the addition of the feature \([+ \text{Past} \text{Cond}]\) which would be read, occurs in the environment Past only when there is a conditional present. It appears that almost the same constraint is necessary for English auxiliaries.

\[ a) \text{án bé-na tága súgu `lá, ní muso `na-ra} \]
we Ant go marker the at, if woman the come C
'We will go to the market if the woman comes'

\[ b) \text{ní án tum bé dugu `kono , án tun na tága a fo} \]
if we past St village the in, we Past Ant go him greet
'If we were in the village, we would have gone to greet him'

In example b), the conditional embedded sentence has been permuted to sentence initial position. The anticipated marker in the base sentence has been reduced by an optional rule, i.e. \(\text{bé-na} \Rightarrow \text{na}\). It is to be noted however that this reduction is only possible when the feature \([-\text{negative}]\) is present.

\(\text{Cond}_2\)

The conditional type-two is similar to English sentences with a conditional stated by a hypothetical 'were' followed by the infinitive. In Bambara, the lexical representation of \(\text{Cond}_2\) is \(\text{mana}\) which replaces the aspect marker in the embedded sentence.
c) a mána a ké, i ka a fo né ye  
he C₂ it do, you to it tell me to   
'Were he to do it, you should tell me'  

d) a tun mána ké van , i korɔ tun té-na sa  
he past C₂ be here, your elder Past Ant die  
'Had he been here, your older brother would not have died'  

# S # ~ õ ~ # S # ...  

Some uses of this construction are similar to  
'whether...or' constructions in English, e.g.  

e) sán dyi na-ra -ó, tile bó-ra -ó, án bé-na tága  
rain the come C -o, sun the leave C -o, we Ant go  
'Whether rain comes or the sun is out, we will go'  

f) a ye a fo -ó, a má a fo -ó, tiyen te  
he C it say -o, he C it say -o, truth the isn't  
'Whether he said it, or he didn't say it, it isn't true'  

From the above type of construction, one can derive  
'whatever' constructions when the two sentences linked by  
ó are the same.  

g) muso -ó - muso na -ra, o ye dugu tigi fo  
woman -o woman come C, that C chief the greet  
'Whatever woman came, she would greet the chief'  

h) a ye a ké tyóko-ó-tyóko, a tun ká gbelen  
he C it do manner o manner, it Past be difficult  
'Whatever way he did it, it was difficult'  

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Summary of Branching Rules

The branching rules which illustrate the deep structure of all Bambara sentences are as follows:

1. \( \# S \# \rightarrow \{ \# S \# \uparrow C_1 \rightarrow \# S \# \} \)
   \[ \{ C_2 \} \]
   \[ C_3 \] \[ NP \rightarrow VP \rightarrow SA \] 

2. \( NP \rightarrow \{ \{ \text{Pro N} \} \rightarrow \{ \text{N} \rightarrow D \} \rightarrow \{ \text{Num} \} \rightarrow \# S \# \} \)
   \[ \# S \# \rightarrow Q \]

3. \( \text{Num} \rightarrow \{ \text{Sg} \} \)
   \[ \{ \text{Pl} \} \]

4. \( \text{Sg} \rightarrow \% \)

5. \( \text{Pl} \rightarrow \% \)

6. \( \text{ProN} \rightarrow \% \)

7. \( \text{N} \rightarrow \% \)

8. \( D \rightarrow (\text{Adj} \rightarrow (\{ \# S \# \} \rightarrow \text{Art} \)
   \[ Q \] \)

9. \( \text{Adj} \rightarrow \% \)

10. \( \text{Art} \rightarrow \% \)
Before discussing the features that apply to nouns and verbs, a few of the conventions employed in the lexicon must be explained. There are two types of features, inherent and contextual. With inherent features, the oppositions are truly binary, such as, for example, plus/minus [concrete]. Both plus and minus features
are necessary for the specification of linguistic contexts. Since the features can only be plus or minus, by convention all lexical items not marked plus for a particular inherent feature will be understood to contain a minus for that feature. With this convention, only plus inherent features will have to be stated in the syntactic matrix.

With contextual features, the problem is somewhat more complex. Given the context,

_____ Y

there is actually a trinary contrast of possible linguistic specifications. One might wish to say for example that the context, _____ Y, is necessary for X, i.e. X cannot occur without Y, or one might wish to say that given the context, _____ Y, X cannot occur, or finally, one might wish to say that given the context, _____ Y, the occurrence of X is optional.

To handle the first type of constraint, the following feature is to be read, ' Y is necessary for X.'

\([+ \quad Y]\)

Technically, the feature \([- \quad Y]\) should be read ' Y is not necessary for X', and the feature for the second type of constraint, i.e. the positive specification that X may not occur in the context Y, should be stated in a manner like the following,
In an effort to reduce the complexity in writing this feature, the form \([- \ldots Y]\) will be used, with the understanding that the feature \([- \ldots Y]\) is not to be read as the negation of the feature \([+ \ldots Y]\).

Where an item is optional in a given context, it will simply be unmarked.

**Nominal Features**

The following features are those which are found in the syntactic matrices for nouns.

1. \([+ N]\)
2. \([+ \text{ non-count}]\)
   Nouns with the feature \([+ \text{ non-count}]\) do not occur with numeral quantifiers, e.g. dyi 'water'
3. \([+ \text{ concrete}]\)
   There are verbs which require a \([+ \text{ concrete}]\) object, e.g. kári 'split' requires a noun marked with \([+ \text{ concrete}]\) such as dógo 'wood'
4. \([+ \text{ animate}]\)
   There are verbs which require \([+ \text{ animate}]\) subjects, e.g. bóli 'run'
5. [+ human]
   Certain verbs require [+ human] subjects, e.g. fů 'say', míři 'think'

6. [+ active]
   Certain verbs require a [+ active] noun such as bāra 'work' for subject, e.g. gbeleŋ '(be) difficult'
   [+ active] nouns require the post-positions kan or lá in adverbial constructions, e.g.

   a bé-na ké bāra ' lá
   he Ant be work the at
   'He will be working'

   a tága-ra bāra ' kan
   he go C work the on
   'He went to work'

7. [+inalienable]
   [+inalienable] nouns are linked directly to nouns in genitive compounds, e.g. fa 'father', bôlo 'arm'

   né fa
   my father

   muso ' korpo
   woman the older sibling
   'The woman's older sibling'
[inalienable] nouns are linked to the possessor by ká, e.g. kitabu 'book', só 'house'

né ká kitabu
I 's book

'My book'

muso · ká só
woman the 's house

'The woman's house'

Possessive constructions from which the above genitives are derived are formed with locative adverbials using the post-positions fe 'directed' bólo 'arm/hand' or kun 'head', e.g.

wári · bé tye · bólo
money the St man the hand

'The money is in the man's hand'
or

'The man has money'

wári · bé tye · fe
money the St man the directed

'The man has money'

wári · bé tye · kun
money the St man the head

'The money is on the man'
or

'The man has money on him'
A very complex constraint must be stated for these constructions. Only [- inalienable] nouns can occur as subjects of these constructions with the post-positions *kun* and *bólo*.

8. \([+ \, tő]\)
Some nouns can form adjectival modifiers by the addition of a suffix \(-tő\), e.g.

\[
\text{tyɛ́ \# kɔŋɔ \# bé \, tyɛ́ \, lá \# \, bé \, yan}
\]

man \# hunger the St man the at \# the is here

becomes

\[
\text{tyɛ́ kɔŋɔ-\,tő \# bé \, yan}
\]

man hungry the is here

'The hungry man is here'

9. \([+ \, ma]\)
Some nouns can form adjectival modifiers by the addition of the suffix *ma*, e.g.

\[
\text{na \# dyí \# bé \, na \, lá \# \, bé \, yan}
\]

sauce \# water the St sauce the at \# the is here

becomes

\[
\text{na \, dyí\,-\,ma \# bé \, yan}
\]

sauce water-y St here

'The watery sauce is here'
Sample nominal lexical entries

bára 'work' [+ N ]
dyf* 'water' [+ N , + non-count , + ma, + concrete ]
dyf* 'fear' [+ N , + non-count , + to ]
dyfiri 'tree' [+ N , + concrete , + ma ]
fanga 'strength' [+ N , + non-count , + inalienable , +ma ]
kongo 'hunger' [+ N , + non-count , + to ]
koro 'older sibling' [+ N, + concrete, + animate,
+human, + ma, + inalienable ]
muso 'woman' [+ N , + concrete, + animate, + human, + ma ]
tyoko 'manner' [+ N, + inalienable ]
só 'house' [+ N, + concrete ]
sô 'horse' [+ N, + concrete, + concrete, + animate,
+ ma ]
tile 'sun' [+ N, + concrete, + ma ]
tiyén 'truth' [+ N, + inalienable, + non-count ]
mogo 'person' [+ N, + concrete, + animate, + human, + ma ]
na 'sauce' [+ N, + non-count, + concrete, + ma ]
nun 'nose' [+ N, + concrete, + inalienable ]
nyé 'eye' [+ N, + concrete, + inalienable ]

Lexical entries for post-positions

In a more delicate study, the post-positions would
have to be assigned features based on the nouns with which
they occur, such as, for example, [+ concrete _____ ]
for post positions like kono 'in'. Such a classification has not been attempted in this study and that which follows is simply a listing.

bólo 'on'
fe 'directed'
kan 'on'
ko 'after'
kono 'in'
koro 'under'
kun 'head' (used as possessive post-position)
lá 'at'
ma 'on'
nyé 'before'
yé 'as'

Verbal syntactic features

As with the nominal features, a great many more features would be required for a complete specification of the syntactic behavior of verbs. Only a few of the necessary features will be discussed below.

1. [- NP ——— ]

Verbs marked with this feature are those which cannot occur with a noun phrase object, e.g. tága 'go', na 'come'

2. [- ——— Comp]

Verbs marked with this feature are those which do
not occur with noun phrase complements, e.g. tága 'go', kári 'split'.

The following features are subsets of feature two, indicating which complement post-positions occur with which verbs.

2a. [+ ______ NP^kan ]
   This set of verbs takes kan as the post-position in complements, e.g.
   
   bin ...kan
   fall on
   'begin'

2b. [+ ______ NP^ko ]
   This set of verbs occurs with the post-position ko in complements, e.g.
   
   nyina ...ko
   forget back
   'forget about'

2c. [+ ______ NP^koro ]
   This set of verbs occurs with the post-position koro in complements, e.g.
   
   dimi ...kora
   anger under
   'become angry with'

2d. [+ ______ NP^lá ]
   This set of verbs occurs with the post-position lá in complements, e.g.
sé ...lè
arrive at
'to be able to'

2e. [+ _____ NP^ma]
This set of verbs occurs with the post-position
ma in complements, e.g.
dí ...ma
give on
'give to'

2f. [+ _____ NP^nyé]
This set of verbs occurs with the post-position
nyé in complements, e.g.
siran ...nyé
fear before
'be afraid of'

3. [+ [human] Asp ... _____ ]
Some verbs only occur with a [+ human] noun subject,
e.g.
fo 'say'
miri 'think'

4. [+ [human] _____ ]
Some verbs only occur with a [+ human] object, e.g.
són 'grant, provide'

5. [+ [concrete] _____ ]
Some verbs only occur with a [+ concrete] noun
object, e.g.
bugo 'strike'
kári 'split'

This feature refers to the type of nominalization which may operate as subject, e.g.

gbelen 'to be difficult'

requires that the embedded sentence dominated by the subject noun phrase be transformed to an active nominal.

Sample verbal lexical entries (feature [+ V] is understood)

bán 'end' [- NP ___ , + ___ NP\^l\á ]
ban 'refuse' [- NP ___ , + ___ NP\^ma , + [human]

Asp ___ ]
bóli 'run' [- NP ___ , - ___ Comp , +[animate]

Asp ___ ]
bugo 'hit' [- ___ Comp , +[concrete] ___ ]
dími 'pain' [- ___ Comp , +[human] ___ ]
dúmu 'eat' [- ___ Comp , +[animate] Asp ___ ]
dyán 'be long/far' [- NP ___ , + ___ NP\^l\á ]
ké 'do, be' [+ ___ NP\^f\c , + ___ NP\^y\é ]
kári 'split' [- ___ Comp , +[concrete] ___ ]
mín 'hear' [+ ___ NP\^l\á , + [human] Asp ___ ]
mén 'last' [- NP ___ + ___ NP\^l\á ]
són 'provide' [+ ___ NP\^ma , + [human] Asp ___ , +[human] ___ ]

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A few samples of P-markers that can be generated by the branching rules in addition to the lexical replacement transformations are as follows:

**Figure 3**

**Simple P-marker**

```plaintext
don 'agree'  [- NP , + NP ila, +[human] Asp ]
sé 'arrive'  [- NP , + NP ila]
temé 'pass'  [- NP , + NP kan]
tága 'go'  [- NP , - Comp ]
```

Sample P-markers

A few samples of P-markers that can be generated by the branching rules in addition to the lexical replacement transformations are as follows:
muso \ yé daga \ san
woman the C pot the buy
'The woman bought the pot'

Sentences with an identical branching diagram, but with
different lexical replacement are as follows:

a) tye \ yé dyíri \ tige
man the C tree the cut
'The man cut the tree'

b) sama \ bé bin \ dúmu
elephant the -C grass the eat
'The elephant eats grass'

The branching diagram in Figure 3 can also be represented
by the diagram in Figure 4.
Figure 4

```
muso \[ Art \] \[ Sg \] \[VP \[ Asp \[ daga \[ Num \[ Sg \] \[ VP \]
```

muso \ ye \ daga \ san

'The woman bought the pot'
By transformation, the aspect marker ye is permuted to verb final position and then replaced by -ra, which produces,

tye \ ban -ra wari \ ma

man the refuse C money the on

The tree in figure 5 can again be represented by the bracketed diagram in figure 6.
"The man refused the money!"
The string generated by the above rules is as follows:

\[ \text{woman the Ant come} \quad \text{man the -s Ant come} \]

'The woman will come' 'The man will come'

The conjoining transformation reorders the above string to either

a) \[ \text{woman the Ant come and man} \]

'The woman will come and the man, too'

or
b) muso \ ani tyɛ \ bé-na \ na
woman the and man the will come
'The woman and the man will come'

Figure 8

Complex P-marker

The embedding transformation which, operating on the above phrase marker, deletes the subject noun of the embedded sentence by matching it with the object of the base sentence, which produces eventually
muso \ ye den \ la tāga
woman the C child the go
'The woman made/had the child go'

Figure 9

Complex P-marker

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The above string is transformed to
\[ ty\varepsilon \text{ sgi- len } \sim \text{ be sun\varepsilon} \]
man sit - ed the is sleeping
'The seated man is sleeping'

The embedding transformation for this sentence is dis-
cussed in Chapter IV.
Chapter III

Some Shifting Transformations

The only surface structure distinction between a passive sentence such as,

a) \textit{dyuru $\backslash$ tige -ra $\backslash$ mogo $\backslash$ fe}
rope the cut C person a directed
'The rope was broken by someone'

and an 'Intransitive' sentence, such as

b) \textit{dyuru $\backslash$ tige -ra}
rope the cut C
'The rope broke'

is the presence of the passive agent \textit{mogo $\backslash$ fe} 'by someone'. A distinction must be made between the two because when the passive agent in a) is deleted, a) and b) are phonologically identical, thus producing an ambiguity, i.e. b) actually has two readings, 'the rope broke' and 'the rope was broken.' The question of whether the base rules should generate the intransitive member of this pair has not been satisfactorily answered in the preceding rules. The syntactic constraint found in the verbal complex symbol only disallows certain verbs from occurring in the context NP ___. This constraint does not disallow
verbs such as *tige* 'cut/break' from occurring in the context Asp ____, i.e. the above analysis allows *tige* to occur either with or without a preceding object noun phrase. This means that the intransitive reading of sentence b) would be generated directly by the base rules, as well as a transitive sentence such as

   c) *mogo ye dyiri ~ tige*

   person a C tree the cut

   'Someone cut the tree'

The weakness of this approach is that if verbs such as *tige* are allowed to occur either transitively or intransitively, the grammar would have to include identical constraints regarding the subject with which it may occur when intransitive and the object when transitive.

In looking at the other Mande languages, it appears that a number of them do not have any construction strictly definable as a passive, since there is no possibility of expressing the agent, but a great number of transitive sentences have parallel intransitive sentences in which the object of the transitive sentence is the subject of the intransitive sentence. It may be that to adequately account for this phenomenon and avoid the duplication of cooccurrence constraints, the first branching rule should be revised as follows:
where Shift is a dummy symbol indicating that the object of the verb is to be moved into subject position. The non-passive sentence b) would then be derived from the underlying P-marker in Figure 10.

**Figure 10**

```
S  →  {NP Shift}  →  VP

Shift   VP

VP

Asp

ye dyuru  tige

N  D  Num  tige

N  Art  Sg  Ø

C  rope the cut
```

To disallow the selection of transitive verbs in the branching rule context Asp ____, the feature [- NP ____]
of the verbal matrix would have to be replaced by the two features \([+ \text{ Asp } \text{ ___} \text{ ___}]\), for intransitive constructions and \([+ \text{ NP } \text{ ___} \text{ ___}]\), for transitive constructions.

Expanding the notion of the dummy symbol Shift, it could also be used in the rewriting of the object noun phrase. Rule 13 could be revised to include the following:

\[
\text{VP}_1 \rightarrow \text{Asp} \left( \left\{ \begin{array}{c} \text{NP} \\ \text{Shift} \end{array} \right\} \right) \rightarrow V
\]

In this case, the symbol Shift could be used to account for the situation wherein the verb is nominalized and shifted into object position, the verbal position being filled by the verb, \(\text{ke}\), e.g.

\[d) \quad \text{mogo \ ye \ Shift \ tige} \]

\[\begin{array}{l}
\text{person} \\
\text{the C cut}
\end{array}\]

where \(d)\) would represent the deep structure of the sentence,

\[e) \quad \text{mogo \ ye \ tige \ -li \ ke} \]

\[\begin{array}{l}
\text{person} \\
\text{the C cut - ing do}
\end{array}\]

'The person did cutting'

This phenomenon could also be treated by an object deletion transformation, but as was pointed out above, a number of problems arise with the recovery of deleted items, all of which are circumvented by the revised analysis suggested here.
Two additional features would have to be added to the verbal complex symbol, i.e. [- Shift Asp.] for those verbs which do not occur with the dummy symbol Shift in subject position, and [- Shift] for those verbs which do not occur with the dummy symbol Shift in object position.

There are many sentences which have an underlying structure in which both the subject and object positions are analysable as being filled by the dummy symbol Shift, e.g.

1) kar an \bé ké

study the -C do

'Studying transpires'

has the underlying P-marker

\[
\begin{align*}
&\left[\left[\text{Shift}\right]\right] \quad \left[\left[\left[\text{bé}\right]_{\text{Asp}}\right]\left[\text{Shift}\right]\left[\text{karan}\right]\right]\right] \\
&\#S# \\
&\text{VP}_1 \\
&\text{VP}_2
\end{align*}
\]

The first transformation shifts the verb kar an into the object position, filling the verb position with ké

T1: \( X, \text{Shift}, V, Y \Rightarrow X, \left[\left[\text{V}\right]\left[\text{\text{	extasciitilde}}\right]\right], \left[\text{ké}\right], Y \)

\[
\begin{array}{cccc}
1 & 2 & 3 & 4 \\
\end{array} \Rightarrow \begin{array}{c}
1 & 3 \\
4
\end{array}
\]

\[\text{Shift bé, Shift, karan} \Rightarrow \text{Shift bé, karan, k}\]
The second transformation shifts the nominalized verb karan from object position to subject position, e.g.

T2:  \[ \text{Shift, Asp, NP, } X \Rightarrow NP, \text{ Asp, X} \]
\[ 1, 2, 3, 4 \Rightarrow 3, 2, 4 \]

# Shift, bé, karan, ké \Rightarrow karan, bé ké

The type of construction derived by transformational rule 2 is common to all Mande languages, whereas the passive construction described below is relatively rare.

The corresponding passive sentence,

2) karan \( \backslash \) bé ké

studying the -C do

'Studying is done'

is derived from the underlying P-marker

\[
\begin{array}{c}
\text{[mog]}_N \text{ Art} \left[ \text{[bé]}_v \text{ [Shift]} \text{[karan]}_v \right]
\end{array}
\]

T-1 shifts the verb karan 'study' into object position producing the derived P-marker

\[
\begin{array}{c}
\text{[mog]}_N \text{ Art} \left[ \text{[bé]}_v \text{ [Shift]} \text{[karan]}_v \right]
\end{array}
\]
3) mogo / bê karank / ké

person a -C studying the do
'Someone does studying'

The passive transformation shifts the object noun phrase to subject position, shifting the subject to an agent position.

T-3 optional
SD: NP, (Past) [Asp, NP, (Caus) V X] Y ]
   VP [VP₁ VP₂]

is transformed to

NP, [(Past) [Asp, (Caus) V X] Y, [NP, [bôlo]] ]
   VP [VP₁ VP₂]

3 2 4 1

Sentence 3), for example, is thus transformed to

4) karank / bê ké mogo / fe

studying the -C do person a by
'Studying is done by someone'

An optional deletion transformation then operates deriving 2) from 4).
The deletion transformation thus produces

2) karan \ bé ké

studying the is done

'Studying is done'

The structural description for the transformation specifically states that only mogo 'person', fén 'concrete thing' and kó 'abstract thing' are deletable. The recovery of the exact deleted item can be guaranteed by the complex symbol feature of the deep structure verb of which the deleted item was subject. In 2), for example, the deep structure verb is karan which is marked with the feature \([+ [-human]. Asp..\)]. Given this feature and the rule \(T^{-1}\), mogo 'person' is uniquely recoverable.

Additional examples of the passive transformation are given below.
a) *tye ye wári dé né ma*

man the C money the give me to
'The man gave the money to me

*wári dé-ra né ma tye bólo*

money the give C me to man the hand
'The money was given to me by the man'

The above example illustrates that the transformation which shifts the completive aspect marker to a suffix position for intransitive constructions must operate after the passive transformation. The rule is as follows.

$$T-5$$

$$X \left[ \text{ye} \right]_A, V, Y \quad X, V \left[ -ra \right]_A, Y$$

$$1, 2, 3, 4 \quad 1, 3, 2, 4$$

The forms *ye* and *-ra* being allomorphs, the syntactic and semantic matrices remain unchanged after the permutation. Only the phonological matrix is modified.

b) *muso bé fini san*

woman the -C cloth the buy
'The woman buys cloth'

*fini bé san muso fé*

cloth the -C buy woman the by
'The cloth is bought by the woman'
An interesting ambiguity arises with example b). The verb 
\textit{san} 'buy' is one which can take a directional adverb, 
having a surface structure identical to the passive.

\[
\begin{array}{c}
\text{NP} \left[ \left\{ \text{f\epsilon} \right\} \right] \\
\text{Adv} \left[ \text{b\text{olo}} \right] \text{pp} \text{Adv}
\end{array}
\]

and the meaning, 'from NP'. Sentence b) thus has two 
almost opposite meanings, 'The cloth was bought by the 
woman' or 'The cloth was bought from the woman.' It is
possible to have both the directional adverb and the agent
marker, e.g.

\textit{fini / san -ra muso / f\epsilon \ tye / f\epsilon}

\text{Adv \ Pass}

cloth the buy C woman the from man the by
'The cloth was bought from the woman by the man'

The two different means of generating the ambiguous sen-
tence accounts satisfactorily for its ambiguity.

c) \textit{donso ke \ ye dyara ' faga}

hunter man the C lion kill
'The hunter killed a lion'

\textit{dyara ' faga-ra donso ke \ b\text{olo}}

lion a kill C hunter man the hand
'A lion was killed by the hunter'
Returning to T-l, it is necessary to add another inherent feature to the verbal complex symbol referring to the manner in which they are nominalized. This feature can be stated as $[+/-li]$, $li$ being the suffix required by the nominalized verb. Both karan 'study' and nyina 'forget' are $[-li]$ verbs. Some examples of $[+li]$ verbs are as follows.

a)  **a yé Shift dumu**
    he C eat

    **a yé dumu -li \`ké**
    he C eat - ing the do
    'He ate'

b)  **a yé Shift faga**
    he C kill

    **a yé faga -li \`ké**
    he C kill -ing the do
    'He killed'

One more shifting rule can be set up which permutes intransitive verbs into subject position, replacing them with the Pro-verb \`ké. The structural description for the transformation is as follows:
T-2a

Shift , (Past) Asp , V , X

is transformed to:

\[
\begin{bmatrix}
V_N & \text{Art} \\
\end{bmatrix}, \ (\text{Past) Asp }, \begin{bmatrix} k \epsilon \\
\end{bmatrix}, X
\]

Some examples of this transformation are as follows:

a) Shift be se bara 'la

- C arrive work the at

se ' be k\epsilon \ bar a 'la

arriving the - C do work the at

'The work can be done'

b) Shift te-na ben u tye

Ant meet them among

neg

ben \ t\text{-na} k\epsilon \ u tye

meeting the do them among

neg

'They will not agree'
c) Shift té nyina u ko
    -C forget them back
    neg

nyina' té kɛ u ko
forgetting the -C them back
neg
'They will not be forgotten'

d) Shift ye wuli mansa ' kan
    C rise chief the on

wuli' kɛ-ra mansa ' kan
rising the do C chief the on
'A rising was made against the chief'

(The derived sentence in d) is also the result of T-5)
Chapter IV

Nominal Modification

As was pointed out in branching rules 2 and 3, there are two types of nominal modifiers which can be roughly classified as adjunctive as opposed to appositional. The appositional modifiers are derived from the optional embedded sentence dominated by noun phrase (Branching Rule 2). The adjunctive modifiers are derived from the embedded sentence dominated by the determiner (Branching Rule 3). There are numerous cases where a particular form may occur either as an adjunct or an apposition, but there are also cases where a form may only occur as an apposition, never as an adjunct. In all cases there are different rules which apply to the attachment of the appositional as opposed to the adjunctive forms to the noun phrase.

A. Relative Clauses

Relative clauses follow the same pattern for nominal modification, i.e. there are both adjunctive and appositional relative clauses.

The appositional relative clause in Bambara is similar in many respects to the English relative clauses. There is a matching of the antecedent noun phrase with a noun phrase in the embedded sentence and a subsequent replacement of the matched embedded noun phrase by the relative clause.
marker min. For example, the branching rules will produce the following P-marker.

\[
\begin{align*}
\text{tye} & \prec yé \left[ \text{muru} \right]_N \text{Art} \# \text{né} \quad yé \left[ \text{muru} \right]_N \text{Art} \# \text{san} \\
& \text{NP} \quad S- \quad \text{NP} \quad S- \quad \text{NP} \quad \text{VP}_1
\end{align*}
\]

The antecedent noun phrase muru is matched with the embedded noun phrase muru. After the matching, the relative clause marker min is attached to the embedded noun phrase node and the embedded noun phrase is erased, producing the following derived P-marker.

\[
\begin{align*}
\text{tye} & \prec yé \left[ \text{muru} \right]_N \# \text{né} \quad yé \left[ \text{min} \right]_N \quad yé \left[ \text{san} \right]_V \\
& \text{NP} \quad S- \quad \text{NP} \quad S- \quad \text{NP} \quad \text{VP}_1
\end{align*}
\]

In Bambara, the sentence,

\[
\text{tye} \prec yé \text{muru} \quad \text{né} \quad yé \text{min} \quad yé \text{san}
\]

man the C knife , I C which see buy

'The man bought the knife, the one which I saw' is acceptable as it stands, or the embedded appositional relative clause may be shifted to sentence final position, e.g.

\[
\text{tye} \prec yé \text{muru} \quad \text{san} / \quad \text{né} \quad yé \text{min} \quad yé
\]

man the C knife the buy , I C which see

'The man bought the knife, the one which I saw'

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In the Maninka of Kita (Dialect area II), Balenghien reports that the shift of appositional relative clauses to the rear of the sentence has become obligatory. The problems that arise from treating this shift as obligatory are acute. In theory, one must allow every noun to be optionally modified by an appositional relative clause. If, however, the appositional relative clause is obligatorily shifted to the rear of the sentence, one is constrained to using only one appositional relative clause per sentence. In addition, the ambiguities that arise when the relative clause is shifted to the rear of the sentence can be so troublesome that speakers generally will prefer a reconstruction of the entire sentence. For example, when there is only one noun in the base sentence, no problems arise, e.g.

\[ tye \ t\, t\, g\, a\, -\, r\, a \ \ \, S\, \, \, d\, \, e\, \, d\, \, u\, \, y\, \, e\, \, m\, \, i\, n\, \, d\, \, o\, n \]

'\text{The man went, the one that Seydou knows}'

When the appositional relative clause is rear shifted when there is an object noun and/or a complement noun present, ambiguities arise, e.g.

\[ tye \, y\, e\, f\, i\, n\, i\, \, s\, a\, n\, m\, u\, s\, o\, \, f\, e\, , \, n\, e\, y\, e\, m\, i\, n\, y\, e\, k\, u\, n\, u \]

'\text{The man bought the cloth from the woman, the one I saw yesterday}'}
The shifted relative clause can refer to either *tye* 'man', *fini* 'cloth' or *muso* 'woman'.

In addition, in Maninka only one appositional relative clause actually occurs per base sentence. In Bambara, there can be any number of appositional relative clauses, but only one can be rear shifted. In order to find the most general set of rules which will account for the dialectal differences as well as distinguishing between competence and performance, the rules have been structured as follows. All noun phrases may be followed by an appositional relative clause at the level of competence. Appositional relative clauses may then be optionally rear shifted with the condition that there is no intervening relative clause in the following portions of the sentence.

The transformational rules for the embedding of appositional relative clauses are as follows:

T-6

\[ SD: \text{N D, NUM, #, N D, Num, Y, #} \]
\[ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \]

\[ SC: \text{N D, Num, /, X, min, Num, Y} \]
\[ 1 \ 2 \ 4 \ 6 \ 7 \]

Condition: 1=5
2=6
Some additional examples of appositional relative clauses are as follows:

a) né yé muso \ yé, i ni mín bɔ - len nyəgon \ fe

I see, you and which come out - ed parallel the by

'I saw the woman who looked like you'

The shifting rule which has applied in the above example is as follows:

T-7 optional (obligatory in dialect II)

SC: $X, /S, Y, \# \Rightarrow X, Y, /S, \#$

1 2 3 4 \Rightarrow 1 3 2 4

Condition: Y does not contain mín

b) muso dɔ , mín sé-ra kúnu yé a fo

woman certain, which arrive C yesterday C it say

'A certain woman, the one who arrived yesterday, said it'

Example b) after the operation of T-7 becomes

c) muso dɔ yé a fo , mín sé-ra kúnu

woman certain C it say, which arrive C yesterday

'A certain woman said it, the one who arrived yesterday'
Adjunctive relative clauses

Adjunctive relative clauses are derived from the embedded sentence dominated by the determiner Branching Rule 3). There are a number of important differences between the two types of relative constructions.

1) In the first place, there is no restriction concerning the nature of the article in the formation of appositional relative clauses, i.e. the modified noun in the base sentence may be definite or indefinite. With adjunctive relative clauses, the article must be definite.

2) In the second place, in the formation of the appositional relative clause, after the matching of the modified noun phrase with a noun phrase in the embedded sentence, the embedded noun phrase is replaced by min. With the adjunctive relative clause, after the matching of the two noun phrases, the relative clause marker min replaces the definite article in the embedded sentence and the antecedent noun in the base sentence is deleted. Finally, after the embedding of the adjunctive relative clause into the base sentence, it may be optionally front shifted whereas the appositional relative clause is rear shifted. The noun phrase position from which the embedded relative clause was shifted is subsequently filled by the pronoun ə 'that one, the latter.'
Again, Balenghien reports in an oral communication that in the Maninka of Kita, the front shifting of adjunc-
tive relative clauses is obligatory. The same phenomenon was noted in research done on the Maninka of Guinee
(Dialect area IV) and in the Dyula of the Ivory Coast (Dialect area VIII). If the front shifting is indeed
obligatory, the same problem arises as with the apposi-
tional relative clauses, i.e. one can have only one adjunc-
tive relative clause per base sentence. In the Bambara
dialects which are the concern of this study, the front
shifting is optional. There are many cases where the rela-
tive clause is left nested in the base sentence. This also
permits that any noun in the base sentence may be modified
by an adjunctive relative clause, only the first of which
may be front shifted. At the level of performance, the
Bambara speakers prefer sentences in which there is only
one adjunctive relative clause per base sentence and they
equally prefer the front shifted form. In a performance
test with a group of Malian English teachers when asked to translate into Bambara the English sentence

'The man that I saw sells the cloth that I like'

the great majority restructured the dependencies so that
there would be only one relative clause per base sentence,
e.g.
'I like the cloth that the man that I saw sells'
or in Bambara,

né ye tyé min yé, o bé fini min fere, o ká dí né yé

I C man wh- see, that one -C cloth wh- sell, that one is

nice to me

In the above sentence, né ye tyé \ yé 'I saw the man' is
embedded into the sentence tye \ bé fini \ fere 'The man
sells the cloth' which is in turn embedded into the sen-
tence, fini \ ká dí né yé 'The cloth is nice to me'. When
this restructuring was pointed out to them, the native
speakers produced the sentence,

né ye tyé min yé, o bé fini min ká dí né yé san

I C man wh- see, that one -C cloth wh- is nice to me

sell

in which both the sentences né ye tyé \ yé, 'I saw the man'
and fini \ ká dí né yé 'The cloth is nice to me' are
embedded into the base sentence, tye \ bé fini \ san,
'The man sells the cloth'. The first embedded sentence
has been front shifted and the second is nested in the
base sentence.

It is difficult to say at this point whether the multi-
ple nesting of relative clauses should be permissible at
the level of competence. Native speakers do not produce
such sentences and when confronted with one do not
hesitate to reject it. For example, the sentence

\[
a \text{ye muso min be fini min ka di ne ye fere furu}
\]

he C woman wh- -C cloth wh- is nice me to sell marry

'He married the woman who sells the cloth that I like'

in which there is multiple nesting of relative clauses is unacceptable to native speakers. Whether the sentence is unacceptable at the level of competence or of performance is not decidable at present. The rule applying to the front shifting of relative clauses will be obligatory when the relative clause dominates another relative clause. The above sentence thus becomes:

\[
\text{muso min be fini min ka di ne ye fere a ye o furu}
\]

woman wh- -C cloth wh- is nice me to sell, he C that one marry

'He married the woman who sells the cloth that I like'

The nested relative clause may now be optionally front shifted to produce:

\[
\text{fini min ka di ne ye, muso min be o fere, a ye o furu}
\]

cloth wh- is nice me to, woman wh- -C that sell, he C that marry

'He married the woman who sells the cloth that I like'
The transformational rules which formally describe the embedding and front-shifting of adjunctive relative clauses are as follows:

**SD:**

\[
X, [N_{NP} (Adj), \#_{5}, Y, N_{D \rightarrow D}, Num_{Z}, \#], Num_{NP}, Q
\]

1 2 3 4 5 6 7 8 9 10

**SC:**

\[
X \left[ \left[ S_{NP} Y_{NP} (Adj)_{D} \right. \left[ min_{D} \right] Num_{Z_{NP}}, ]_{NP} \right] Q
\]

1 4 5 7 10

Condition: \(2 = 5\)

The noun rule erases the antecedent noun and adjective (2), erases the sentence boundaries (3 and 8), replaces the embedded definite article (6) with the relative clause marker \(\text{min}\) and erases the definite article and number marker of the antecedent noun phrase (9). In addition, the transformation shifts the adjunctive relative clause from an immediate domination by the determiner.
to an immediate domination by the noun phrase.

Some examples of adjunctive relative clauses are as follows:

1. a) muso → # Sédù be-na muso → furu
   \ka só → \ka bon
   woman the #Sedu will woman the marry# the of house
   the is big
   becomes
   b) Sédù bé-na muso min furu \ka só → \ka bon
   Sedu will woman wh-married of house the is big
   'The house of the woman that Seydou will marry is big'

2. a) tye\vé so # né vé so \vé # \san
   man the C horse # I C horse the see # the buy
   becomes
   b) tye \vé né vé so min vé san
   man the C I C horse wh-see buy

3. a) tile \ tun \ka gban tuma # u sé-ra dugu \kon\ tuma\ 
    \lá # \lá
   sun the past is hot time # they arrive C town the
   in time the at # the at
   becomes
   b) tile \ tun \ka gban u sé-ra dugu \tuma min \lá
   sun the past is hot they arrive C town the in time
   wh- at

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'The sun was hot at the time that they arrived.'

4. a) a bé yọ̀rọ́ # né tum bé yọ̀rọ́ ìlà kùnù # ìlà
he is place # I past am place the at yesterday #
the at

becomes

b) a bé né tum bé yọ̀rọ́ min ìlà kùnù
he is I past am place wh- at yesterday

'He is at the place where I was yesterday'

**T-9 Adjunctive Relative Front-shifting**

A. Obligatory

**SD:** $\left[ \begin{array}{c} \#, \ X, \left[ Y \ N \ (Adj) \ min \ Z \right], \ Q \end{array} \right]$

$\begin{array}{ccc} S & S & S \\ NP & NP & S \\ 1 & 2 & 3 \end{array}$

**SC:** $\left[ \begin{array}{c} \#, \left[ Y \ N \ (Adj) \ min \ Z \right], \ X \left[ o \ NP \right], \ Q \end{array} \right]$

$\begin{array}{ccc} S & S & S \\ S & S & S \end{array}$

Conditions: 1. $Y$ and/or $Z$ contains $N \ (Adj) \ min$

2. $X$ does not contain $N \ (Adj) \ min$

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The rule T-9 shifts the embedded adjunctive relative clause (3) to sentence initial position attaching it directly to the sentence node and fills the empty noun phrase position with the pronoun o. This rule is obligatory when there is a relative clause embedded within the relative clause as stated in Condition 1. The rule cannot however operate if there is already a relative clause shifted into initial position as stated in Condition 2.

T-9 B, optional

This rule is exactly the same as T-9A with the exception of the condition 1.

5. a) né vén té. # té
  ñe sô # sô
  bé ségu dyô # u don
  I C man # man the -s -C house # house the -C Segu#
  the build # the -s know
  becomes obligatorily
  b) té min ñe sô min bé Ségu dyô, né vén o don
  man wh- -s -C house wh- is Segou build, I C that one
  know
  'I know the men who are building the house which is
  in Segou'
  example b) becomes optionally
  c) sô min bé Ségu, té min ñe o dyô, né vén o don
  house wh- is Segu, man wh- -s -C that build, I C
  that know
  'I know the men who are building the house which is
  in Segou'
Examples 1 through 4 with optional front shifting are as follows:

1  c) **Sédu bé-na muso min furu, o ká só\'ká bon**  
   Seydou will woman wh- marry, that of house the is  
   big  
   'The house of the woman that Seydou will marry is  
   big'

2  c) **né yé só min yé, tyë\'yé o san**  
   I C horse wh- see, man the C it buy  
   'The man bought the horse that I saw'

3  c) **u sé-ra dugu\'komp tuma min lá, tile \' tum ká gban**  
   they arrive C town the in time wh- at, sun the past  
   is hot  
   'The sun was hot at the time that they arrived'

4  c) **né tum bé vọrọ min lá kúnu, a be yen**  
   I past am place wh- at yesterday, he is there  
   'He is at the place where I was yesterday'

B. Adjectives

There are both appositional and adjunctive adjectives  
which are derived from the same embedded sentences dis-  
cussed in the preceding section on the relative clause.  
The rules which apply to the embedding of relative clauses  
and to the formation of adjectival modifiers may be con-  
sidered bracketed, i.e. whether one chooses to use an
adjective or a relative clause to modify the noun is optional given a structural description which satisfies both transformations.

**Adjunctive Adjectives**

The major characteristics of the adjunctive adjectives is that they are attached directly to the noun and followed by the article and number marker. The tone of adjunctive adjectives is predictable in terms of the noun to which they are attached as will be demonstrated in the tone rules in the next chapter. There are a great number of adjectival formation rules, only a few of which will be discussed here. All adjectives that can operate as adjunctive adjectives may also operate as appositional adjectives, but the converse is not true.

**T-8a**

SD:

\[
\left[ \begin{array}{c}
N \text{ (Adj)}, \# & N \text{ (Adj)}, \text{Art}, \text{Num}, \text{Asp}, V^{\text{neg}}, V, \# \text{Art}, \text{Num} \\
\text{NP} & \text{NP}
\end{array} \right]
\]

1 2 3 4 5 6 7 8 9 10

SC:

\[
\left[ \begin{array}{c}
N \text{ (Adj)}, V, \text{man}, \text{Art}, \text{Num} \\
\text{NP} & \text{NP}
\end{array} \right]
\]

1 7 9 10
The above transformation matches the noun and adjective of the base sentence (1) with that of the embedded sentence (3), erasing the latter. Similarly the number marker in the embedded sentence (4) is erased after matching with that of the base sentence (9). The aspect marker with the feature [- negative] (5) is also erased, leaving only the adjectival verb (6) in the embedded sentence, to which is attached the suffix -man. A more delicate classification of adjectival verbs is required in which the feature [+/- -man] delete is added to the verbal matrix. This feature would refer to an optional transformation in which the suffix could be deleted.

Examples of this transformation are as follows:

1 a) a ye bara # bara \ká gbelen # \ké  
    he C work # work the is difficult # the do  
    becomes  
1 b) a yé bara gbelen-man \ké  
    he C work difficult the do  
    'He did the difficult work'

2 a) muso \vé dön-kili # dön-kili\u ká nyi # \u da  
    woman the C song # song the -s is good # the -s put down  
    becomes  
2 b) muso \vé dön kili nyi-man \u da  
    woman the C song good the -s put down  
    'The woman sang the good songs'
3 a) daga ba # daga ba \text{\textasciitilde}ká fin # bé só kere \text{\textasciitilde} fe
pot big # pot big the is black # is house side the
becomes
3 b) daga ba fin -man \text{\textasciitilde}bé só kere \text{\textasciitilde} fe
pot big black the is house side the by
'The big black pot is by the side of the house'

It is to be noted that the contrast between definite and
indefinite articles occurs after the noun plus adjective
construction, e.g.

\begin{verbatim}
 a ye muso nyi -man \text{\textasciitilde}furu
he C woman good the marry
'He married the good woman'

 a ye muso nyi -man \text{\textasciitilde}furu
he C woman good a marry
'He married a certain good woman'
\end{verbatim}

\textbf{T-8b} ( verb + -ta )

SD:

\begin{verbatim}
[ N (Adj), #, N (Adj), Art, Num, Asp, V, #, Art, Num ]
NP  S_  -comp _-neg  S_  NP
  1  2  3  4  5  6  7  8  9  10

SC: [ N (Adj), [ V -ta ] , Art , Num ]
NP  S_  S_  NP
  1  7  9  10
\end{verbatim}

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The above transformation matches the noun and adjective of the base sentence (1) with that of the embedded sentence (3), erasing the latter. The embedded number marker (5) is erased in similar fashion. The embedded article (4) and the aspect marker with the feature [-completive] (6) and the sentence boundaries (2 and 8) are also erased. The only item left in the embedded sentence is the verb (7) to which is attached the suffix -ta.

Examples of T-8b are as follows:

4 a) a té tys. # tye\^ be sa # \ ye
   he -C man # man the -C die # the as
   neg

becomes

4 b) a té tys sa - ta \ ye
   he -C man die - able the as
   neg

'He is not a mortal man'

5 a) a bé daga # daga \ u bé san # \ u ta
   she -C pot # pot the -s -C buy # the -s carry

becomes

5 b) a bé daga san -ta \ u ta
   she -C pot buy - able the -s carry

'She is carrying the pots for sale'

Example 5) gives another illustration that the transformations must be ordered, since the embedded sentence is itself derived by the object shifting rule T-2.
The above transformation matches the base noun and adjective (1) with its embedded counterpart (3) deleting the latter. In a similar fashion the embedded number marker (5) is erased. The article (4), the sentence boundaries (2 and 8) and the aspect marker with the feature [+ negative] are erased, leaving only the optional noun phrase and verb (7) as units in the embedded sentence. The suffix \textit{-bali} is attached to the verb.

Examples:

6 a) \textit{né ye tye} # \textit{tye} \{\textit{tē mā}\} \textit{misi} \textit{faga} # \textit{don}

I C man # man the \{C neg\} cow the kill # a know \{C neg\}
becomes

6 b) né yé tye'misi faga -balî' don

I C man cow kill -less a know

'I know a certain man who {does not kill} cows'

In the above example the transformation neutralizes the contrast between completive and non-completive aspect markers which accounts for the two possible interpretations.

7 a) né yé fini # fini\te' san # yé

I C cloth # cloth the-C buy # the see

neg

becomes

7 b) né yé fini san -balî\yé

I C cloth buy -less the see

'I saw the cloth which was not for sale'

Rules T-8a through T-8c may be combined in one bracketed rule as follows:

SD:

\[
\begin{array}{c}
\text{Asp, V} \\
\text{-neg, adj} \\
\text{Asp, V} \\
\text{-comp, neg} \\
\text{Asp, (NP) V} \\
\text{+neg}
\end{array}
\]

N (Adj), #, N(Adj), Art, Num,

1 2 3 4 5 6 7 8 9 10
Appositional Adjectives

Since, as stated above, all adjunctive derived adjectives can also occur as appositions, rather than repeat exactly the same rules for the derivation of these forms, it has been decided to have an optional shifting rule which moves an adjective from an adjunctive position to an appositional position. This decision has additional semantic support since there is no discernible difference in meaning between an appositional and an adjunctive adjective.

**T-9 Adjunctive to Apposition Shifting Rule**

**SD:** \[ N \text{(Adj)}, S, \text{Art}, \text{Num} \Rightarrow N \text{(Adj)}, \text{Art}, \text{Num}, S, \text{Art} \]

\[
\begin{array}{cccc}
1 & 2 & 3 & 4 \\
\Rightarrow & 1 & 3 & 4 & 2 & 4
\end{array}
\]

The rule T-9, shifts the adjunctive adjective \((2)\) to a position following the article \((3)\) and the number marker \((4)\), and at the same time spreads the article to a position following the now appositional adjective.

**Examples:**
1) a yé muso nyi-man`furu [--- --- --- ---]
   he C woman good the marry
   'He married the good woman'

becomes optionally

2) a yé muso nyi-man`furu [--- --- --- ---]
   He C woman the good the marry
   'He married the woman, the good one'

3) a yé daga dyí-ma`ta [--- --- --- ---]
   he C pot water -y the carry
   'He carried the pot with water in it'

becomes optionally

4) a yé daga dyí-ma`ta [--- --- --- ---]
   She C pot the water -y carry
   'She carries the pot with water in it'

5) a yé daga dyí-ma`ta [--- --- ---]
   She C pot water-y a carry
   'She carried a certain water-filled pot'

becomes optionally

6) a yé daga dyí-ma `ta [--- --- ---]
   She C pot a water-y a carry
   'She carried a pot, water filled'

   It is to be noted that the tonal rules neutralize the contrast between 5) and 6). There are thus only three differing phonological patterns to represent four syntactic contrasts.
The only appositional modifier that cannot occur also as an adjunctive modifier is the form roughly equivalent to the English present participle. This form differs also from the other appositional modifiers in that there is no agreement or concordance with the tonal articles. The only article with the present participial form occurs between the noun and the participle.

\[ T-10 \ (NP) \ V \ -to \ (present \ participle) \]

\[ SD: \left[ \begin{array}{c} \text{N} X \text{,} \text{NP} \ S \text{,} \text{Y} \text{,} \ (NP) \ V \ -to \ (do) \text{,} \text{Asp} \ S \text{,} \text{NP} \end{array} \right] \]

\[ 1 \ 2 \ 3 \ 4 \ 5 \]

\[ SC: \left[ \begin{array}{c} \text{N} X \text{,} \text{NP} \text{,} \ (NP) \ V \ -to \text{,} \text{NP} \end{array} \right] \]

\[ 1 \ 4 \]

Condition: \( 1 = 3 \)

The above transformation matches the base noun and following modifiers (1) with the embedded noun and modifiers (3), erasing the latter. The sentence boundaries (2 and 6) and the aspect marker (4) are also deleted.

**Examples**

1a) \( n'\ y\ e \ y\ ty\ e \ u \ # \ t\ y\ e \ ' u \ dy'i\ i\ t\ i\ g\ e \ -to \ do \ # \ fo \)

I C man the -s # man the -s tree the cut-ing is #

great
becomes

1b) **ne ye ty u dyiri tig -t fo**

I C man the -s tree the cut -ing greet

'I greeted the men cutting trees'

2a) **ty # ty sigi - t do # ve a f**

man a # man a sit -ing is # C it say

becomes

2b) **ty sigi - t ye a f**

man a sit -ing C it say

'A certain man (in the act of) sitting down said it'
Chapter V

Tone Rules

Welmers, in an article entitled 'Tonemes and Tone Writing in Maninka' (Welmers, 1949) outlined the major characteristics of phonemic tone in isolated words and short utterances. Welmers' findings have been largely confirmed in subsequent analyses by Stevick (1963), Spears (1965), and Bird (1966). The major points brought out by Welmers' study are:

1. There are two contrasting tones which are called high as opposed to low.

2. The scope of phonemic tone is not the syllable as in most tone languages, but a larger unit, which shall be called in this chapter, the word. The word is that unit which occurs between the juncture symbols (+).

3. Low tone words in certain contexts have an alternant form with a rising pitch. This context was stated by Welmers as being a following low tone word. When followed by high tone words, low tone words have a low level pitch.

Subsequent studies on Bambara grammar revealed that there is a definite article or specific marker, the primary manifestation of which in the surface structure of
sentences is only tonal. In the Bambara dialects that are
the object of this study, if a low tone noun is marked with
the definite article, it will have a rising pitch and, if
followed by a high tone word, the latter will have a
stepped down pitch. If a high tone noun is marked with the
definite article, a following high word noun will have a
stepped down pitch level, i.e. it will occur on a pitch
level lower than the preceding high tone noun. Since the
rising of low tone words and the stepping down of high tone
words are both phenomena conditioned by low tone, the
definite article or specific marker is thus justifiably
analysed as a low tone in the deep structure. If a high
or low tone noun is marked with the indefinite, a follow­
ing low tone word will have a high falling pitch pattern.
For this reason, the indefinite article has been repre­
sented as a high tone in the deep structure. This parti­
cular manifestation of the indefinite article has only been
found in the Bambara dialects which are the concern of this
study. In dialect area VIII, and in the trade dialects
spoken in the major cities, when a low tone noun is marked
for indefinite and is followed by a low tone word, the
indefinite article is represented by the morpheme doo, as
described in Bird (1966). In dialect area I, as described
by Rowlands, the definite article is represented by the
morpheme o .
In addition to the effects of the determiners which must be accounted for in an adequate analysis of Bambara sentence pitch patterns, a slight modification of Point 3 brought out by Welmers is required. There are cases where low tone words do not have rising intonation when followed by low tone words, e.g.

\[ \text{a ye } \text{deni } \text{\textbackslash ta } \text{bi} \]

he C load the carry today \[ \text{- - - -} \]

'He carried the load today'  

In the above example, \text{ta} 'carry' is a low tone verb, but it does not have rising pitch before the low tone word \text{bi} 'today'. In fact the pitch of \text{ta} is exactly the same as that of a stepped-down high tone verb, such as \text{bo} 'take/go out' in the following example.

\[ \text{a ye } \text{deni } \text{\textbackslash bo } \text{bi} \]

He C load the took out today \[ \text{- - - -} \]

'He took the load out today'  

In the present analysis, this neutralization is handled by the stepping-up rule P-9, which shifts non-lengthened monosyllabic rising words to a stepped-up pitch.

The rules in this chapter are those which are necessary for converting the abstract two tone phonemic contrast of high vs. low into a more narrow specification of the sentence pitch pattern. One of the major functions
of such phonetic rules in general is to take discrete phonemic contrasts and convert them into gradient phonetic specifications. There are many degrees of delicacy in which these gradient specifications for pitch can be stated, such as, for example, in terms of absolute pitch, cycles per second. The set of rules set out in this chapter is still at the level of relative pitch. In theory, the relative levels of pitch established by these rules can be converted by a more delicate set of rules which in addition to assigning cycles per second to the pitch levels would also treat the transitions from one pitch level and account for voiced and voiceless consonants, nasals and other phonetic phenomena which have an indirect effect on the sentence pitch pattern.

In order to facilitate the exposition of the tone rules, low tone, which in the preceding sections has been marked with grave accent only when used as a determiner, will now be marked on all words with low tone by the capital letter, L, preceding the word, e.g.

\[ \text{L} \text{muso} \quad \text{woman}' \]
\[ \text{L} \text{so} \quad \text{horse}' \]

Likewise, high tone which has been represented by an acute accent over the first vowel of high tone words will now be represented by the capital letter, H, before the word, e.g.
A plus sign (+) will be used in place of the concatenation symbol (∼) used in the branching rules. The symbols C and V stand for the features consonantal and vocalic, respectively, and will represent the structure of the syllable. The symbol CVCV will represent poly- as well as bisyllabic words, the last CV of the sequence, being the last syllable of polysyllabic words. The symbol CV(CV) represents a mono- or polysyllabic word.

**Morphophonemic Rules**

The following rules are those which require grammatical information in the structural description for the transformation.

**TR-1 Noun compounds and Noun + Adjective stem tone erasure**

\[
\begin{aligned}
&\{H\} \\
&\{L\}
\end{aligned}
\]

**SD:** N X + , , CV (CV) + Y + Art + Num

1 2 3

**SC:** N X + , CV (CV) + Y + Art + Num

1 3

Conditions: X and Y do not contain Art(icle). This constraint disallows the rule from operating on embedded relative clauses and sequences.
of noun phrases.

Y is not null, i.e. Y must contain at least one word. This constraint is to assure that the rule does not operate on the last noun before the article.

Tone Rule 1 states that any word following the initial noun of the noun phrase loses its stem tone if it is not immediately preceding the article. The rule is in effect constrained to operate only on noun compounds and noun plus adjunctive adjective constructions.

Examples:

1 a)  
\[ \text{L\text{daga} + L\text{fin-man} + L\text{nyi-man} + H\text{ba} + \text{L} +} \]
\[ \text{pot} \quad \text{black} \quad \text{good} \quad \text{big} \quad \text{the} \]
becomes after two operations of the rule

1 b)  
\[ \text{L\text{daga} + fin-man + nyi-man + H\text{ba} + \text{L} +} \]
\[ \text{pot} \quad \text{black} \quad \text{good} \quad \text{big} \quad \text{the} \]

\[ \text{The big good black pot} \quad [\text{--- --- ---}] \]

2 a)  
\[ \text{H\text{dyi} + L\text{daga} + H\text{gbiri-man} + \text{L} +} \]
\[ \text{water} \quad \text{pot} \quad \text{heavy} \]
becomes after one operation of the rule

2 b)  
\[ \text{H\text{dyi} + daga + LH\text{gbiri-man} + \text{L} +} \]
\[ \text{water} \quad \text{pot} \quad \text{heavy} \]

\[ \text{The heavy water pot} \quad [\text{--- --- ---}] \]
The above rule replaces the low tone (2) of the word preceding the article when the word is not at the same time the first word of the noun phrase. The effect of this rule is that in all noun compounds and noun plus adjective constructions, the last unit will have high tone. With the change of low tone to high tone a number of interesting ambiguities arise, e.g.

3 a) \[ \text{kongo} + H \text{la} + L \text{so} + L \]
   bush in horse the
   becomes after the operations of TR 1 and 2:

3 b) \[ \text{kongo} + L \text{la} + H \text{so} + L \]
   'the horse in the bush' \[ \begin{array}{c} \hline \hline \hline \hline \end{array} \]

The contrast between the minimal pair \[ \text{so} \text{ 'horse'} \] and \[ \text{ho} \text{ 'house'} \] is effectively neutralized by TR-2. The phrase 'house in the bush' has thus a surface structure identical to 3b).
The next set of rules reduces the abstract phonemic contrast of high (H) vs. low (L) to a more delicate description of the pitch sequences of the sentence.

P-1 Indefinite article and low tone word

\[
X +, H +, \left[ \frac{L CV}{L CV CV} \right] \Rightarrow X +, \left[ \frac{H + L CV}{H CV L CV} \right]
\]

The rule P-1 states that when a low toned monosyllable or a low tone polysyllable (3) are preceded by the high tone indefinite article (2), the low tone monosyllable becomes a high falling tone, represented by H + L, and the polysyllable becomes a sequence of high first syllable followed by low, e.g.

1 a) \[ L a + H ye + H dyiri + H + L tig \]

becomes

1 b) \[ L a + H ye + H dyiri + H tig L g \]

he C tree a cut

'He cut a tree'

2 a) \[ L a + H ye + L so + H + L san \]

becomes
2 b) \( L_a + H_v + Lso + H + L \) san

\[ \text{he C horse buy} \]

'He bought a horse''

3 a) \( L_{muso} + H + L_{kor} + L_+ L_{na-ra} \)

\[ \text{becomes} \]

3 b) \( L_{muso} + H_ko L_{ro} + L + L_{na-ra} \)

woman a older sib the come C

'The older sib of a woman came'

P-2 low rise before low

\[ \left\{ \begin{array}{c}
L_{CV} \\
L_{CVCV}
\end{array} \right\} + L \xrightarrow{\#} \left\{ \begin{array}{c}
L + H \\
L_{CV} H\end{array} \right\} , + L \]

1 2 3 1 3

P-2 states that a low tone monosyllabic word and a low tone polysyllabic word when followed by a low tone become respectively a low to high rise, symbolized by \( L + H \); and a low tone initial syllable, followed by a final high tone syllable, e.g.

4 a) \# \( L_{so} + L + H \) be + \( L_{van} \)

1 2 3

becomes
4 b) \[ \text{horse the is here} \]

5 a) \[ \text{becomes} \]

5 b) \[ \text{'I saw a certain woman'} \]

6 a) \[ \text{becomes after two operations of the rule} \]

6 b) \[ \text{'The older sib of the woman came'} \]

Some of the rising pitches produced by this rule will be further modified in Rule 13.

P-3 First high tone equals peak pitch

\[ \# X,^H \quad \Rightarrow \quad \# X,^{PP} \]

\[ \text{Condition: } X \text{ does not contain } ^H (a \text{ high tone}) \]
P-3 states that the first high tone after the sentence boundary will be rewritten as PP (peak pitch). Note that this rule also will apply to high tones assigned by rules P-1 and P-2.

7a) \[ \text{woman the come C} \]

'bThe woman came'

becomes

7b) \[ \text{'The woman came'} \]

8a) \[ \text{tree the cut C} \]

'bThe tree has been cut'

becomes

8b) \[ \text{'The tree has been cut'} \]

9a) \[ \text{horse the is here} \]

'bThe horse is here'

becomes

9b) \[ \text{'The horse is here'} \]

P-4 high tone step up after low

\[
\begin{align*}
&L (CV (CV)) (+), H^, X \Rightarrow L (CV (CV)) (+), PT + 1, X \\
&1 \quad 2 \quad 3 \quad 1 \quad 3
\end{align*}
\]
P-4 states that any high tone after low is to be rewritten as the preceding (low) tone plus one (PT + 1).
Note that this no longer refers to high tones previously rewritten by P-3, e.g.

10a) \[ PP_{ne} + H_{ye} + L_{so} + L_{H\ ye} \]

\[ 1 \quad 2 \quad 3 \]

becomes after two operations of P-4

10b) \[ PP_{ne} + H_{ye} + L_{PT+1_{so}} + L_{PT+1\ ye} \]

\[ 1 \quad C \quad \text{horse the see} \]

'I saw the horse' \[ \overline{---\ /---} \]

11a) \[ L_{a_{ + PP\ ye}} + L_{mu\ H_{so}} + L_{L\ furu} \]

\[ 1 \quad 2 \quad 3 \]

becomes

11b) \[ L_{a_{ + PP\ ye}} + L_{mu\ PT+1_{so}} + L_{L\ furu} \]

\[ 1 \quad C \quad \text{woman the marry} \]

'He married the woman' \[ \overline{---\ ---\ ---} \]

P-5 low tone drop after non-low

\[
\begin{align*}
\begin{cases}
H_{PT+1} \\
PP_{}\end{cases} & \text{ CV } \ (CV) \ (+), \ Y \ \Rightarrow \begin{cases}
H_{PT+1} \\
PP_{}\end{cases} \text{ CV } \ (CV)(+), \ PT-2, \ Y \\
1 & 2 & 3 & 1 & 3
\end{align*}
\]

P-5 states that a low tone (2) is to be rewritten as preceding tone minus two (PT-2) when preceded by a high tone or a high tone already rewritten as PT + 1 or PP.
It is rule P-5 in conjunction with P-4 that accounts for the downdrift characteristic of Bambara intonation patterns, i.e. the high tones rise only one degree whereas the low tones drop two degrees. It is also to be noted that when the rule is applied to a low tone determiner, which is followed by a high tone word, it has the effect of a step-down on that high tone word. In this sense Bambara could be described as a terrace level language, as first noted by Stevick (1963).

12a) \( L_{\text{mu}} PP \text{ so } + L + PT + 1 \text{ kunu-ra} \) becomes

\[
\begin{array}{ccc}
1 & 2 & 3 \\
\end{array}
\]

12b) \( L_{\text{mu}} PP \text{ so } + PT-2 + P_{\text{h}} \text{ kunu-ra} \) \([- - - - -]\)

woman the awaken C

'The woman awakened'

13a) \( L_{\text{mu}} PP \text{ so } + L + L \text{ kunu-ra} \) becomes

13b) \( L_{\text{mu}} PP \text{ so } + PT-2 + L \text{ kunu-ra} \) \([- - - - -]\)

woman the swallow C

'The woman was swallowed'

It is to be noted that after the operation of the rules which follow, the only contrast between 12b) and 13b) will be one of interval between the last syllable of muso 'woman' and the following verbs, kunu 'awaken' and kunu 'swallow'.

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becomes after two operations of P-5:

\[ \begin{array}{c}
14b) \frac{L + PP}{so + PT-2 + PT+1} \frac{be}{be + PT-2} \frac{yan}{yan} \\
\end{array} \]

P-6 initial low tone

\[ \begin{array}{c}
# > \text{X} \quad # \text{PP-2} \quad \text{X} \\
1 \quad 2 \quad 3 \\
1 \quad 3 \\
\end{array} \]

P-6 states that the initial low tone is to be rewritten as peak pitch minus two (PP-2), e.g.

\[ \begin{array}{c}
15a) \frac{L}{muso} + PP + H \frac{be}{be} + PT-2 \frac{yan}{yan} \quad [\overline{\phantom{-}}] \\
1 \quad 2 \quad 3 \\
\end{array} \]

time for something to start

becomes

\[ \begin{array}{c}
15b) \frac{PP-2}{muso} + PP + H \frac{be}{be} + PT-2 \frac{yan}{yan} \quad [\overline{\phantom{-}}] \\
\text{woman a is here} \\
'A woman is here' \\
\end{array} \]

\[ \begin{array}{c}
16a) \frac{L}{mu} PP + PT-2 + PT+1 \frac{be}{be} + PT-2 \frac{yan}{yan} \quad [\overline{\phantom{-}}] \\
1 \quad 2 \quad 3 \\
\end{array} \]

becomes

\[ \begin{array}{c}
16b) \frac{PP-2}{mu} PP + PT-2 + PT+1 \frac{be}{be} + PT-2 \frac{yan}{yan} \\
\text{woman the is here} \\
[\overline{\phantom{-}}] \\
\end{array} \]

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17a) \[ \# \frac{L + PP}{1} \text{so} + \frac{PT-2 + PT+1}{2} \text{be} + \frac{PT-2}{3} \text{yan} \]

becomes

17b) \[ \# \frac{PP-2 + PP}{1} \text{so} + \frac{PT-2 + PT+1}{2} \text{be} + \frac{PT-2}{3} \text{yan} \]

horse the is here

'The horse is here' [\(\ldots\)]

P-7 Sentence final monosyllabic high tone

\[ \left\{ \frac{PT}{PT + 1} \right\}_{CV} \Rightarrow \left\{ \frac{PT}{PT + 1} \right\}, \text{Fall to } \emptyset \]

A sentence final monosyllabic high tone word will form the pitch level assigned to it to the bottom of the pitch register (Fall to \(\emptyset\)). The only high tone word that does not appear to have a sentence final fall is the emphatic marker \(\ddot{e}\), which maintains the pitch level and is frequently followed by a glottal stop.

P-8 Sentence final polysyllabic high tone

\[ \left\{ \frac{H}{PT + 1} \right\}_{CVCV} \Rightarrow \left\{ \frac{H}{PT + 1} \right\}_{CV}, \text{PT + Fall to } \emptyset \]

With a polysyllabic high tone word in sentence final position, the final syllable will fall from preceding tone to the bottom of the pitch register.

18a) \[ \underline{PP-2} a + \underline{PP} \text{be} + \underline{H} \text{taga} \]

becomes
P-9 Sentence final monosyllabic low

\[
\{L_{PT-2}\}_{CV} \# \Rightarrow \{L_{PT-2}\} + \text{Fall to } \emptyset \{CV\} \#
\]

A sentence final monosyllabic low tone word will, as its high tone counterpart, fall to the bottom of the pitch register, e.g.

19a) \(PP-2 a + PP \text{ be} + PP-2 \text{ yan}\) becomes

19b) \(PP-2 a + PP \text{ be} + PP-2 + \text{Fall to } \emptyset \text{ yan} \) \[\left[\begin{array}{c}
- \\
- \\
\end{array}\right]\]

he is here

P-10 Sentence final polysyllabic low

\[
PT-2_{CVCV} \# \Rightarrow PT-2_{CV} \text{ PT}+1 + \text{Fall to } \emptyset \{CV\} \#
\]

The last syllable of a polysyllabic low tone word in sentence final position will rise and then fall to the bottom of the pitch register, e.g.

20a) \(PP-2 a + PP \text{ be} + PT-2 \text{ tige}\) becomes

'\text{It is cut}'}
20b) \[ PP-2 \ a + PP \ be + PT-2 \ ti \ PT+1 + \text{Fall to } \emptyset \ g \ e \]
\[
\begin{array}{cc}
\text{[} & \text{[} & \text{[} & \text{[} \\
\end{array}
\]

P-ll  Definite article vowel lengthening

\[
V + PT-2 + \implies V; + PT-2 +
\]

Any vowel which is immediately followed by the low tone definite article (PT-2) is lengthened (:), e.g.

21a) \[ PP-2 \ a + PP \ ye + PT-2 + PT+1 \ so + PT-2 + L \ san \]

he \ C \ horse \ the \ buy

becomes

21b) \[ PP-2 \ a + PP \ ye + PT-2 + PT+1 \ soo; + PT-2 + L \ san \]

P-12  Upstep of non-lengthened rising vowel

\[
+ PT-2 + PT+1 \ CV + \implies + PT-1 \ CV +
\]

Any monosyllable not lengthened by rule P-ll which was assigned rising pitch by rule P-2 is modified from rising pitch to an upstep (PT-1), e.g.

22a) \[ PP-2 \ a + PP \ be + PT-2 + PT+1 \ ta + PT-2 \ bi \]

it \ -C \ carry \ today

becomes

22b) \[ PP-2 \ a + PP \ be + PT-1 \ ta + PT-2 \ bi \ [\text{[} & \text{[} & \text{[} & \text{[} \\
\]}
\]

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As stated in the beginning of this chapter, this rule brings about a neutralization between high and low tones, when the former are stepped down by the definite article, and the latter are stepped up. There is, for example, a contrast in the pitch pattern of the two following sentences.

\[
\text{ayé dúmu-ni \ ê ké} \quad [- - - - - -]
\]

he C eat-ing the do

'He ate'

\[
\text{ayé dúmu-ni \ ê ta} \quad [- - - - - -]
\]

he C eat-ing the carry

'He carried the food'

The above two sentences are distinguished in their intonations patterns by the fact that there is a greater interval between the nominal dúmu-ni 'eat-ing' and the low tone verb ta 'carry' than there is between dúmu-ni and the high tone verb ké 'do/be'.

When, however, the sentence is expanded by the addition of the low tone adverbial bi 'today', the sentence pitch patterns are identical, e.g.

\[
\text{ayé dúmu-ni \ ê ké \ ê bi} \quad [- - - - - -]
\]

he C eat-ing the do today

'He ate today'

and
a ye dumu-ni \ ta bi
he C eat-ing the carry today
'He carried the food today'

Both have the sentence pitch pattern:

\[
[\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_]
\]

The high tone verb ke may be considered as stepped-down by the definite article, and the low tone verb ta may be considered as stepped or pushed up by the low tone word bi 'today'.

P-13 preceding tone

\[
\begin{align*}
\text{L} & \rightarrow \text{PT} \\
\text{H} & \\
\varnothing & \text{CV} \\
\end{align*}
\]

P-13 states that the tone of any syllable whether low, high or unmarked which has not been rewritten by previous rule is to be rewritten as preceding tone, e.g.

23a) PP-2 daga + finman + PP ba + PT-2 + PT+1 be + PT-2 + Fall yan

becomes

23b) PP-2 da PT ga + PT fin PT man + PP ba + PT-2 + ...
P-14 Rewrite preceding tone

\[
\begin{array}{cccccccc}
\text{X} & \text{PT} & \text{Y} & \text{X} & \text{PT} & \text{Y} \\
\text{CV} & (+) & \text{CV} & \text{CV} & (+) & \text{CV} \\
1 & 2 & 3 & 4 & 1 & 2 & 1 & 4
\end{array}
\]

P-13 states that the symbol PT is to be rewritten as the preceding tone (X). After multiple operations of the rule, every syllable is marked with its relation to peak pitch, e.g.

24a) PP-2 a+ ye+ PP-2 PT-1 PT-1 PT-2 PT-1 + Fall to \( \emptyset \)

he C woman the marry

'He married the woman'

becomes

24b) PP-2 a+ ye+ PP-2 PP-1 PP-1 PP-3 PP-3 PP-2 + Fall to \( \emptyset \)

he C woman the marry

P-15 Erasure of tonal articles

\[
\begin{array}{cccc}
\text{PP-Y} & \text{Z} & \text{X} & \text{Z} \\
\text{X} & \text{Y} & \text{Z} & \text{X} \\
1 & 2 & 3 & 1 & 3
\end{array}
\]

P-15 states that any tone occurring between word boundaries which is not assigned to a syllable is to be erased, e.g.


is here

'The older sibling of the woman is here'
becomes

25b) \[ PP-2 \text{ _mu_ } so^+ PP-2 PP-1 PP-2 PP-^\frac{1}{4} + \text{Fall to } \emptyset \text{ _yan} \]

This final rule underlines the point that the tonal articles are not manifested in the surface pitch pattern as tones, but rather as the effects of tones.

The above fifteen rules illustrate how it is possible to explicitly account for the phenomena relevant to Bambara sentence pitch patterns by starting with the highly abstract two toneme contrast of high vs. low and with a series of ordered rules, reduce this abstract contrast into a statement concerning relative pitch.

By way of summary, the tonal system of Bambara could be classified as a discrete level system with a downdrift conditioned by low tone, similar in many respects to Hausa. The low tone definite article however conditions step-down phenomena, and in this respect Bambara could be called a terrace level language. It is clear in Bambara, and it may well prove to be so in other terrace level languages, that the terracing effect that is found in the surface structure is most satisfactorily analysed as being the result of a deep structure low tone.
BIBLIOGRAPHY

Balenghien, E., (1965) Quelques Notions Preliminaires a l'Etude du Bambara, Faladje, Mali, Mission Catholique (mimeographed)

____________, (1966) Les Dialected de la langue mandingue, (manuscript)


Evangelical Mission, (1953) Bambara Grammar, Kankan


Houis, M., (1966) L'Enonce en Mandingue, (manuscript)


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Welmers, William E., (1949) Tonemes and Tone Writing in Maninka, Studies in Linguistics, Vol 7, #1, 17pp