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Volume 1, Number 2
July, 1970

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A NOTE ON TONE IN TIV CONJUGATION

James D. McCawley
Department of Linguistics
University of Chicago

It is well established that many cases of downstep must be derived synchronically from an underlying high-low-high sequence as follows:

a. Specific tone levels are assigned to high and low tones by means of rules whereby consecutive highs are on the same pitch, consecutive lows are on the same pitch, and the interval down from a high to a following low exceeds the interval up from a low to a following high (i.e. highs are 'lowered' after a low),

b. Certain low tones are then either removed or assimilated to the level of a following high or (less commonly) a preceding high.

For example,[1]

Twi: mé ɔ̀bó → me^5 ɔ^{2}bo^4 → me^5 bo^4 = mé !bó 'my stone'
[Schachter and Fromkin 1968:110]

Tonga: bàlíbàlángìdè → ba^{2}li^{5}ba^{1}la^{4}ngi^{0}de^0 →
ba^{2}li^{5}ba^{4}la^{4}ngi^{0}de^0 = bàlí!bálángìdè 'they look at them' [Meeussen 1963:73]

Shambala: mìví mìhyá → mi^{2}vi^5 mi^{1}hya^4 → mi^{2}vi^5 mi^{5}hya^4 =
mìví mí!hyá 'new arrows' [Spaandonck 1967:47].

The example of deletion in Twi involved deletion of the syllable that bore the low tone responsible for the lowering of the subsequent highs. A hypothetical example where a tone rather than its bearer was deleted would be bâmá → ba$^{5-2}$ma^4 → ba^{5}ma^4, in which one of a sequence of tones on the same syllable is lost but the syllable otherwise remains unchanged. In this note I will explore the consequences of analysing

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[1]The underlying forms are quoted directly from the respective authors, though not (except in the Twi example) the intermediate stages. The superscript numerals indicate relative pitch levels, higher numbers corresponding to higher pitches. I follow the standard practise of using ´ for high tone, ` for low, ! for downstep, ^ for a high-low fall, and ˇ for a low-high rise.

downstep in Tiv as arising from deleted low tones which in underlying
structure are parts of tone sequences on single syllables. My source
of data and of many features of the analysis will be Arnott's important
paper of 1964.

Arnott presents examples both of downstep contributed by the item
following the downstep and of downstep contributed by the item preceding
the downstep, e.g.

(1)   ꭍ lú kwá   gá   'It was not a ring of huts'
       it was ring of huts not
       ꭍ lú ¡kwá gá   'It was not a leaf'
       it was leaf not

(2)   ꭍ lú tóhó gá   'It was not grass'
       it was grass not
       ká ¡tóhó gá   'It is not grass'
       it is grass not

To derive these forms, Arnott set up underlying forms with preposed and
postposed downsteps, which I propose to reinterpret as follows:

Arnott	reinterpretation	
kwá	kwá	'ring of huts'
¡kwá	kwǎ	'leaf'
lú	lú	recent past copula
ká¡	kâ	'it is'

The reinterpretation makes it necessary to have rules which eliminate
the low part of a rising or falling tone sequence on a single syllable.
Since the only rising tones in Tiv are on syllables ending in a sonorant
or a voiced spirant (e.g. bĕr 'pond' [Abraham 1940:3] and since the
formulation of tonal rules for conjugation will provide reason for treat-
ing such final sonorants and voiced spirants as if they were separate
syllables with their own tone (e.g. bĕr = bèf), Tiv must be analysed as
having no surface rising-toned syllables. Thus, a rule which deleted the
low part of underlying rising-toned syllables such as I propose for /kwǎ/
'leaf' would not affect anything other than what I want it to affect.

There do exist true falling-toned syllables in Tiv, so that there can not simply be a rule which deletes the low part of every high-low sequence on a single syllable. However, Arnott points out that precisely the words which contribute a following downstep when followed by a high pitch are pronounced with a final falling pitch when at the end of a phrase,[2] e.g.

mbá ˈkásév   'there are women'
kásév mbâ   'there are women'

Thus, the rule deleting the low part of a high-low sequence on a single syllable is only applicable non-finally, and my underlying form for items contributing a following downstep is identical with their phrase-final alternant.

The proposal to use combinations of high and low to represent downstep allows appreciable simplification in the rules which assign tone to the various forms of the verb. I have reproduced in Table 1, with slight differences in notation and layout, the tabulation of tones given by Arnott for high-toned and low-toned verbs of one, two, and three syllables. I have ignored the distinction between the large H's and L's which Arnott used to represent the tones on full syllables and the small H's and L's which he used to represent tones on the tone-bearing final voiced consonants which occur in four of the tenses, e.g. yévéséñ 'used to run away'. I have also treated the geminate vowels of the Habitual 3, Habitual 4, and Past Habitual of monosyllabic verbs as units. Thus, I treat vááñ 'comes (Habitual 3)' as exemplifying the formula HH rather than Arnott's HH .

Consider first the General Past. The downstep plus high of the first syllable of high-toned verbs will be represented as a low-high sequence on that syllable. Since the low tone on the first syllable of low-toned verbs can equally well be represented as a sequence of two low tones on that syllable, the following generalization can be made

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[2]Except, of course, that for syntactic reasons certain items such as /kâ/ 'it is' can never occur in phrase-final position.

	1-syllable		2-syllable		3-syllable	
	High	Low	High	Low	High	Low
General Past	!H	L	!H L	L L	!H L L	L L L
Recent Past A	!H	!H	!H H	L H	!H H L	L H L
Recent Past B	H	H	H H	H !H	H H L	H H L
Subjunctive			same as Recent Past B			
Habitual 1	!H	!H	!H H	L H	H H L	L H L
Habitual 2	!H!	!H!	!H H!	L H!	!H H H	nonexistant
Habitual 3	!H H	!H H	!H H H	L H H	!H H H (H)	L H H (H)
Habitual 4	H L	H L	H H L	H H L	H H H L	H H L
Past Habitual	!H L	!H L	!H H L	L H L	!H H H L	L H H L
Continuous	H L	H L	H L L	H L L	H L L	H L L
Imperative	H	H	H L	L H	H H L	L H L
Future	!H	L	H L	L L	H L L	L L L

Table 1

about General Past**s**: the first syllable has a low tone plus the basic
tone of the verb (i.e. high in the case of a high-toned verb and low in
the case of a low-toned verb), and any subsequent syllables are on a low
tone. I summarize this generalization with the formula $\widehat{LB}\ L_0$. In this
formula, the tie indicates being in the same syllable, and the sub-
script O, to be read 'zero or more', means that if there are any subse-
quent syllables, lows are to be put on all of them.

Consider now the Recent Past A. Disyllabic verbs obviously fit the
formula $\widehat{LB}$ H and trisyllabic verbs the formula $\widehat{LB}$ H L. A single formu-
la which covers both of these cases and also the monosyllabic case can
be set up by regarding the $\widehat{LB}$ and H of the last two formulas as obliga-
torily present in the Recent Past A but the L of the trisyllabic case
as merely filling up leftover syllables. If $\widehat{LB}$ and H were combined on
a single syllable, !H would result regardless of whether B were H or L:
both $\widehat{LHH}$ and $\widehat{LLH}$ would bring about lowering of the H('s), and the rule
about deleting the low part of a rising tonal sequence would leave the
equivalent results !$\widehat{HH}$ and !H. Thus, the following formula covers all

Recent Past A's, regardless of number of syllables: $\widehat{LB}$ H L_o. The proper interpretation of these formulas requires the convention that when a formula containing two syllables worth of obligatory tonal material is applied to a monosyllabic form, these tones are stuck together on that single syllable (NB: tones with the subscript 0 are not involved in this convention: they are only assigned to whatever syllables are left over after the obligatory material has been assigned).

A single formula is also possible for the Habitual 3. Since the first syllable of disyllabic and trisyllabic verbs can be interpreted as $\widehat{LB}$ and the subsequent syllables are all high, the formula $\widehat{LB}$ H_o suggests itself. That formula will not do for the monosyllabic case, since it would incorrectly predict *L H for a monosyllabic low-toned verb. To get a formula that covers this case too, it is necessary to regard two H's as obligatorily present in this tense and only the final H of tri-syllabic verbs as 'filler' material. The formula is thus $\widehat{LB}$ H H H_o. The convention about combining tones on a single syllable if there are not enough separate syllables to accomodate them will have to be refined slightly in order to insure correct application of this formula to mono-syllabic verbs (NB: a monosyllabic verb has a disyllabic Habitual 3): when three syllables worth of obligatory material is distributed over two syllables, it is necessary to combine the tone in the middle with the preceding tone rather than the following tone, since otherwise *L H would result as the Habitual 3 of a monosyllabic low-toned verb.

In six of the twelve tenses, a single formula covers all cases, and in three of the remaining tenses a formula covering two of the three verb lengths is possible. As in the formulas given on page 49 of Arnott, it is nowhere necessary to give separate formulas for high-toned and low-toned verbs, and in only one instance (the imperative of disyllabic verbs) is it necessary to resort to an at all ad-hoc notational device to avoid treating high-toned and low-toned verbs by different formulas. The formulas are:

General Past	$\widehat{LB}$ L_o
Recent Past A	$\widehat{LB}$ H L_o
Recent Past B	H (1-syll), H $\widehat{BH}$ (2-syll), H H L (3-syll)
Subjunctive	(same as Recent Past B)
Habitual 1	$\widehat{LB}$ H, except B H L (3-syll)
Habitual 2	$\widehat{LB}$ $\widehat{HL}$, except $\widehat{LB}$ H H (3-syll)
Habitual 3	$\widehat{LB}$ H H H_o
Habitual 4	H_o L
Past Habitual	$\widehat{LB}$ H H_o L
Continuous	H L_o
Imperative	H (1-syll), B $\overline{B}$ (2-syll; $\overline{B}$ = opposite of basic tone), B H L (3-syll)
Future	B L_o, except $\widehat{LB}$ (1-syll).

The treatment of downstep in Tiv as arising from the lowering effect of underlying low tones that are eventually deleted partially explains one striking feature of the Tiv verb paradigms, namely that there are several tenses in which the contrast between high-toned and low-toned verbs is neutralized only in monosyllabic verbs, but there are no tenses in which it is neutralized only in disyllabic verbs or only in trisyllabic verbs. The above discussion shows that in a tense which is covered by a single formula, tonal contrasts which are manifested in verbs of two or more syllables are neutralized in monosyllabic verbs if the combining of two syllables worth of tones on a single syllable sandwiches the basic tone between a L and a H.

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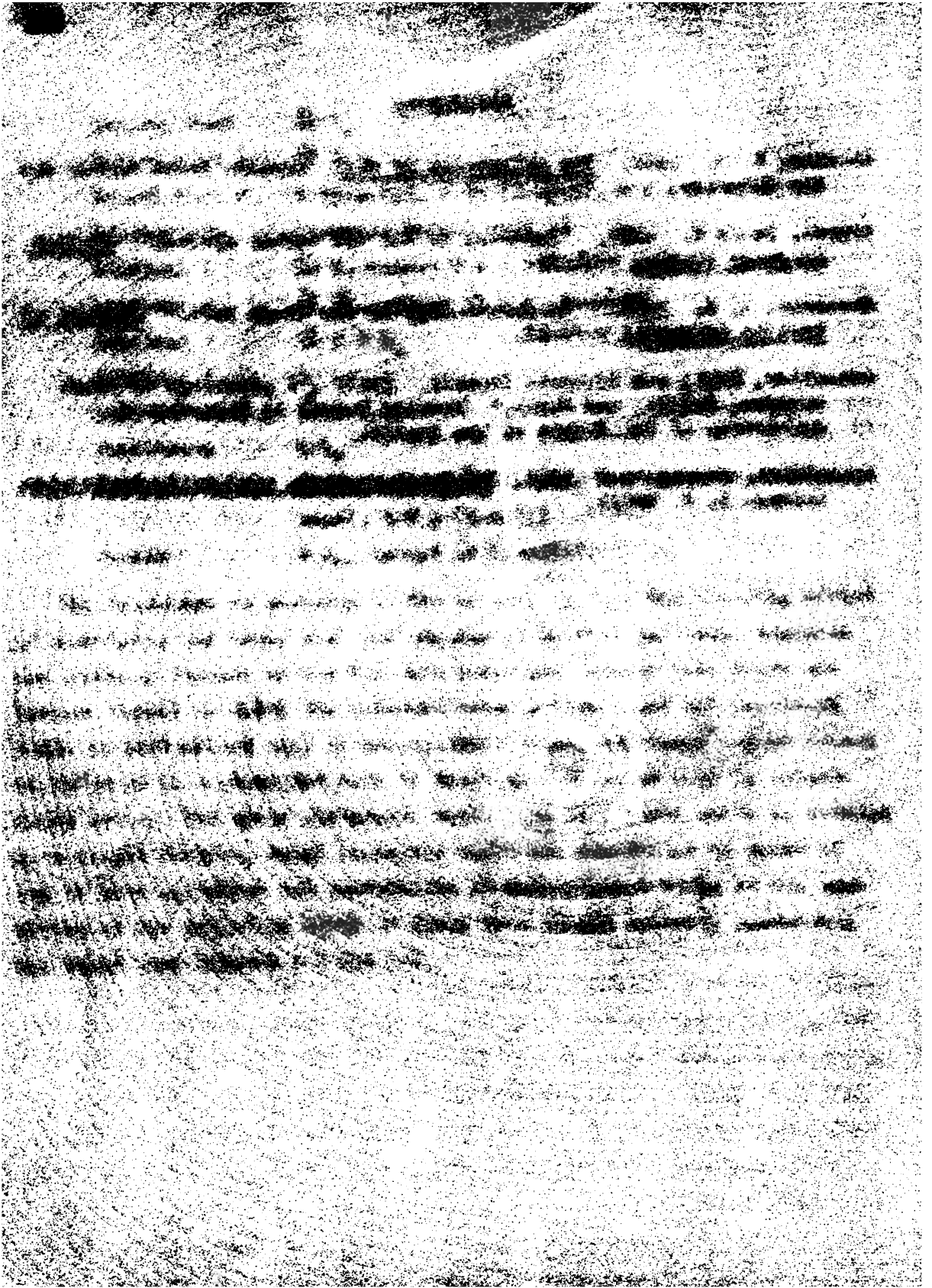
RELATIVIZATION IN UMBUNDU

Benji Wald
Department of Linguistics
Columbia University

I.

One of the transformations which lays claim to universal status is
that of relativization. Current conventions in generative grammar build
the conditions for the application of the relativization transformation
into the phrase structure by means of the recursive rule:

(1)   NP → N (S)

This convention, established by the time of Chomsky [1965:107(vii)] has
remained basically unchanged up to the present. The convention, in my
opinion, is not completely satisfactory, in that there is no control over
rewriting the embedded sentence in such a way that a N identical to the
N expressed in (1) appears in it, although this is a necessary condition
for the operation of the relativization transformation. Currently, it
appears that the resolution of this problem is achieved by assuming a set
of filters which will rule out as ungrammatical or unacceptable (the dis-
tinction is not clear) sentences with embedded sentences which do not con-
tain the identical noun but are generated through (1). To my knowledge
this has not been an issue of much concern, although there has been some
discussion of the phrase structure rules which create the conditions for
relativization, and is not dealt with in any detail in the literature on
the subject. Actually, as (1) stands, it is not as inadequate a rule for
English as it may be for many other languages when we consider such per-
fectly natural (non)standard sentences as:

(2a)   He $\begin{Bmatrix} \text{wanted me to} \\ \text{suggested that I} \end{Bmatrix}$ pay in advance which I didn't want to
        do (it).

(2b)   I lived in the mountains which it was cold there at night.

One can observe that some condition of identity is still preserved in such sentences but it is not identity of noun or noun phrase in any conventional sense. Furthermore the relative clauses in these sentences and others of this type are nonrestrictive. For the purposes of this paper I will restrict the discussion of relativization to the more well-known and discussed version, that of identical nouns. Any more general version such as that which would account for the sentences in (2), I suspect, would be less likely to be of universal validity.

One important aspect of relativization is that it is one of the strong arguments for the necessity of a grammar to contain recursive rules and to be able to produce infinitely long sentences (one way of having an infinite set of sentences). This is claimed to be a property of natural language and underlies the necessity for a distinction between competence (the grammar determining the ability to produce and understand the sentences of a language) and performance (not a well-defined notion, but apparently non-linguistic factors interfering with competence). Thus, it is claimed that a sentence with, say, five or ten embedded relative clauses is grammatical although it will never occur in natural discourse. In general, I think that the distinction between competence and performance has been somewhat arbitrarily made in actual analytic practice, and that the actual design of language must be determined by factors that also determine performance, to some extent, since language is a human creation for use by humans, but I do not think that recursion is relevant to this issue. The most current challenge to recursion (of certain types) on the grounds of performance is that of Reich [1969]. He objects to the grammatical status of multiple central embedding and would like to rule it out of the grammar by means of a set of conventions opposed to (1) above which allows it to exist. He challenges the grammaticality of sentences such as:

(3)   The ship which the man that my father paid built sank.

In point of fact, one must account for the awkwardness and/or nonoccurrence of sentences of this magnitude of complexity. However, if we accept the relatedness of active and passive sentences, expressed by means

of the passive transformation, we cannot accept Reich's alternative model
which, in effect, makes the discussion no longer one of grammatical
structure. Reich's paper implies that he himself would accept the gram-
maticality and even potential infiniteness of such sentences as:

(4)   The ship which was built by the man who was paid by my father
        sank.

It seems then that the difference in intelligibility between (3) and
(4) are matters of surface structure or perhaps intermediate structure
but certainly not of deep structure. I will explore this issue of the
difference between (3) and (4) which entails a difference between active
and passive and their use according to discourse conventions elsewhere.
My only aim here has been to establish the basic importance of relativi-
zation to current issues in linguistic theory.

II.
    The claim that all languages have a phrase structure rule which has
been represented as (1) is not directly verifiable since there are no
languages known to linguists that have the surface form which (1) by it-
self would generate. In other words, (1) always produces structures
which are subject to certain transformations. If this is the case, what
does (1) mean? Leaving aside questions of simplicity in the description
of specific languages, for this is by no means a settled issue, I would
interpret (1) as a claim that all languages have a device for incorporat-
ing certain information into a single sentence, information that could
also be expressed in more than one sentence without changing lexical
items of high information content. Thus,

(5)   The man whom you met yesterday has arrived.

contains the same semantic information as

(6)   The man has arrived. You met $\begin{Bmatrix} him \\ that\ man \end{Bmatrix}$ yesterday.

The differences between (5) and (6) involve sentences within a discourse
and the appropriate way of organizing information in a discourse. In

terms of sentence grammar, however, (5) contains the same information as
(6). The function of relativization appears to be the identification of
the antecedent noun, in contrast to other <u>objects</u> that could be referred
to by the same noun when it remains without further specification. Thus
we should no more expect a language to be without relativization than
without demonstratives (this, that, etc.) and it would be even more sur-
prising to find a language without a relativization device than to find
one without demonstratives. In fact, some of the Bantu languages present
morphological evidence that relative embedded sentences and demonstra-
tives should be dominated by the same category symbol, that which is
generally called Det(erminer). Syntactic evidence can probably be found
in any language.

In Umbundu, the major Bantu language of Angola,[1] there are three
demonstratives. They are morphologically complex and are as follows:

(7)   'this'   a + Vowel of Class Prefix + Class Prefix
      'that' (near you)   o + Class Prefix + o
      'that' (unspecified) Class Prefix + na

For example,

(8)
u-lume { a-u-u > uu[2] } { 'this }
        { o-u-o > oo   } { 'that } man'
        { u-na   > una } { 'that }

a-lume { a-a-va > ava } { 'these }
        { o-va-o > ovo } { 'those } men'
        { va-na > vana } { 'those }

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[1]Although Umbundu is the major Bantu language of Angola, Portuguese
colonial policy does not grant it any recognition, not to mention official
status. Many Ovimbundu, as a result, have lost pride in the language.
It is not clear what the general status of the language among its speakers
is, but I would like to express my anger at this attempt to discredit and
destroy the African cultural heritage in Angola.

[2]or oo, irregular morphophonemically.

$$o-m-bwa^{3} \begin{cases} a-i-yi^{4} & > & eyi \\ o-yi-o & > & oyo \\ yi-na & > & yina \end{cases} \quad \begin{cases} \text{'this} \\ \text{'that} \\ \text{'those} \end{cases} \quad dog'$$

These forms are used as relative markers and, as a result, location of the antecedent is obligatorily marked. However, location need not be spatial in the concrete sense. As one would expect, since specification of location is unavoidable, the least semantically marked demonstrative is most commonly used if location is unimportant or unknown. Elicitation of sentences with relatives in them, out of any locative context, brings the -na form as a response.[5]

One is not justified in separating the two uses of these demonstratives into two different sets of morphemes. That is, one cannot claim that there are two (u-)na 's for example, one a demonstrative and the other a relative marker, since:

(9)   ulume <u>una</u>   ndamõia heĩa   wayongola okulya

      man   that (one) I saw   yesterday wanted   to eat

      'the/that man whom I saw yesterday wanted to eat'

but not,

(10) *ulume <u>una</u> <u>una</u> ndamõia heĩa wayongola okulya

purportedly,'that man that I saw yesterday wanted to eat'. Similar arguments exist for all other forms of the demonstratives.

      A sentence such as:

(11) ulume <u>uu</u> ndamõia heĩa wayongola okulya

      man this (one) whom I saw yesterday wanted to eat

      'this man whom I saw yesterday wanted to eat'

---

[3]o is an automatic preprefix.

[4]With typical Bantu vowel coalescence.

[5]Class Prefix + na demonstrative is optionally deleted under certain conditions, but if the speaker responded with a sentence with no overt relative marker, the paraphrase with -na was the most acceptable. There are other conditions under which -na cannot be deleted for syntactic reasons, not because location is an issue. This indicates that -na is the unmarked demonstrative.

raises the question of the distinction between restrictive and nonrestric-
tive relative clauses. (11) is perfectly acceptable but if it is taken
to be a nonrestrictive, its source, according to current generative
thought on the subject, is different from that of restrictive relative
clauses and is not from a deep structure generated by (1). In accord
with the above discussion, the restrictive relative clause appears to
"filter out" objects from the set of possible objects referred to by the
noun, while the nonrestrictive simply presents additional information
about the object referred to by the noun. Having both a demonstrative
and a restrictive clause then appears to unnecessarily doubly identify
the noun; this makes the nonrestrictive interpretation of the relative
clause more probable. However, the Umbundu usage is such that (11) can
be either restrictive or nonrestrictive like the equivalent English
translation where a restrictive interpretation can be obtained, at least
colloquially, with an unstressed this. (10) is rejected under any inter-
pretation. I shall restrict the rest of my paper to the restrictive
relative clause intended in the recursive rule (1).

So far we have not justified a node dominating both Dem(onstrative)
and the embedded S, but simply a rule of the type:

(12)   NP → N (Dem (S))

This simply leads to a tripartite division if all options are taken:

(13)
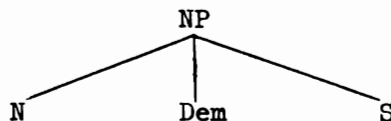
(12) is strange in that it implicitly allows a dependency relation to
exist in the choice of S on Dem, i.e. the choice of S depends on Dem be-
ing selected. The seemingly innocuous convention allowing (12) to be
represented, is a rather strong claim about the possible structure of
language, i.e. that there can be unmotivated dependency relations. It
would seem, however, rather arbitrary to break (12) into two rules simply
to form a node to avoid this problem without any empirical motivation.
That is, to insist that (12) is nonconventional and must be converted into

(14a) NP → N (Det)

(14b) Det → Dem (S)

Fortunately for the conventions, there is further motivation for the two rules in (14), as against (12). This has to do with the extraposition of relative clauses from the NP. Thus, we may convert (9) into

(15)   ulume wayongola okulya una ndamõla heĩa

     'the man wanted to eat, whom I saw yesterday'

but not,

(16)   *ulume una wayongola okulya ndamõla heĩa.

(16) is not grammatical and does not even mean

(17)   'the man who wanted to eat I saw yesterday'.

(17) is an example of Topicalization (Ross) or Y-Movement (Postal) and has an Umbundu analog, but it is not (16). It is:

(18)   Ulume una wayongola okulya ndoo[6] mõla heĩa

     'the man who wanted to eat — I saw him yesterday'

This transformation, I call it Preposing, converts structures such as

(19)   ndamõla ulume

     'I saw the man'

into

(20)   ulume ndoomõla

     'the man, I saw him'

and will be discussed later. (15) and (16) suggest that $[una]_{Dem}[ndamõla\ heĩa]_S$ moves as a unit and therefore the two constituents are dominated by a node which unites them. This supports the structural analysis predicted by (14) rather than by (12).

It appears that many languages of the Congo share this overt morphological property with Umbundu and some varieties of Congo Swahili use the

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[6]From nda-u where u is the object marker referring to ulume.

Swahili demonstrative as a relative marker e.g. m(un)tu yule nilimwona
jana alitaka kula which is unacceptable in Coastal Swahili. In Standard
Swahili ambaye would be used instead of yule here or mtu niliyemwona
jana alitaka kula with the referential marker ye, indicating relativi-
zation, appended to the tense particle.

III.

   If there are universal aspects to relativization as Bach [1965] sug-
gests, is there a single rule relative transformation? Or are there,
alternatively, several rules in a specific language, one or more being
universal, the others being language specific (since surface relativiza-
tion is not identical in all languages)?

   Essentially, the recurrent or universal aspect of relativization
rules has been indicated as the pronominalization of the noun referring
to the antecedent and its movement to the head of the embedded S and its
deletion or conversion into a relative marker, or alternately the crea-
tion of a relative marker introducing the embedded sentence and the at-
traction of the relativized noun to it in a pronominalized form.

   For example, if we take (9) again, presumably the underlying struc-
ture at the stage of the derivation that relativization begins to operate
is:

(21)
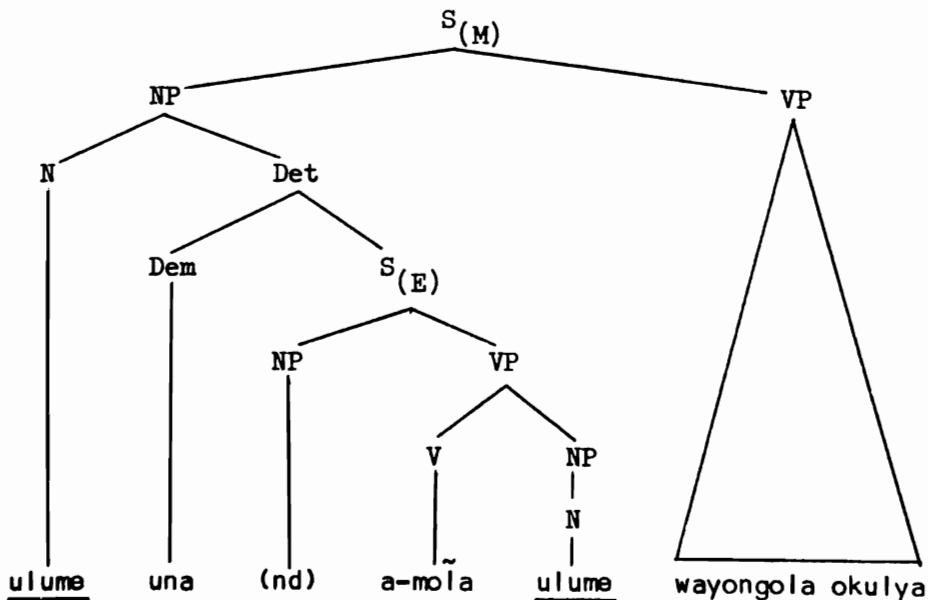
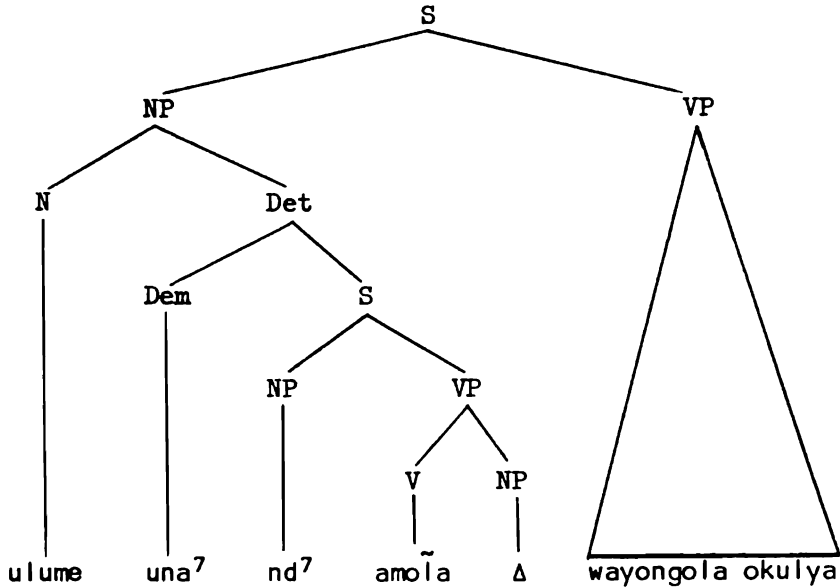The underlined N in the embedded S is to be relativized and is identical to the underlined N in the matrix sentence. According to the universal rule ulume in S_E should be moved to the front of S_E and then deleted.

Now, several objections may be raised at this point. The first objection has to do with the representation of (21) and, in fact, is part of my previously mentioned dissatisfaction with (1) or its revised form (14). That is, that the implication of (21) is that the underlined noun in S_E has already been lexically inserted. I believe that this is an error and probably has its roots in the earlier generative distinction between local and generalized transformations. Before Chomsky [1965], the practice was to describe relativization as a generalized transformation, i.e. as the combining of two independent sentences. (See Chomsky [1957:113], for example.) While Chomsky [1965] established recursion in the phrase structure by means of rules such as (1) the theory, as a whole, for a variety of reasons, left the convention that lexical insertion into terminal symbols precede all transformations. This means that the underlined N in S_E must undergo lexical insertion before any rules of relativization apply. The relativization transformation then specified that the relativized noun (phrase) be identical morphologically as well as referentially to the noun of the matrix S. This was because of the principle of recoverability. Since the NP was to be deleted after having been previously (lexically) inserted, it would only be recoverable if it was identical to the antecedent NP. In effect, the notation of the transformation made it look like morphological identity was a necessary although insufficient condition for relativization. In essence, this is the same problem that leads to the Bach-Peters paradox in pronominalization, viz. morphological identity of coreferents. I contend that the NP which is to be deleted or pronominalized should not have been lexically inserted in the first place, but rather that coreference alone is a sufficient condition. At present, the representation for a terminal symbol which is not lexically filled is the dummy symbol Δ. Thus, a more accurate representation of (21) would be

(22)

```
                              S
                   _____
                  NP                        VP
           _____                   /\
          N             Det                 /  \
          |         _____              /    \
          |        Dem        S            /      \
          |         |     _____      /        \
          |         |    NP        VP    /          \
          |         |    |        /\    /            \
          |         |    |       V  NP /              \
          |         |    |       |  | /                \
        ulume     una⁷  nd⁷   amõla  Δ  wayongola okulya
```

Such a convention in all coreference situations (of which relativiza-
tion is one) avoids the Bach-Peters paradox, and also the problem with
quantifiers exposed and discussed by McCawley and Lakoff in various
papers and lectures, viz. how to distinguish the underlying structures
of all men want to be rich and all men want all men to be rich. These
problems of pronominalization naturally affect relativization as well.
The problem still remains as to how to express coreference, but that was
a problem before as well. If we could in some way establish the conven-
tion that when the embedded S in (14) is expanded, there must be a Δ
where coreference is intended, then my original objection to (1) and
(14) would lose its force. While this may seem to be merely a matter of
alternative notations, Δ versus lexically filled symbols, the Bach-Peters
paradox and the quantifier problem illustrate the extent to which nota-
tion can become a linguistic issue.

A major problem with the proposed Δ is that it has no semantic-syn-
tactic features, some of which are necessary in most languages to produce

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[7]We will pass over other problems in the accuracy of (22). For ex-
ample, nd- should actually be a feature of V and is a concord for an
underlying NP meaning 'I' and una should not necessarily have been
lexically inserted at this point. I am trying to avoid irrelevant com-
plications in the diagram.

grammatical sentences. In fact, the basis of lexical insertion preceding transformations was to express coocurrence restrictions through selectional rules. It follows then that there must be rules which map necessary features onto Δ from the coreferent noun, a copying rule. In order to insure correct coocurrence restrictions, the number of features and which features should be copied has to be investigated. It is not likely that all features should be copied. In any case the Δ remains a Δ no matter how many features are copied onto it and it will not appear in the surface structure although its effects will. Swahili offers some evidence for this position, where concord has the following effects:

(23a) mtoto <u>wangu</u> ni mkubwa
     'my child is big'

(23b) mtoto mkubwa ni <u>wangu</u>
     'the big child is mine'

where **mtoto** is one of a class of nouns which takes mu- concord, w- with the possessive;

(24a) nyumba <u>yangu</u> ni kubwa
     'my house is big'

(24b) nyumba kubwa ni <u>yangu</u>
     'the big house is mine'

where nyumba is one of a class of nouns which takes ni- concord, y- with the possessive. Now, with kinship terms we get what appears to be mixed concord.
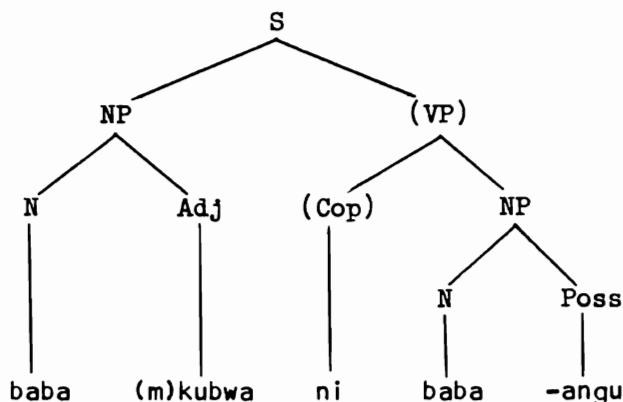
(25) baba <u>yangu</u> ni mkubwa
     'my father is big'   cf. (24a)

(26) baba mkubwa ni <u>wangu</u>
     'the big father is mine'   cf. (23b)

There is a general rule in Swahili that human nouns take mu- concord. We can see that (25) violates that rule. There is a finer rule that kinship terms in the possessive construction, which is where they
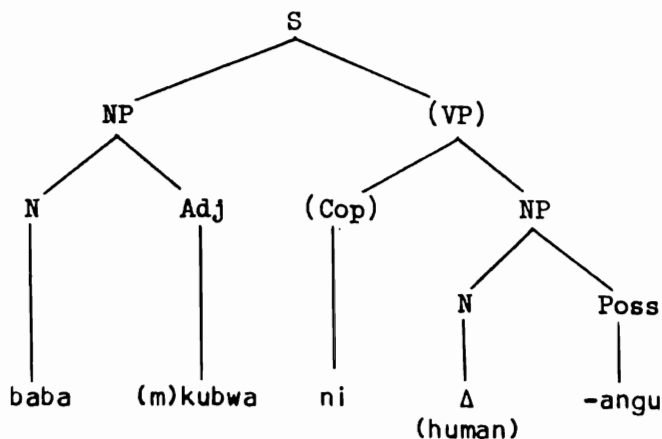
most frequently occur, take ni- concord in the possessive. This rule
is apparently acquired late in that speakers claim that baba wangu (cf.
(25)) sounds 'childish'. At any rate, according to the lexical insertion
theory the source of (26) should be

(27)

```
                              S
                    _____/ _____
                   /                   \
                  NP                   (VP)
               __/  \__             __/    \__
              /        \           /          \
             N         Adj      (Cop)          NP
             |          |         |          _/  \_
             |          |         |         /      \
             |          |         |        N       Poss
             |          |         |        |        |
           baba     (m)kubwa      ni      baba    -angu
```

(Again, the diagram (27) is rough; Poss, for instance, could be further
complicated.) If (27) is taken as the source of (26) there is no genera-
lization that we can make about the fact that kinship terms being human
take human concord in (26) but not in (25). (25) is the exception; (26)
is not. But when concord is applied (25) and (26) are indistinguishable
if both are represented as the NP dominated by (VP) is in (27). The pro-
posal I have made, however, will take the source of (26) to be (28) with
the feature human copied onto the Δ but not the feature(s) determining
kinship.

(28)

```
                              S
                    _____/ _____
                   /                   \
                  NP                   (VP)
               __/  \__             __/    \__
              /        \           /          \
             N         Adj      (Cop)          NP
             |          |         |          _/  \_
             |          |         |         /      \
             |          |         |        N       Poss
             |          |         |        |        |
           baba     (m)kubwa      ni       Δ      -angu
                                        (human)
```

The evidence is not conclusive but I think it is worthy of consideration.

Returning to (22), if we stick strictly to Umbundu, one might argue that on the basis of the evidence considered so far it is unnecessary to consider the coreferential noun to have moved but it could be deleted where it stands. In this case there is compelling evidence in terms of the generative model that there is a movement of the N of the relative clause.

Compare the following:

(29)   ufeko w-alya
        'the girl ate'
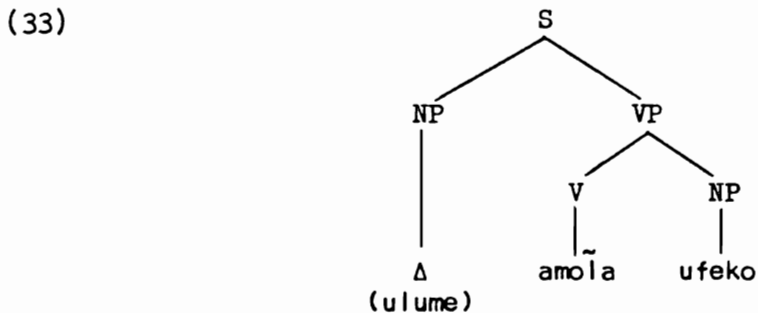
(30)   ulume w-alya
        'the man ate'

Both ufeko and ulume belong to the same concord class and pro-duce a subject marker w (underlying o) by a concordial rule operating on the verb.

Now compare the following sentences:

(31)   ulume una w̰amõla ufeko wayongola okulya
        'the man who saw the girl wanted to eat'

(32)   ulume una ufeko a̰mõla wayongola okulya
        'the man whom the girl saw wanted to eat'

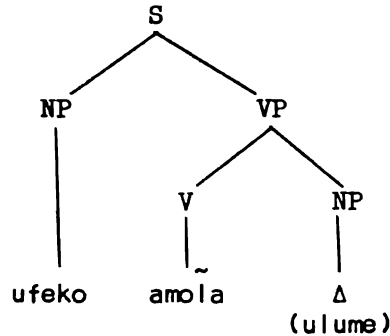The structure of the source of the relative clause in (31) is

(33)

```
                          S
                 _____/ _____
               NP                    VP
                |                 ___/ \___
                |                V         NP
                |                |          |
                Δ             amõla       ufeko
             (ulume)
```

Before relativization subject marking operates on the verb causing a-mõla (Past Tense + Verb Stem) to be realized as w-amõla. This means

the appropriate noun class features have been copied on to the NP Δ.
Clearly, subject marking precedes relativization rules.

In (32) the source of the relative clause is

(34)

```
                    S
                  /   \
               NP      VP
                |      / \
                |     V   NP
                |     |    |
             ufeko  amõla  Δ
                        (ulume)
```

Since subject marking precedes relativization, we expect   amõla   to
be changed to   wamõla   as in (29), (30), (31), but in (32) we see the
surface form has no   w-,   although if we paraphrase (32) with a passive:

(35)   ulume una w̲amw̃ĩwa (lufeko) wayongola okulya

     'the man who was seen (by the girl) wanted to eat'

the subject marker appears on the surface; and if we do the same with
(31):

(36)   ulume una ufeko amw̃ĩwa lahẽ wayongola okulya

     'the man whom the girl was seen by wanted to eat'

the subject marker does not appear.

(32) and (36) have in common the absence of a subject marker and in
both cases the relativized noun was not the subject, but behind the verb.
The universal rule says that the relativized noun will move to the be-
ginning of its sentence. We can then attribute the absence of the sub-
ject marker to the movement of the relativized noun, i.e. the coreferent
Δ, over the verb. It appears then that the subject marking rule applies
and then if the Δ moves over the verb during relativization the subject
marker is erased.

Actually, the subject marker   w   is not erased but changed to   a.
This can be seen in other tenses. For example, in the present
continuous:

(37a) ulume una o̱kasi okulya olusi unene

      'the man who is eating the fish is big'

(37b) olusi luna ulume a̱kasi okulya lunene

      'the fish which the man is eating is big'

The phonological rules of Umbundu require that o-a-lya > w-a-lya 'he ate' versus o-kasi okulya 'he is eating' and a-a-lya > a-lya 'he ate'.

Thus, the change is from o to a, and may be ascribed to the movement of the relativized NP over the verb. This change only occurs with the subject marker for the animate ((m)u- class) noun class in the singular and will be referred to as the o/a alternation for future reference.

Support for this analysis comes from another source. In interrogatives, the question word may either precede or follow the verb. Since the language, as all the examples above have shown (and note Preposing (19) and (20) in particular), is underlying SVO we assume that a transformation moves the question word to the front of the sentence, i.e. over the verb. Thus, we have pairs of sentences of which the first is the source of the second (in a manner of speaking):

(38a) walinga nye   'what did he do?'

(38b) nye alinga

(39a) waenda pi   'where did he go?'

(39b) pi aenda

(40a) waveta eliye   'whom did he hit?'

(40b) heliye aveta (heliye and eliye 'who(m)' vary in just this way)

There are also sentences involving negative attraction:
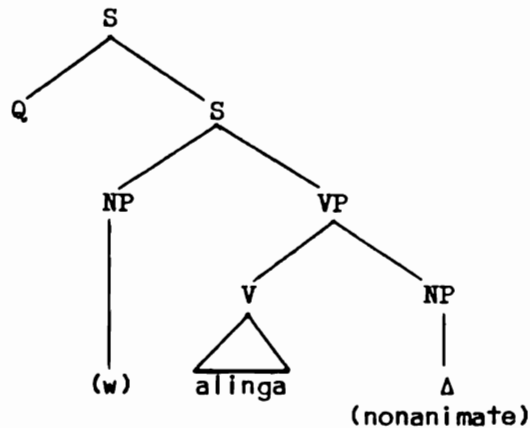
(41a) kalingile cimwẽ   'he didn't do anything'

(41b) lacimwẽ alinga   'he did nothing'

In all cases we notice the o/a alternation and in all cases the question word or negated noun has been preposed to the verb.
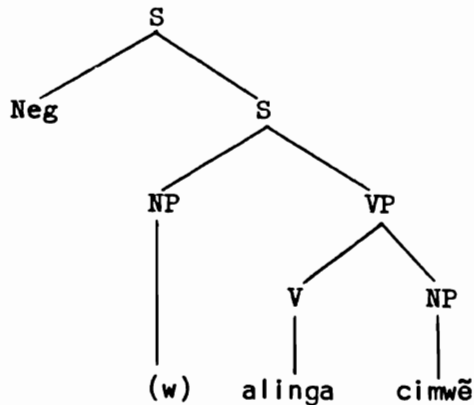
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This all strongly suggests that when a noun moves over a verb in a transformation of a certain type o > a is operant. It is thus not a transformation-specific rule but provides evidence that in relativization, the relativized NP is moved rather than deleted where it stands. I suggest that the structural description that relates the negative, interrogative, and relative transformations is a category symbol dominating the main S, which attracts a noun in that S from behind the main verb of that S. Thus, the underlying structure of (38) is:

(42)

```
              S
           /     \
          Q       S
                /   \
              NP     VP
              |     /  \
                   V    NP
             (w)  /\    |
                 /  \   Δ
              alinga  (nonanimate)
```

Underlying (41) is the structure:

(43)

```
              S
           /     \
         Neg      S
                /   \
              NP     VP
              |     /  \
                   V    NP
             (w)   |    |
                alinga  cimwẽ
```

and the Dem symbol is the overt attracting element in the relative (as in (22) for example).

Because of other properties of Umbundu grammatical structure, surface minimal pairs are possible involving the o/a alternation. For example,

(44)   ulume una wamõla walya

    'the man who saw (something) ate'

(45)   ulume una amõla walya

    'the man whom he saw ate'

(44) is possible because no Umbundu transitive verb requires a surface direct object. The effect, however, is not the same as in English usage, and wamõla is more appropriately translated 'he did seeing' than 'he saw' in the sense that he wasn't blind (anymore). One might want to describe this phenomenon by a dummy-object deletion rule.

There is one final point which must be brought up to complete the picture. The data as presented so far is quite consistent and allows a description which relates several processes; the interrogative, the negative, and relativization in an insightful way. However, upon further investigation I elicited the following:

(46)   ulume una ufeko alya olusi lwahẽ wasanjuka

    (the) man that (the) girl ate his fish (is) happy

    'the man whose fish the girl ate is happy'

The pronominal trace in this <u>possessive</u> sentence is typical of Bantu and presents no particular problem (cf. (36) with la-hẽ 'by him'). The o > a has applied as expected in conformity to the rule since the relativized NP referring to ulume moved over the verb. But now,

(47)   ulume una omõlahẽ $\left\{ \begin{array}{l} \text{amwĩwa} \\ \text{*wamwĩwa} \end{array} \right\}$ lufeko wasanjuka

    (the) man that his-son was-seen (by) (the) girl (is) happy

    'the man whose son was seen by the girl is happy'

It appears then that movement over the verb is not the correct generalization since omõlahẽ for omõla wa (ulume) always preceded the verb. Since all my data was collected from one informant I do not know whether this construction, (47), is typical of any Umbundu speech community, i.e. whether it is variable, dialectal, or idiosyncratic. Judging by my one informant if a grammatical change is involved in extending

the o/a alternation to constructions like (47) it is complete. Given
that most of the evidence points to the conditions for o/a as being the
movement of a NP over a verb, the Umbundu generalization is that any move-
ment of the relativized noun from its original position during the rela-
tivization transformation will register the change of o to a. This
leaves only the subject relativized noun unaffected since this NP moves
vacuously, i.e. not at all.

Having raised the question of grammatical change, I would like to
explore the historical aspect of this change in the following section.

IV.

The alternation o/a is widespread among Bantu languages. In some
languages it has a distinctive function as in Umbundu, demonstrated by
(44) versus (45). In other languages it is determined by surface co-
occurrence restrictions.

This alternation occurs, for example, in Swahili as the yu/a alter-
nation. It serves no distinctive function in Swahili, the a being the
animate singular subject marker and the yu being the pronominal concord
marker for the same class. Thus, in Swahili: a-li-cheka 'he laughed',
watoto aliowaona mtu 'the children whom the sam saw', mtu aliyewaona
watoto 'the man who saw the children', etc. and: mtu yule 'that man',
mtu huyu 'this man', mtu huyo (« hu-yu-o) 'the man just mentioned',
mtu yu tayari 'the man is ready', etc. In the literature on Swahili
dialects it is sometimes reported that yu is used with the short present
tense as a subject marker (e.g. Ashton [1944]), but it is still incapable
of surface contrast with a.

It will not be possible in this paper to go into the origin of the
contrast between the two forms of the concord, but the contrast exhibited
by Umbundu also occurs in the Nguni group (Zulu, Xhosa, etc.) and gives
us more insight into the development seen in Umbundu. Certain aspects
of Zulu relativization support the notion that the Umbundu o/a alterna-
tion has been extended to positions like that in (47) and also help us
understand one line of development of relativization in Bantu generally.

Zulu has the alternation in the form of u/a and works similarly to the Umbundu alternation in the relative construction. The following examples are adapted from Louw, Ziervogel, Ngidi [1967].

(48)   umfazi omsizayo umfana ufundile
        'the woman who helped the boy is learned'

(49)   umfazi amsizayo umfana ufundile
        'the woman whom the boy helped is learned'

(48) and (49) differ in the same way that (31) and (32) above in Umbundu differ, and represent equivalent underlying structures (cf. relative clause in (33) and (34)).

The morphological structure of omsizayo in (48) (a-u-mu-siza-o) is a (introducer of the relative clause), u (third person animate subject marker in singular), m(u) (animate singular object marker agreeing with umfana 'boy'), siza (verb stem 'help'), (y)o (unmarked for concord referential particle marking the relative clause along with the initial morpheme a). The morphological structure of amsizayo (< a-a-mu-siza-o) in (49) is the same as that in (48) except that u is replaced by a. (a + a > a and a + u > o are regular phonological processes in Zulu, as in most Bantu languages.)

There are, however, notable differences between the pairs Umbundu (31), (32) and Zulu (48), (49). The relativizers a and yo are absent in Umbundu, but there is evidence that a derives, at least historically, from an original demonstrative, e.g. Jordan [1967], and therefore is equivalent to Umbundu Class Prefix + na. The subject NP of the relative clause in (49) is postposed and there is an object marker prefixed to the verb stem in (48) and (49). Postposition of the subject NP cannot occur in Umbundu, but is optional in Zulu. Object marking is operant under different conditions in Zulu and Umbundu. In Umbundu, object marking occurs if the object NP is preposed to the verb as in (20) above.[8] In

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[8]Note that this preposing rule in Umbundu is different from the one discussed for (38)-(45) above where attraction is involved and the structural descriptions for the transformations are different.

Zulu, object marking is optional in most contexts but preposing and post-posing are contingent upon it. This indicates that Umbundu represents an older stage of Bantu in this respect where object marking is not well developed compared to Zulu (and Swahili) and 'scrambling' (preposing and postposing) is not possible in Umbundu. In Zulu,

(50a) umfana upheka ukudya   'the boy cooks food'

(50b) umfana uya<u>ku</u>pheka ukudya   "   "   "   "   (with object marker)

(50c) umfana ukudya uya<u>ku</u>pheka   "   "   "   "   ("   "   "   )

(50d) ukudya uya<u>ku</u>pheka umfana   "   "   "   "   ("   "   "   )

but not:

(50e) *umfana ukudya upheka

or

(50f) *ukudya upheka umfana

The ku, as in uyakupheka of (50b)-(50d), is the object marker agreeing in concord with the object ukudya 'food'.[9]

These data suggest that in Zulu object marking must precede preposing and postposing, and postposition is optional; while in Umbundu, post-posing is impossible, and preposing and object marking are concomitant (or object marking makes preposing obligatory); Umbundu therefore seems less highly developed in object marking, and represents an older stage of Bantu. Umbundu relativization when compared to Zulu exhibits an older and simpler system; that is:

(51a) Overtness of the demonstrative as a condition for relativization
(51b) Stricter constraints on object marking

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[9]The ya or 'long' form of the present is not relevant to the present discussion but indicates an interesting line of development for the object marker in Zulu and elsewhere outside the Nguni group. This will be dis-cussed in the paper on Bantu coreference. In this paper we need only note that descriptively the 'long' form of the present, as opposed to the $\emptyset$ 'short' present occurs obligatorily when the object marker is present or the object noun is unrealized on the surface.

(51c)   More reliance on (or weight carried by) the o/a contrast for
        indicating the grammatical function of NP's in a S.

In this light we can see the Swahili development of subcategorizing
nouns semantically (animate versus inanimate) for optionality or obliga-
toriness or object marking (animate objects must cause object marking),
as an innovation and extention of the line of development seen in Umbundu
and Zulu. The loss of the o/a functional distinction and Swahili's
form of relativization may also be seen as being influenced by the develop-
ment of object marking. These grammatical changes intersect with other
Bantu grammatical devices such as the pre-prefix and will be discussed
in another paper on the development of coreference devices in Bantu
languages.

Returning to Zulu, we find the following situation in relative
clauses where the possessive is involved:

(52a)   umfana a(si)thenga isigqoko sakhe umfazi uhambe
        (the) boy (who) (the) woman bought his hat has gone
        'the boy whose hat the woman bought has gone'

(52b)   izinkomo ezimelusi wazo ulele zizofohla
        (the) cattle (which) (the) herdboy of-them is asleep will escape
        'the cattle whose herdboy is asleep will escape'

In (52a) a(si)thenga consists of the relative marker a, the subject
marker a (not u) as expected (since the relativized NP is behind
the verb), an optional object marker si agreeing with isigqoko 'hat',
and the verb stem thenga 'buy'. (52a) is comparable to (46) in
Umbundu. We expect the subject marker a since the relativized NP
represented by khe in sakhe (si agreeing with isigqoko, a posses-
sive, khe the trace agreeing with umfana) is behind the verb and thus
the Δ NP moved over the verb leaving the pronominal trace khe behind.
In (52b) we note that u-lele has a subject marker u agreeing with
(u)melusi 'herdboy'. The antecedent of the relative clause is izinkomo
and has left its trace in the possessive wazo (u+a+zi+o: uu for umelusi,
a possessive, zi for izinkomo, and o referential). The u is in

contradistinction to (47) in Umbundu in the same type of construction. The Δ NP in (52b) did not move over the verb; but it did move, if one assumes that relativization moves the relativized NP to sentence initial position, as in Umbundu. This movement, not over the verb, has not been registered by a change of u to a in Zulu.

(53)   umfazi ongane yakhe igulayo uyahlupheka

       (the) woman (who) her child is sick is suffering

       'the woman whose child is sick is suffering'

(53) is also to be compared with (47). The crucial word in (53) is the NP ongane which consists of a (relative marker), u (concord with the antecedent umfazi 'woman'), ngane (noun 'child', with pre-prefix form is ingane). Note that u is the form for the concord for the antecedent 'possessor' umfazi. This construction is not directly comparable to any Umbundu construction, but again the point is that the relativized NP does not move over the verb, and its concord is u, not a .

        The data in (52) and (53) above, in particular, support the notion that the o/a alternation in Umbundu originally applied only to movement over the verb. The grammatical change in Umbundu is thus:

(54a)   Originally the a concord marker denoted the movement of a NP over a verb. This is seen in Zulu and supported by the Umbundu interrogative and negative attraction movements.

(54b)   Umbundu has generalized the rule in the relative so that any movement of the NP from its original position registers a concord rather than u. This has the effect that only a NP coreferent with the antecedent and which is the subject of the relative clause registers as u, since only here is movement to the front of the sentence vacuous. In the possessive, if the possessor of the subject is coreferent with the antecedent, it moves over the subject NP leaving a pronominal trace in the possessive, and this nonvacuous movement is a new environment for the o > a rule.

On the basis of our present knowledge of grammatical change, and due to insufficient data on closely related languages, it is difficult to say whether the o/a alternation in Umbundu negative and interrogative sentences is an innovation or more typical of an earlier stage of Bantu. Accurate comparative and dialect geographical data should enable this problem to be resolved and elucidate more of the principles of grammatical change.

The only further data I have to bear on the matter are anecdotal. It is not typical of Bantu to have a negative morpheme attached to a noun as far as I have been able to ascertain. Umbundu is almost unique in this respect. I had a conversation with someone passing through New York City who speaks Vambo, a Bantu dialect-cluster of South-West Africa. Vambo is closely related to Umbundu. With regard to the negative, I found that negation with indefinites is accomplished by means of the existential paraphrasis in standard Vambo, i.e. the most acceptable style of Vambo speech. So, to say I didn't see anyone one must say there wasn't anyone (a person) whom I saw. This is typical of a large variety of Bantu languages. However, the speaker admitted that in nonstandard, i.e. less acceptable speech, most frequently among younger people, Neg + someone was possible as an alternative for 'there-Tense-not-be-someone who ...' which is equivalent to Umbundu practice (this is my observation; the speaker did not know Umbundu). This seems to indicate a spread of the Umbundu-type construction southward and that the construction involving a negative morpheme attached to a nominal form is of recent origin. It follows that the o/a alternation in the negative cannot be of Proto-Bantu origin. It is my guess that the application of this alternation to Neg and Q has its origin in the relative construction as a device for foregrounding; i.e. nothing (is what) he did (41) and what (is it that) he did (38). Relativization is a well known grammatical device in Bantu languages and elsewhere for foregrounding of Q and Neg words in connection with a particular NP.

V.

I would like to discuss the implications of the body of this paper for aspects of generative linguistic theory, in conclusion.

(a) the relative S should be represented as dominated by Determiner in the deep structure and commanded by Demonstrative.

(b) the demonstrative with relative clauses, the Q-marker, and the Neg-marker share the property of commanding a S (see (22), (42), (43)). It is therefore not entirely fortuitous that morphologically the relative marker resembles the demonstrative in many languages, e.g. English that, and it is likely that the Q-marker and the relative marker are closely related, cf. most Indo-European languages.

(c) the NP coreferent to the antecedent of the relative S should not be lexically filled. This eliminates counterintuitive filtering rules for blocking sentences with relative clauses without coreferent NP's.

(d) All Δ's should be deleted by a surface convention that lexically un-filled items obviously have no phonological representation. Deletion of apparently lexically filled items should be viewed with suspicion, es-pecially when the level of abstraction is high.[10]

(e) Certain rules such as Umbundu o > a which operate under specified conditions at different points in the grammar are necessary without radi-cal revision of the generative grammatical model. A rule such as this is similar to the ones Lakoff has called derivational or global con-straints [e.g. December 1969, LSA meeting] or Ross [1967] would call constraints that need to be put in a conditions box:

> ... they are not universal, and to state them on each
> transformation which they affect is to miss a generaliza-
> tion. What is necessary is that the grammar of every natural
> natural language be provided with a conditions box [under-
> lining is Ross's; BW] in which all such particular con-
> straints are stated once for the whole language. By a

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[10]There are such problems as the deletion of that in relative clauses and complement sentences in English and -na in relative clauses in Umbundu which might be appropriately viewed as the deletion of lexi-cal material.

> universal convention of interpretation, all conditions in
> the conditions box will be understood to be conditions on
> the operation of every rule in the grammar. ...
>
> [Ross   1967:4.3.2]

The Umbundu example makes the following question more than academic.
Obviously language-specific constraints, not being universal, must have
evolved by some means and are subject to change. Addition of these con-
straints to the theory of grammar is serious, in that they reduce the
power of the argument for ordered rules to account for syntactic facts
in language. The expansion of a language specific constraint in a
particular transformation throws into question the usefulness of these
conventions in examining a language in the process of change. In purely
descriptive terms, how do we maintain the generalization about o/a for
the relative, negative, and interrogative, and at the same time indicate
the generalization about the relative stated in (54b)?

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CONJOINED AND STACKED RESTRICTIVE RELATIVE CLAUSES:
DEEP AND NOT-SO-DEEP CONSTRAINTS IN LIGHT OF LUGANDA DATA[1]

Livingstone Walusimbi and Talmy Givón
Department of Linguistics
The University of California, Los Angeles

1. Introduction

This paper deals with the type of recursive rules which make possible
multiple recursion of modifiers within the noun phrase. It is primarily
concerned with the rule specifying embedding of sentences as relative
clauses, and more incidentally with the rule specifying sentence conjunc-
tion. We think we can demonstrate that both types of recursive rules are
needed in order to account for facts of both English and Luganda. We
would like to regard these recursive rules as constraint on the deep/
semantic structure. In addition, we would like to suggest that many
other constraints that may operate in the grammar of restrictive relative
clauses, and as a result of which several types of surface configurations
may be blocked--either universally or in some specific language, are best
construed as constraints on less-than-deep structure. Thus, while one
must seek to understand deep-structure constraints at least in part on
semantic grounds, one should not seek similar grounds to explain shallow-
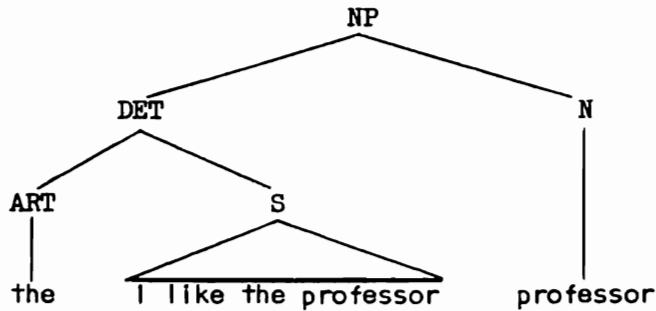structure or surface-structure constraints.

Over the past few years, several formulations have been proposed to
account for recursion of restrictive relative clauses (henceforth RRC)
within the framework of generative grammar. Most of them have been based
upon data derived almost exclusively from English. All of them were
formulated in terms of constraints on deep structure--i.e., as base rules.
Of these formulations, we shall discuss briefly only three, since it
seems to us that the rest are in one way or another variants of those.

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a. __The ART-S solution__. This solution may be found in Chomsky [1965].
For sentence (1) below, it offers the P-marker (2):

(1)   The professor (whom) I like . . .

(2)

```
                              NP
                   _____
                  DET                       N
              _____                 |
            ART           S                 |
             |      _____|_____           |
            the    I like the professor   professor
```

Proponents of this analysis claim that it captures the generality that,
in some senses, a RRC acts just like a determiner or article in narrowing
down the domain of the modified noun phrase, or __restricting__ it. However,
the solution is open to criticism on two fundamental grounds. First, it
may very well be that articles and determiners are __not__ deep-structure
categories, but rather derive from conventions involving larger __previous__
__discourse__, __reference__, and __presuppositions__. If this is indeed true, the
node ART in (2) cannot be a deep-structure node, and the node DET then
becomes superfluous, so that one may reduce the sub-rule responsible for
structures such as (2) to:

(3)   NP → (S) N

A more severe drawback, however, is the fact that a rule such as (3) (or
its predecessor responsible for (2)) is not by itself a __recursive rule__,
although it introduces the __recursive category-symbol__ S. Given this sym-
bol, one may obtain recursivity either through the S-conjunction sub-rule:

(4)   S → S and S (and S)*

or through further expansion of S to NP-VP etc. While rule (4) may ac-
count for __conjoined__ RRC's, rule (3) cannot correctly characterize the
recursivity involved in __stacked__ RRC's--i.e., that the first modifier
modifies only the head noun, while the next one modifies the already-
modified noun phrase. The necessity of assuming that stacked RRC's do

indeed exist will be discussed later on. Given a rule such as (3), however, sentence (5) below can only be characterized by the P-marker (6):

(5)   The man who was here whom I saw left

(6)
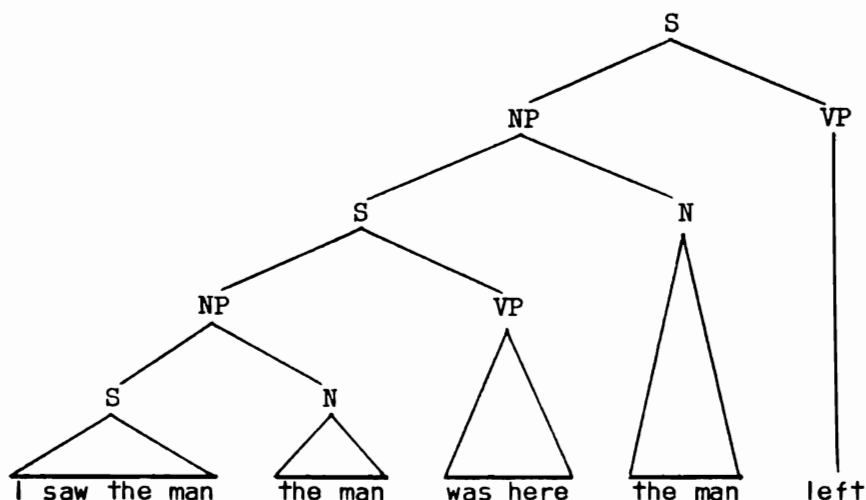
P-marker (6) portrays I saw the man as modifying the head noun of The man was here, not the already-modified noun phrase the man who was here. While it is true that an elaborate transformational machinery may permute (6) to yield the correct configuration, there exists a solution which would yield the correct configuration without recourse to that machinery.

b. <u>The conjoined solution</u>. Thompson [1971] has suggested that all relative clauses, including restrictive ones, arise from sentence coordination through a rule such as (4), not from embedding. She claims that (7) below is derived from the conjoined source in (8):

(7)   I met a girl who speaks Basque.

(8)   (I met girl).(girl speaks Basque)

Several explicit assumptions are associated with Thompson's analysis [1971:3-5]: (a) that <u>definiteness</u> is not a deep-structure category/ feature; or, in her words: ". . . that the choice of the definite determiner will in general correlate with certain presuppositions which the speaker makes about the extent of his listener's knowledge . . ."

(b) ". . . that the distinction between 'matrix' and 'constituent' sentences in relative clause structures can be seen to relate to nothing in the structural portion of the representation of such sentences . . ."

(c) ". . . the 'restrictiveness' of a relative clause is also shown not to be a property best described in terms of an embedding underlying representation . . ."

Thompson further claims that sentences (9) and (10) below are identical in meaning, as are also (11) and (12):

(9)   I met a girl and she speaks Basque.

(10)   There's a girl who speaks Basque and I met her.

(11)   I met a girl who speaks Basque.

(12)   A girl I met speaks Basque.

Implicit in her claims, however, is the assumption that structural features such as topic-comment and presuppositions are not part of the deep structure of utterances.

Thompson points out (in private conversation) that her solution can indeed characterize stacked RRC's, by the use of a transformational machinery that, given various presuppositions, would presumably convert a batch of conjoined sentences into the right stacked configuration. Presumably, the stacked interpretation will be then obtained by some surface structure interpretation rule.

The data from Luganda presented in this paper indicate that in that language one must account for at least the following surface configurations of RRC's:

(a) Three types of conjoined RRC's, with the conjunction manifested on the surface; and,

(b) Stacked RRC's, with no conjunction manifested on the surface.

Given Thompson's solution, the following machinery must be available for converting deep to surface structure in Luganda:

(a) Transformational rules which will be able to decide which conjoined
sentences are to be converted to conjoined RRC's, and which are to be
converted into stacked RRC's;

(b) Transformational rules converting some conjoined sentences into the
appropriate sequence of stacked RRC's;

(c) Rules of surface interpretation assigning the 'contrastive' meaning
to stacked RRC's.

None of these rules is needed in order to account for the data of Luganda
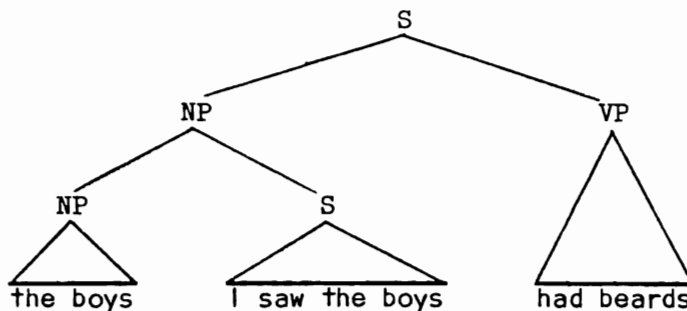in the alternative solution given below.

c. The NP-S solution. Several current formulations of this, notably
that of Ross [1967], generate RRC's through a recursive sub-rule such as
(13):

(13)   NP → NP S

For a sentence such as (14), this solution would assume the P-marker (15):

(14)   The boys I saw had beards

(15)

This analysis is probably closer to the surface facts of most languages
in which relative clauses follow the head noun (notable exceptions to
this are Basque, Amharic and Japanese), though this is not necessarily
relevant to its merits. Further, as we shall see below, this is the only
solution that characterizes structurally the stacked RRC's construction,
without recourse to added transformational or interpretative machinery.
Further, it characterizes properly the difference between stacked and
conjoined RRC's, the first arising from reapplication of the recursive
rule (13), the second from one application of rule (13) and then from
the sentence-conjunction rule (4).

2. Stacked restrictive modifiers in Luganda

Stockwell, Schachter and Partee [1969:471] have noted that for some native speakers of English a surface chain of RRC's can only be inter — preted as <u>conjoined</u>, but never as <u>stacked</u>. That is, in terms of the NP-S model described above and given rules (4) and (13), a recursive chain of RRC's is assigned only the structural interpretation (16), but never (17):

(16)
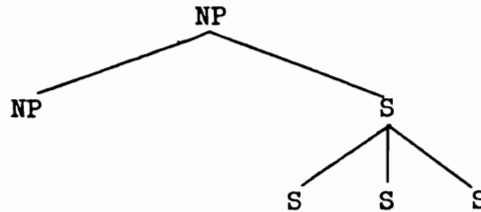
(17)
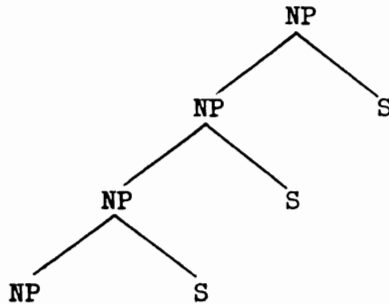
They further note, ". . . it appears that stacking of relative clauses may be a fairly deep kind of basis for dialect differentiation, such that some speakers have the ART-S deep structure (which is easily constrained against stacking), where others have some sort of N-S structure (here the distinction between the NP-S and NOM-S is of no consequence . . ." In other words, the difference between these 'dialects' is assumed to involve the base rules, i.e., it is ascribed to constraints on deep structure.

In this section we shall illustrate the existence of <u>stacked</u>-inter- preted relative clauses (and other modifiers) in Luganda. In a following section we will illustrate the existence of conjoined RRC's in Luganda. Eventually, by presenting evidence concerning various constraints on the distribution of stacked and conjoined restrictive modifiers in Luganda, we shall claim that constraints of the kind discussed by Stockwell,

Schachter and Partee [1969] should be best viewed as constraints on <u>less-than-deep structure</u>, but not on the base rules of the grammar.

One preliminary note must be given to modifying adjectives in Luganda. The rule of Relative Clause Reduction in Luganda, which pertains to embedded adjectives, and by which (18) below is embedded as a modifying adjective in (19):

(18)   omusajja mu-lungi
        man   good
  'the man is good'

(19)   omusajja o-mu-lungi a-genze
        man   good   left
  'the good man left'

is in many ways different from a similar rule operating in English. For one thing, the deletion of the <u>copula and tense marker</u> in the present tense is obligatory in Luganda, so that (20) is therefore ungrammatical:

(20)   *omusajja e ali (o)mulungi agenze
       man   who is   good   left
  'the man who is good left'

Further, there are strong reasons to believe that the initial vowel of the VCV-agreement prefix of the adjective (i.e., the o in o-mu-lungi), functions like a <u>relative pronoun</u>. This means that the Relative Clause Reduction rule deletes the copula but retains the relative pronoun. Since in Luganda the embedded adjective modifier <u>follows</u> the head noun much like relative clauses do, a formal distinction between embedded adjectives and relative clauses, as in English, is not as meaningful. This will be reflected at times in the English glosses given to Luganda adjectival modifiers, where we may use interchangeably adjectival (reduced) or relative clause (unreduced) translations.

Stacked restrictive modifiers in Luganda may obtain for relative clauses, adjectives and 'possessives' (we shall disregard other possibilities here). We will not attempt to illustrate here all possible combinations. Now, consider the following:

(21)   omusajja omu-lungi omu-nene a-genze

        man   good   big   left

'the <u>big</u> good man left'

(but not   the <u>small</u> good one)

Contrast it with (22) below, in which the order of the two modifiers has been changed:

(22)   omusajja omu-nene omu-lungi a-genze

        man   big   good   left

'the <u>good</u> big man left'
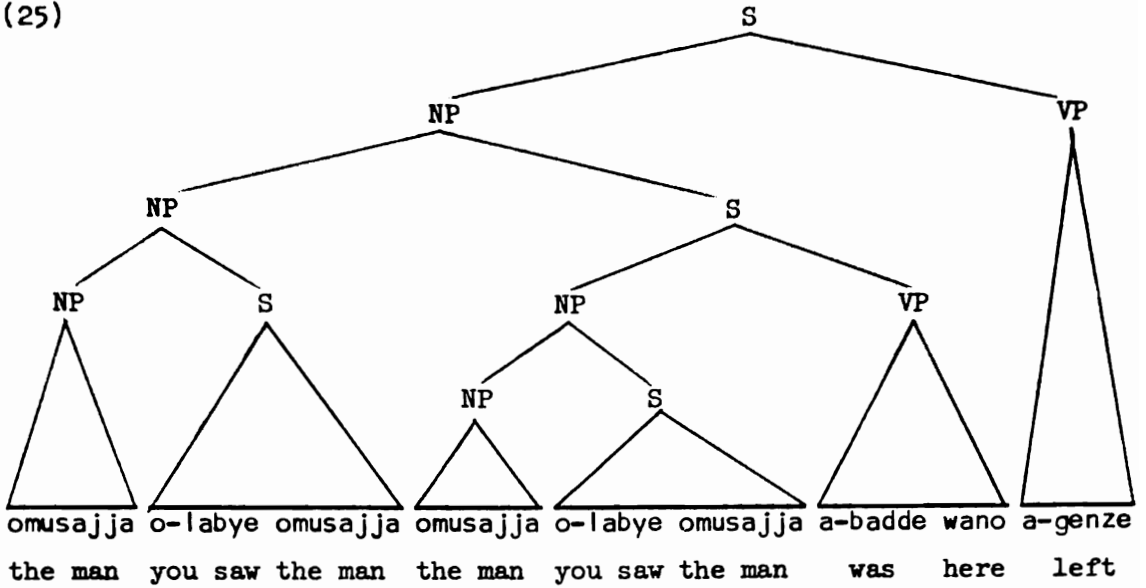
(but not the <u>bad</u> big one)

For speakers of Luganda a clear contrast in meaning exists, and the meaning change associated with the order change (and typical of all stacked chains of RRC's) can be rendered as with the following: while the modifier closer to the head noun modifies only the head noun itself, the one next to it modifies <u>the entire modified NP</u> preceding it. In other words, each added modifier in the chain further restricts the domain of the noun phrase.

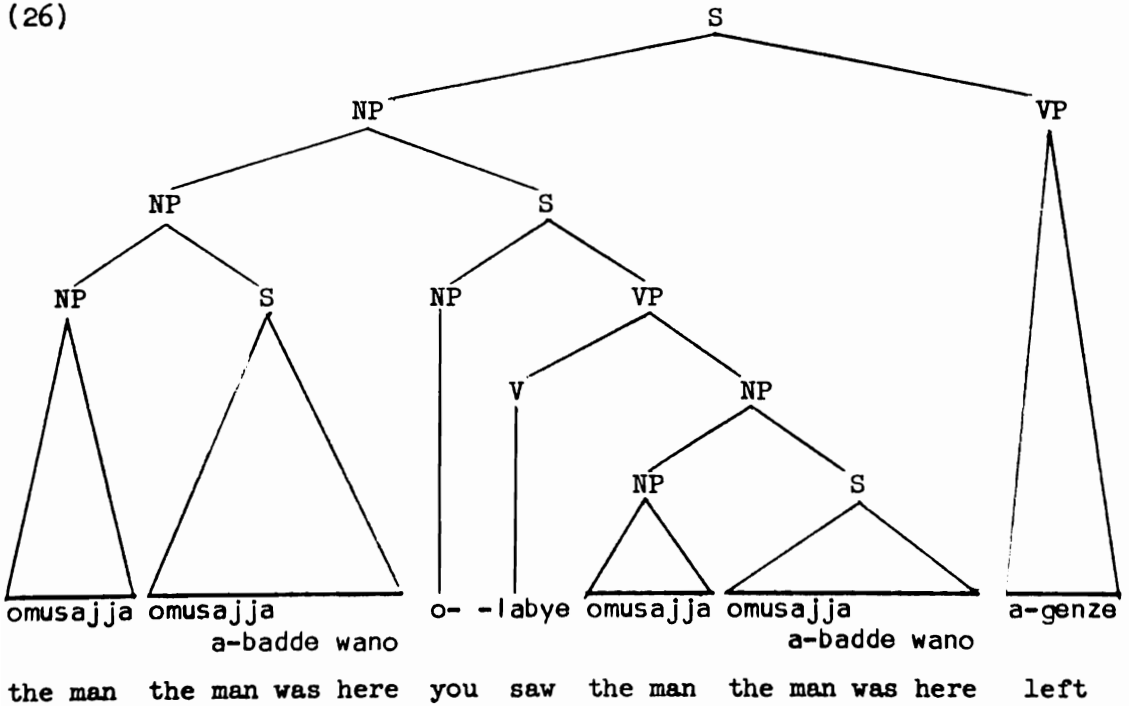   The same contrast may be obtained with unreduced RRC's:

(23)   omusajja gwe o-labye (e) a-badde wano a-genze

        man whom you-saw who   was   here   left

'the man whom you saw <u>who was here</u> left'

(but not the one whom you saw <u>who wasn't here</u>)

(24)   omusajja (e) a-badde wano gwe o-labye a-genze

        man   who   was   here whom you-saw   left

'the man who was here <u>whom you saw</u> left'

(but not the one who was here <u>whom you didn't see</u>)

Given the NP-S analysis, the difference between (23) and (24) above can be represented by the P-markers (25) and (26), respectively:

(25)


```
                                          S
                      NP                                    VP
            NP                      S
      NP          S          NP              VP
                        NP          S
 omusajja   o-labye omusajja  omusajja o-labye omusajja  a-badde wano   a-genze
 the man    you saw the man   the man  you saw the man     was   here    left
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(26)


```
                                      S
                    NP                                    VP
          NP                  S
    NP          S       NP          VP
                                V          NP
                                       NP          S
 omusajja omusajja      o-  -labye omusajja omusajja        a-genze
           a-badde wano                      a-badde wano
 the man  the man was here  you  saw the man  the man was here   left
```

The P-markers (25) and (26) above correctly characterize the semantic
interpretation of stacked RRC's, namely, that the second (stacked) modi-
fier does not modify the head noun alone, but rather the entire modified
clause preceding it.

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3. Conjoined restrictive modifiers in Luganda

There are two major types of conjoined RRC's construction in Luganda.
Before we turn to examine them, however, notice first that subject head
nouns may be ambiguous with respect to the feature [specific/generic].
We shall demonstrate this by using a construction with two stacked RRC's:

(27)   omusajja omulungi omunene mu-zira
           man   good   big   (is) brave

Sentence (27) above may be assigned one of the following interpretations:
(a) (specific): 'the big good man is brave'
(b) (generic):   'a/any big good man is brave'

Now, coming back to conjoined RRC's in Luganda, the first conjunction
type involved that of <u>simultaneous properties or events</u>. With the specif-
ic lexical conjunction ate nga, it may be used only to conjoin RRC's
which modify <u>generic</u> head nouns.[2] The second type is the conjunction of
<u>consecutive events</u> or, alternatively, of a <u>state and a consecutive event</u>.
It may be used only if the conjoined RRC's modify a <u>specific</u> (or <u>refer-
entially transparent</u>) head noun.

a. <u>Conjunction of simultaneous properties or events</u>. Note the following:

(28)   abasajja a-ba-kola <u>ate nga</u> ba-yimba ba-lungi
           men   who work   <u>and</u>   sing (are) good
       '(any) men who work and also sing are good'

(29)   abasajja a-ba-lungi <u>ate nga</u>   ba-nene   ba-zira
           men   who (are) good <u>and</u> (are) big (are) brave
       '(any) men who're good and also big are brave'
       'good, big men are brave'

The <u>generic</u> nature of the head noun involved is also evident from the
fact that it cannot take a Demonstrative modifier, so that (30) is un-
grammatical:

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[2]Under certain circumstances, with the use of the lexical conjunction
eera (or eera nga), it is possible to obtain structures in which the
conjunction of simultaneous events/properties modifies a <u>specific</u> noun.
(see section 4, examples (65), (66)).

(30) *omusajja ono omulungi <u>ate nga</u> munene mu-zira

      man   this   good   <u>and</u>   big   (is) brave

though without the Demonstrative, (31) is grammatical:

(31) omusajja omulungi <u>ate nga</u> munene mu-zira

      man   good   <u>and</u>   big   brave

    'a/any man who's good <u>and also</u> big is brave'

b. <u>Conjunction of consecutive events</u>. Observe the following:

(32) omusajja e ya-genze <u>ne</u> a-komawo mu-lungi

      man   who   left   <u>and</u> returned (is) good

    'the man who went <u>and then</u> came back is good'

   '*any man who left <u>and then</u> came back is good'

The second, generic, interpretation is of course a correct English sentence, but is the wrong interpretation for (32), where a <u>specific</u> head noun is obligatory. The <u>specific</u> nature of the head noun is also evident from the fact that it may be modified by a Demonstrative, as in:

(33) omusajja <u>ono</u> e ya-genze <u>ne</u> a-komawo mu-lungi

      man   <u>this</u> who left   <u>and</u> returned (is) good

    '<u>this</u> man who left <u>and then</u> came back is good'

One can also demonstrate the <u>consecutive</u> nature of this conjunction. Note first that the 'tense' is the second verbal in the conjunction must be the <u>narrative</u> (unmarked) tense; i.e., the stem -kola in (34) below is preceded only by the subject-agreement morpheme a-:

(34) omusajja e ya-genda ne <u>a-kola</u> mu-lungi

      man   who   left   and   <u>work</u>   (is) good

    'the man who left and then worked is good'

This is a rule of obligatory tense deletion, presumably under some conditions of <u>tense identity</u>, or perhaps conditions of <u>tense sequence</u>, i.e., that the tense in the second verbal indicates the <u>same or a later</u> time category than that in the first verbal. For this reason, all the alternatives in (35) below are ungrammatical, though semantically conforming to the sequentiality requirement:

(35)

$$\text{*omusajja e ya-genda ne} \begin{Bmatrix} \text{ya-kola} \\ \underline{\text{ya-koze}} \\ \underline{\text{a-koze}} \end{Bmatrix} \text{mu-lungi}$$

   man   who   left   and   worked   (is) good

By themselves, ya-genda 'left long ago', ya-kola 'worked long ago',
ya-koze 'worked within 18-24 hours' and a-koze 'has just worked'.
Thus, the violation responsible for the ungrammaticality of (35) is not
a <u>deep semantic</u> one, but rather a violation of the obligatory, late
(possibly even a <u>second-lexicon</u>) rule of equi-/sequi-tense deletion.
This rule probably applies to sentence-conjunction as well, so that while
the following, with an 'unmarked' tense in the second verbal, is
grammatical:

(36)   omusajja ya-genda ne a-kola

      man   left   and work

    'the man left and then (he) worked'

the following is just as ungrammatical as (35):

(37)

$$\text{*omusajja ya-genda ne} \begin{Bmatrix} \text{ya-kola} \\ \text{ya-koze} \\ \underline{\text{a-koze}} \end{Bmatrix}$$

   man   left   and   <u>worked</u>

In addition, one could also demonstrate that the constraint requiring
<u>sequentiality</u> (consecutiveness) is indeed a deep <u>semantic</u> constraint.
This may be done by choosing two events which may occur only in one
specific order, but not the other. Thus:

(38)   omusajja gwe na-laba <u>ne</u> m-mu-lamusa a-genze

      man   whom I-saw <u>and</u> I-greet-him   left

    'the man whom I saw and greeted left'

but not:

(39)   *omusajja gwe na-lamusa <u>ne</u> m-mu-laba a-genze

      man   whom I-greeted <u>and</u> I-see-him   left

    '*the man whom I greeted and then saw left'

There exists a stylistic variant, with somewhat less restricted distribution, for rendering the second (unmarked) verbal of the conjunction. It involves repeating that second verbal in its <u>infinitival</u> form (when contrasts exist, this variant seems to stress further the <u>consecutive</u> nature of the conjunction). In certain constructions this variant is obligatory, though in the following it is <u>optional</u>:

(40) omusajja e ya-kola <u>ne</u> a-yimba <u>ne oku-yimba</u> a-genze
      man who worked <u>and</u> sing <u>and to sing</u> left
   'the man who worked and then sang left'

(41) omusajja gwe na-laba <u>ne</u> m-mu-lamusa <u>ne oku-mu-lamusa</u> a-genze
      man   whom I-saw <u>and</u> I-him-greet <u>and to-him-greet</u> left
   'the man whom I saw and then greeted left'

Another interesting feature of this conjunction of <u>consecutive events</u>, is that it cannot be used to conjoin two adjectives, which in Luganda are all <u>stative</u> and thus may not be construed as events. So that the following is ungrammatical in Luganda:

(42) *omusajja o-mu-lungi <u>ne</u> mu-nene a-genze
      man who (is) good <u>and</u> big   left

Sentence (42) may be made grammatical with a slight adjustment, but then it ceases to be a conjunction of modifiers to the same head noun, and becomes a conjunction of two <u>non-coreferential noun phrases</u>, the second of which uses an adjective as an anaphoric head:

(43) omusajja omulungi ne <u>o</u>-mu-nene <u>ba</u>-genze
      man   good and big-one   left (pl. concord)
   'the good man and the big (one) left' (good man ≠ big one)

As to the level at which the constraint barring the conjunction of <u>stative</u> modifiers can be expressed, it seems clear that it could not be a surface structure constraint, since it holds true also for the conjunction of unreduced relative clauses containing the same adjectives (we here assume that modifying adjectives are indeed derived from those), so that the following is also ungrammatical:

(45) *omusajja e yali omulungi <u>ne</u> ali (o)munene a-genze

man who is good <u>and</u> is big left

Thus, the constraint is in some sense a <u>semantic</u> constraint in Luganda.
Sentence (45) above may again be slightly changed, to yield a grammatical
sentence--in which the conjunction is again of noun phrases (non-
coreferential) rather than of modifiers to the same head. That is:

(46) omusajja e yali omulungi <u>ne</u> a yali omunene ba-genze

man who is good <u>and</u> who is big left (pl.
concord)

'the man who's good and the (one) who's big left'

(the man who's good ≠ the one who's big)

There are grounds to believe, however, that the semantic constraint
on this conjunction type involved only the <u>non-stativity</u> of the second
conjoined modifier. This is apparent from the fact that (45) may be
changed into the grammatical (47) by substituting 'be' with 'become':

(47) omusajja e yali omulungi <u>ne</u> a-fuka omu-bi a-genze[3]

man who was good <u>and</u> become bad left

'the man who was good and then became bad left'

As to universality of the seemingly semantic constraint on this type
of conjunction, its validity is not readily apparent. Sentences such as:

(48) The man who was here today and there tomorrow . . .

The man who was brave one day and cowardly the next . . .

seem to be perfectly natural and in no way semantically 'odd'. This
opens an interesting question, one which we do not intend to fully answer
here. It has been customary in recent years to assume that deep (seman-
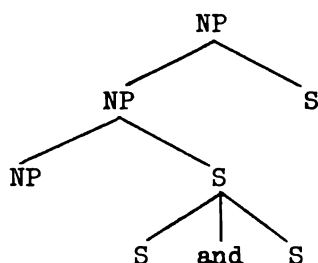tic) structure is more universal than surface structure. Could this be

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[3]There is probably a considerable difference between the lexical item
'be' in English and the copula -li in Luganda. English 'be' is
either ambiguous with respect to 'be' vs. 'become', or at least al-
lows elliptic uses which correspond to non-stative interpretations (see
Givón [forthcoming]). The Luganda copula carries only the meaning of
the strictly-stative 'be'.

also extended to the various <u>constraints</u> operating on deep versus less-than-deep structures? The data presented above, as well as some more to follow, suggest that an extension of this kind is by no means guaranteed. That is, that some semantically definable constraints (and thus, pre-sumably, deep structure constraint, within our frame of reference), may turn out to be of less than universal validity.
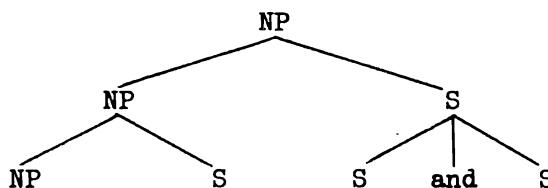
4. The stacking of conjoined modifiers

In the preceding two sections we have shown, separately, the two types of recursivity available for RRC's in Luganda: stacked RRC's and conjoined RRC's. We have suggested that a recursive rule such as (13), together with the sentence conjunction rule (4), can account for both types of recursivity. These rules predict, however, that at any 'stacked' node arising from the application of rule (13), conjunction may arise as a result of applying rule (4). That is, that structures such as both (49) and (50) below are possible (here one may also read 'interpre-tations' for 'structures', if one so wishes):

(49)

```
                    NP
                   /  \
                 NP     S
                /  \
              NP    S
                   /|\
                  S and S
```

(50)

```
                         NP
                       /    \
                    NP        S
                   /  \      /|\
                 NP    S    S and S
```

In the space below we will attempt to investigate these predictions, separately for the two conjunction types involved.

a. <u>The stacking of consecutive-conjoined RRC's.</u> In the case of this conjunction (with the lexical conjunction ne), structures (or interpre-tations) such as both (49) and (50) are indeed obtained:

(51)   omusajja gwe na-laba e ya-koze a-genze (stacked with no con-
         man   whom I-saw who worked   left   junction)

    'the man whom I saw who worked left'

(52)   omusajja gwe na-laba <u>e ya-koze ne a-yimba ne-okuyimba</u> a-genze (as
                                                              in (50))

         man   whom I-saw   <u>who worked and sing and to-sing</u> left

    'the man whom I saw <u>who worked and later sang</u> left'

(53)   omusajja e ya-koze gwe na-laba a-genze (stacked with no con-
         man who worked whom I-saw   left   junction)

    'the man who worked whom I saw left'

(54)   omusajja <u>e yakoze ne a-yimba ne-okuyimba</u> gwe na-laba a-genze (as
                                                           in (49))

         man <u>who worked and sing and to-sing</u> whom I-saw   left

    'the man <u>who worked and later sang</u> whom I saw left'

In structures (52) and (54) above, which involve conjunction as well as
stacking, the presence of a conjunction in no way interferes with the
characteristic stacked interpretation obtained.

b. <u>The stacking of simultaneous-conjoined RRC's</u>. At this point addi-
tional constraints begin to manifest their presence:

(55)   omusajja omulungi omunene a-kola nnyo (stacked with no con-
         man   good   big   works   hard   junction)

    'any good <u>big</u> man works hard'

(56)   omusajja omulungi <u>omunene ate nga mu-zira</u> a-kola nnyo (as in (50))
         man   good   <u>big   and   brave</u> works hard

    'any good man <u>who's big and brave</u> works hard'

(57)   omusajja omunene omulungi a-kola nnyo (stacked with no conjunction)
         man   big   good   works   hard

    'any <u>good</u> big man works hard'

(58)   *omusajja <u>omunene ate nga muzira</u> omulungi a-kola nnyo
          man   beg   and   brave   good   works hard

Further, on persistent examination, it turns out that the interpretation assigned to (56) above (i.e., assuming that it has some stacked structure in it), is also wrong and that, rather, the only interpretation assigned is a _three-way_ conjunction of all three restrictive modifiers; that is:
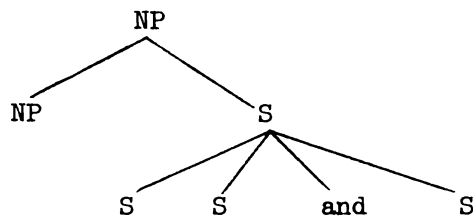
(56')   omusajja omulungi, omunene <u>ate nga</u> muzira a-kola nnyo

　　　　'any good, big <u>and</u> brave man works hard'

　　　　'any man who's good, big and brave works hard'

In other words, (56) is interpreted as arising from neither structure (49) nor (50), but rather from:

(59)

```
                         NP
                        /  \
                      /      \
                    NP        S
                            / /|  \
                           / / |    \
                          S  S and   S
```

We are thus left with a curious constraint on (at least) the distribution of surface strings in the presence of the ate nga conjunction (of simultaneous properties/events). It may be formulated the following way:

(60)   If a single conjunction of the <u>simultaneous</u> type is found to conjoin two RRC's in a longer chain of RRC's, the entire chain may never be interpreted as having a stacked structure (as in (49) or (50) above), but will always be interpreted as a <u>multiple conjunction</u> of RRC's (i.e., as in (59)).

Given constraint (60) above, the ungrammaticality of (58) may simply arise from a (probably universal) restriction on surface conjunctions of the form:

(61)   *A-and-B-C...

We have on purpose formulated constraint (60) as a surface-structure constraint. By that we only mean that it applies at a level of less-than-deep structure. An alternative would be, of course, attempting to

constrain the recursivity of rule (13) in some way; that is, regarding this constraint as a deep structure constraint. We feel this alternative is inappropriate, especially since constructions such as (49) and (50) seem in fact to be manifested in Luganda when the ne conjunction (consecutive) is involved. Rather, it may very well be that constraint (60) is in fact rooted in <u>perceptual strategies</u>, in the sense discussed by Bever and Langendoen [1970]. Thus, one may argue that the less-than-deep structure of (56) above:

(62)   [NP [REL REL ate nga REL]]$_{np}$

is indeed ambiguous with respect to the constraints on deep structure, i.e. given our rules (13) and (4). So that, in principle, given (62), two alternative structural interpretations are available to the Luganda speaker:

(63)   [[NP REL]$_{np}$ [REL ate nga REL]]$_{np}$ (as in (50), stacked)

(64)   [NP [REL, REL ate nga REL]$_s$]$_{np}$ (as in (59), non-stacked)

At the surface (or 'less-than-deep') structure level, however, constraint (60) operates, so that the speaker in fact assigns only the non-stacked interpretation (64).

There are several pieces of data which suggest that constraint (60) is not a deep structure constraint. First, notice that if a different structural type of a relative clause is involved (i.e., if it is not the case that all three modifiers are of the same internal structure), a stacked interpretation may be obtained in spite of the presence of a conjunction. For this, we need to digress a little.

We have noted earlier that the conjunction ate nga may conjoin only modifiers of <u>non-specific</u> head nouns. However, there exists in Luganda a conjunction of <u>simultaneous properties-events</u> which may conjoin the modifiers of specific head nouns, the conjunction eera. In the following example, the conjunction ate nga cannot be used (that is, the head noun must be <u>specific</u>) due to the presence of an object relative clause with a particular (non-generic) tense as well as a probably-referential

pronoun. However, if eera is used instead, a structural interpreta-
tion such as (49) is readily obtained:

(65) omusajja <u>omunene eera mu-zira</u> gwe na-laba a-kola nnyo

       man   big and brave whom I-saw works hard

    'the <u>big and brave</u> man that I saw works hard'

Constraint (60) is seemingly incorrect, then, since (65) seems to
violate it. One may of course argue that it is possible to re-formulate
(60) in terms of either the conjunction ate nga or, alternatively, the
<u>non-specificity</u> of the head noun. There are reasons to believe, however,
that it is not the <u>semantic</u> nature of the conjunction or the head noun
that is involved in this particular constraint, but rather the interac-
tion of universal perceptual strategies with respect to coordinate con-
structions. First, note that (66) below, which could have been, pre-
sumably, assigned both a <u>stacked</u> (as in (50)) and conjoined (as in (59))
interpretation, is assigned only a <u>conjoined</u> interpretation--in spite of
the fact that the first RRC is <u>not</u> of the same structural type as the
two conjoined ones:

(66) omusajja <u>gwe na-laba</u> omunene eera mu-zira a-kola nnyo

       man whom I-saw   big   and   brave works hard

   'the man <u>whom I saw, who is big and who is brave</u> works hard'

  '*the man whom I saw <u>who's big and brave</u> works hard'

We would like to suggest that the fact that (65) is assigned a stacked
interpretation while (66) is not, is due to the interaction of three
perceptual principles pertaining to the interpretation of coordinate
structures:

(a) A principle by which structures of the same structural type are more
likely to be interpreted as <u>conjoined</u> than structures of dissimilar
structural type;[4]

----

    [4]From notes of a lecture given by Thomas Bever at U.C.L.A. in May,
1970, we find: "In 'x...y conjunction, Z...', in which x,y,...z are
identical constituent types of type T, then the entire sequence is a con-
joined phrase of the type T..." as an example of a perceptual strategy
with respect to the assignment of conjoined interpretations.

(b) Constraint (61) proscribing conjoined structures of the form A-and-B-C . . .;

(c) Constraint (60), or at least the part of it which suggests that in the presence of <u>one overt conjunction</u> in a chain of modifiers, the entire chain is likely to be interpreted as <u>conjoined</u> .

We would further suggest that constraint (60) be reformulated and principle (a) above incorporated into it, to then read:

(67)   If a single conjunction of the <u>simultaneous</u> type is found in a
        chain of RRC's, and if all the RRC's in the chain are of the
        same structural type, then the entire chain may not be inter-
        preted as involving a <u>stacked</u> structure (as in either (49) or
        (50)), but only as a <u>multiple conjunction</u> of the RRC's (as in
        (59)).

    Let us now see how (67) and (61) can account for the facts of Luganda.
We shall assume here that they are <u>conjunctively</u> ordered with (67) apply-
ing first:

<u>Sentence (56)</u>:
    The structures of the RRC's are identical and a conjunction is pres-
ent; constraint (67) assigns a multiply-conjoined interpretation; con-
straint (61) does not apply.

<u>Sentence (58)</u>:
    The structures of the RRC's are identical and a conjunction is pres-
ent; constraint (67) assigns a multiple-conjunction interpretation; con-
straint (61) blocks it as ill-formed; both possible interpretations are
blocked, and the utterance is thus ungrammatical.

<u>Sentence (65)</u>:
    The structures are not identical, so that constraint (67) does not
automatically assign a multiply-conjoined structure; constraint (61),
further, blocks a conjoined interpretation altogether; the only inter-
pretation left is a <u>stacked</u> one, which is thus assigned.

Sentence (66):

The structures are not identical, but a conjunction is present; con-
straint (67) does not block a stacked interpretation; but constraint (61)
does not block a conjoined interpretation either; since the conjoined
interpretation seems to win over the stacked one, another principle govern-
ing the relation between (61) and (67) is required, namely:

(68)   If (67) and (61) allow both interpretations, the conjoined
        interpretation wins over the stacked.

Principle (68) can probably be incorporated as a modification of (67),
though for the moment we shall refrain from so doing.

5. Other surface-structure constraints on RRC's

In the preceding section we have argued that some constraints on the
distribution of stacked and conjoined modifiers in Luganda can be best
understood as perceptually motivated constraints on less-than-deep struc-
ture. In this section we would like to show that perceptual principles
as those invoked above, and in particular the principle of structural
similarity with respect to conjoined structures, play an important role
in constraining the output of RRC's in Luganda.

Note, first, that while one may stack restrictive adjectives in
Luganda, one may not stack two subject-relative clauses in a row:

(69)   omusajja omulungi omunene a-genze
             man   good   big   left
        'the big good man left'

(70)   omusajja e ya-kola a-genze
             man   who worked   left
        'the man who worked left'

(71)   omusajja e ya-yimba a-genze
             man   who sang   left
        'the man who sang left'

but not:

(72) *omusajja e ya-kola e ya-yimba a-genze
         man   who worked who sang   left

However, while stacking is blocked here, conjoining is not, and one
may obtain the following:

(73) omusajja e ya-kola <u>ne</u> a-yimba a-genze
         man   who worked <u>and</u> sing   left
      'the man who worked and later sang left'

(74) omusajja (e) a-kola <u>ate nga</u> a-yimba mu-lungi
         man   (who) works <u>and</u>   sings   good
      'any man who works and also sings is good'

(75) omusajja a-kola <u>eera</u> a-yimba mu-lungi
         man   works   <u>and</u> sings   good
      'the man who works and also sings is good'

A similar restriction holds with respect to object relative clauses,
which again cannot be stacked in a row--but only conjoined:

(76) omusajja gwe na-laba a-genze
         man   whom I-saw   left
      'the man whom I saw left'

(77) omusajja gwe na-lamusa a-genze
         man   whom I-greeted left
      'the man whom I greeted left'

but not stacked in a row:

(78) *omusajja gwe na-laba gwe na-lamusa a-genze
         man   whom I-saw   whom I-greeted   left

Though again, the conjunction of the same RRC's is permitted:

(79) omusajja gwe na-laba <u>ne</u> m-mu-lamusa a-genze
         man   whom I-saw   <u>and</u> I-him-greet left
      'the man whom I saw and then greeted left'

Now, notice that if one of the RRC's in the chain is a <u>subject rela-</u><u>tive clause</u>, while the other is an <u>object relative clause</u>, stacking be-comes permissible:

(80) omusajja e ya-kola gwe na-laba a-genze
     man   who worked whom I-saw   left
  'the man who worked <u>whom I saw</u> left'

(81) omusajja gwe na-laba e ya-kola a-genze
     man   whom I-saw who worked   left
  'the man whom I saw <u>who worked</u> left'

A similar <u>dissimilation</u> of structure may be also achieved with reduced adjectives:

(82) omusajja e ya-kola omulungi a-genze
     man   who worked   good   left
  'the <u>good</u> man who worked left'

(83) omusajja omulungi e ya-kola a-genze
     man   good who worked   left
  'the good man <u>who worked</u> left'

(84) omusajja gwe na-laba omulungi a-genze
     man   whom I-saw   good   left
  'the <u>good</u> man whom I saw left'

(85) omusajja omulungi gwe na-laba a-genze
     man   good whom I-saw   left
  'the good man <u>whom I saw</u> left'

It seems, then, that the principle of <u>structural similarity</u> acts here again as an important, though probably not sole, determiner of the speak-er's ability to interpret chains of RRC's as either stacked or conjoined. There is no apparent <u>semantic</u> reason for blocking sentences (72) and (78). Their interpretations in English are both grammatical ('the man who worked <u>who sang</u> left', 'the man whom I saw whom I greeted left'), at least for people who accept stacked interpretations. The fact that even for those people these interpretations are somewhat odd, is not at

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all surprising. It may very well be that the <u>same</u> perceptual mechanism
which causes a construction to be 'fully ungrammatical' in one language,
causes it to be 'only odd' in another. We shall return to this subject
below.

Finally, we would like to illustrate that this constraint could not
be a deep structure constraint. Notice that while it does not apply to
modifying adjectives (presumably derived from fully reduced relative
clauses), it does apply to relative clauses which carry the <u>same</u> semantic
interpretation:[5]

(86)   omusajja omulungi omunene ya-li mu-zira

        man   good   big   was   brave

    'the <u>big</u> good man was brave'

(87)   *omusajja e ya-li omulungi e ya-li omunene ya-li mu-zira

        man   who was   good   who was   big   was   brave

6. <u>Conclusions</u>

a. <u>Constraint on deep structures</u>. We have shown that of the three main
models available for describing the recursive, embedded structure of
restrictive relative clauses, only one--the NP-S model (as in Ross [1967])
is capable for fully accounting for the facts of Luganda (and, for that
matter, of English). Neither the ART-S model (as in Chomsky [1965]), nor
the conjoined model (as in Thompson [forthcoming]) can account for the
strong surface distinction between stacked and conjoined RRC's in Luganda
in quite as satisfactory a manner. In particular, these two models are
ill-suited for describing stacked RRC's. We would thus like to conclude

[5]Within the framework of a theory which does not wish to derive
adjectives from relative clauses, this would of course be an added argu-
ment against deriving the former from the latter. In our opinion, an
argument of this sort does not carry much weight in this case, since the
constraints in question may well turn out to be indeed perceptually
motivated--and applying to less-than-deep structures. This makes their
use for resolving arguments about deep structures highly questionable.

that our recursive rule (13) and the recursive rule (4) (conjunction), are the only deep structure constraints needed for the grammar of restrictive relative clauses.

b. Constraints on less-than-deep structures. We have also shown, we believe, that in addition to the two deep structure constraints (recursive base rules) mentioned above, other constraints are also relevant for determining the surface distribution of RRC's. These constraints are complex and subtle, and we do not pretend to understand them fully. From the data presented above, however, it seems reasonably clear that many limitations on the distribution and interpretation of chains of RRC's as stacked or conjoined are explicable in terms of constraints on less-than-deep structures. It is also likely, we believe, that these constraints may turn out to be perceptually motivated, in the sense elaborated by Bever and Langendoen [1970]. It is likely, further, that constraints of this type may operate not at one point, but perhaps at several points of less-than-deep structure. The indications for this are not fully clear, but the question is still open. As to the universality of these constraints, it may well turn out that constraints on less-than-deep structures are as universal as those constraining deep structures. This should come as no surprise, of course, since if they are indeed motivated by perceptual strategies, one would hardly expect those to be of less than universal validity.

c. Some reflections about constraints on RRC's in English. Stockwell, Schachter and Partee [1969] claim that many speakers of English cannot assign a stacked--but only conjoined--interpretation to chains of RRC's. They claim that this may be a constraint on the deep structure grammar of these speakers. We would like to diverge sharply from this claim. Given the facts discussed above, we would like to suggest that while the grammar of RRC's in English is the same for all speakers--and includes a recursive rule such as (13) which allows for stacking, speakers may differ as to the degree to which perceptual strategies actually intervene and block certain structural interpretation of surface chains of RRC's. It is a fact, for example, that speakers who do not accept a stacked

interpretation of <u>relative clauses</u>, accept more readily a stacked interpretation of <u>preposed adjectives</u>. This is extremely reminiscent of the facts of Luganda discussed at the end of Section 5, above. It also suggests that it is not a constraint on deep structures which blocks a stacked interpretation for these speakers, but rather a perceptually motivated constraint on less-than-deep structures.

It also seems that the constraints involving the principle of <u>structural similarity in conjunction</u> may be manifest in English in some fashion. For example, it seems that with structurally similar RRC's, the <u>conjoined</u> (88) **and** (89) are much more acceptable than the stacked (90):

(88)   The man who worked and sang . . .

(89)   The man who worked and then sang . . .

(90)   ?The man who worked who sang . . .

On the other hand, given the structurally dissimilar RRC's below, the stacked (91) and (93) seem preferable to the conjoined (92) and (94):

(91)   The man (whom) I saw who left . . .

(92)   ?The man (whom) I saw <u>and</u> who left . . .

(93)   The man who left whom I saw . . .

(94)   ?The man who left <u>and</u> whom I saw . . .

In short, it seems that perceptually motivated constraints of the kind we believe to exist in Luganda, may also exist in English.

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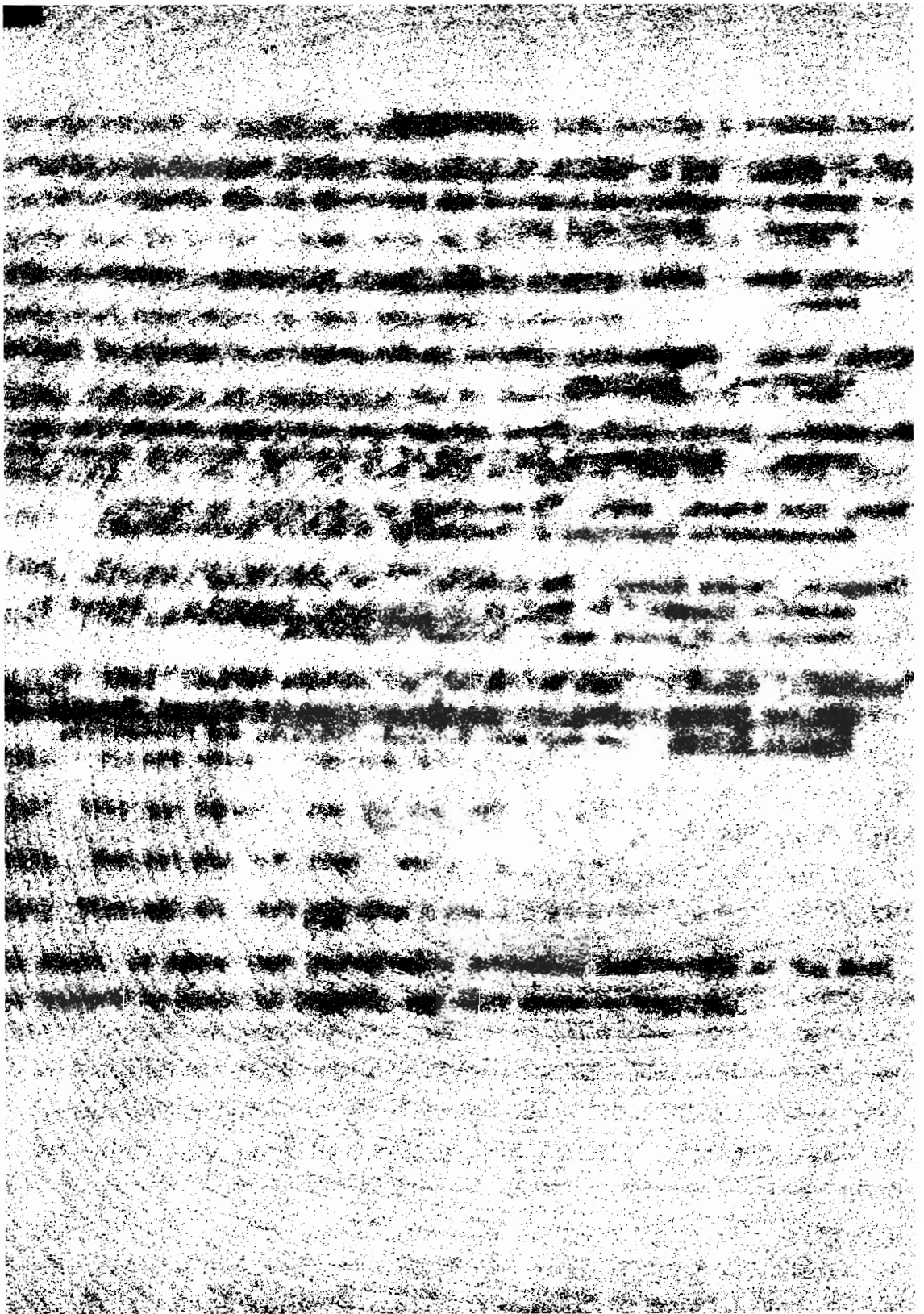
NOUN CLASS LEVELLING IN BAMILEKE[1]

Larry M. Hyman, Erhard F. K. Voeltz and Georges Tchokokam
Department of Linguistics
University of California, Los Angeles

It has long been known that African noun class systems are not an
isolated phenomenon in Bantu alone. Traces of noun classes have been
observed in virtually all of the postulated sub-branches of Niger-Congo,
with the possible exception of Mande. It is nonetheless true that a
sizeable proportion of Niger-Congo languages exhibit the properties of
a one-time universal system of noun classes (probably with prefixes and
suffixes denoting class membership--see Welmers [forthcoming] for
an exemplification of this position) that has by and large been reduced
to nothing in Mande and to an insignificant role in much of Kwa. Some-
how a complex noun class system was levelled, leaving groups of languages
still undeniably related to those languages maintaining such a system
(i.e. Bantu). How was this effected? What were the intermediate steps
involved? In the Bamileke cluster of languages in Cameroon may lie a
possible answer to these questions. Here we observe that in languages
traditionally qualified as Semi-Bantu or Bantoid much of the noun class
system they once shared with Bantu has been lost. In the Fe'fe' dialect
(spoken in the vicinity of Bafang) there are strong indications that the
remaining noun classes will survive no more than another generation or
two.

    In the following exposition we shall present data from Fe'fe' dialect
establishing a set of seven sg/pl noun class pairings (genders). Some
attention will be focused on three other Bamileke languages (Ngwe,
Bangangté, Bandjoun), which we have not personally investigated, but
about whose noun classes documentation is available from the literature.

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[1]We would like to thank the directors of the Nufi schools in the
Bamileke region of Cameroon for helping and encouraging us on many
occasions.

This paper is divided into three sections. In the first, the criteria
for distinguishing Bamileke noun classes are presented along with those
groupings we have arrived at. In the second section we discuss the
productivity of these noun classes. In the final section, Fe'fe' is
considered in the broader context of comparative Benue-Congo. It is our
contention that much of what we shall present actually occurred in some
form or another in many of the languages of Kwa (Igbo, Yoruba, Nupe) and
in Mande, resulting in the present absence of noun classes in these lan-
guages. Thus it is highly instructive to consider the status of
Bamileke noun classes.

1. <u>Noun classes in Fe'fe'</u>

In Bantu languages the noun class membership of a specific noun is
typically identified by its class prefix. In addition, complex processes
of concord in a variety of situations help to establish the identity of
a noun's class membership. In some Bamileke languages many of these con-
cord properties are maintained. Thus, as Dunstan [1966] reports, noun
class concord in Ngwe is observed in possessives, adjectives, demonstra-
tives, relatives, and a variety of other constructions. Nominals also
generally consist of a class prefix plus a noun stem. On the basis of
these phenomena it is possible to set up a system of noun classes in
Ngwe. Other dialects, however, do not mark the identity of noun class
membership as pervasively as in Ngwe. While Bangangté and Bandjoun seem
somewhat intermediate [Voorhoeve 1968], the only context in which the
full range of noun classes are differentiated in Fe'fe' is in the ob-
served concord of possessive pronouns. In most cases the original noun
class prefix has been lost--or, if it once consisted of a nasal conso-
nant plus a vowel, neutralized as a fully assimilated nasal prefix. We
shall witness the remaining function of this nasal prefix in our dis-
cussion of classes A and F below.

We now present the noun classes of Fe'fe' accompanied first by their
respective possessive pronoun concord, and second by their respective
noun class prefix, if any. These classes are exemplified in Table 1.

Class		Possessive Concord	Class Prefix
A.	sg.	∅‐́	(mɛ̀n)∅‐/N‐
	pl.	b‐	(pṵ̀)N‐
B.	sg.	m‐́	N‐
	pl.	m‐	N‐
C.	sg.	z‐́ʼ	∅‐
	pl.	m‐	N‐
D.	sg.	∅=	∅‐
	pl.	z‐	∅‐
E.	sg.	∅‐́	N‐
	pl.	z‐	N‐
F.	sg.	n‐́/l‐́	∅‐/N‐
	pl.	m‐	N‐
G.	sg.	∅=	∅‐
	pl.	m‐	N‐

Table 1

Fe'fe' Noun Classes

In the second and third columns a tone mark over a consonant (or ∅) de-
notes the tone of the immediately following vowel of the pronoun. [⁻]
denotes mid, ['] lower-mid and [`] low. Elsewhere ['] denotes high tone.
The tone is given only in the singular, since plural tone is predictable
(and invariant). In addition to A-G there are apparently four mass
classes in which there is no sg/pl alternation. Their concordial agree-
ment is identical to parts of A-G and are best seen as mass classes (i.e.
as classes of things that do not readily lend themselves to being
counted). We list these additional classes in Table 2.

Table 2

Fe'fe' Mass Classes

Class	Possessive Concord	Class Prefix
H.	z-́	∅-
I.	m-	N-
J.	∅-̀́	N-
K.	n-̀́/l-̀́	∅-

Table 3

Exemplification of Fe'fe' Noun Classes

Class	Noun		Possessive Concord		
A. sg.	mὲnǰwῑɛ	'woman'	nǰwῑɛ	∅-ὰ̀	'my wife'
pl.	pǖnǰwíɛ	'women'	nǰwῑɛ	b-ә́	'my wives'
sg.	sέn	'friend'	sέn	∅-ὰ̀	'my friend'
pl.	nsέn	'friends'	nsέn	b-ә́	'my friends'
B. sg.	nšw̌	'cane'	nšw̌	m-ὰ̀	'my cane'
pl.	nšw̌	'canes'	nšw̌	m-ә́	'my canes'
sg.	nә̀	'animal'	nә̀	m-ὰ̀	'my animal'
pl.	nә̀	'animals'[2]	nә̀	m-ә́	'my animals'
C. sg.	čwῑ	'bone'	čwῑ	z-ә́	'my bone'
pl.	nčwῑ	'bones'	nčwῑ	m-ә́	'my bones'
sg.	ŧhw̄	'tree'	ŧhw̄	z-ә́	'my tree'
pl.	nŧhw̄	'trees'	nŧhw̄	m-ә̀	'my trees'
D. sg.	sūo	'hoe'	sūo	∅-ǟ	'my hoe'
pl.	sūo	'hoes'	sūo	z-ә́	'my hoes'
sg.	wū	'thing'	wū	∅-ǟ	'my thing'
pl.	zhw̄	'things'	zhw̄	z-ә́	'my things'

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[2]The word for 'animal' is assumed to be derived from a nasal prefix
before a noun stem with initial /n/. There is a nasal cluster simplifi-
cation rule in Fe'fe': N+N → N in these cases.

Class	Noun		Possessive Concord		
E. sg.	mvū̄a	'dog'	mvū̄a	Ø-æ̀	'my dog'
pl.	mvū̄a	'dogs'	mvū̄a	z-æ̀́	'my dogs'
sg.	mvhī	'goat'	mvhī	Ø-æ̀	'my goat'
pl.	mvhī	'goats'	mvhī	z-æ̀́	'my goats'
F. sg.	kwā'	'ring'	kwā'	n/l-æ̀	'my ring'
pl.	nkwā'	'rings'	nkwā'	m-æ̀́	'my rings'
sg.	mbà?	'button'	mbà?	n/l-æ̀	'my button'
pl.	mbà?	'buttons'	mbà?	m-æ̀́	'my buttons'
G. sg.	thū	'head'	thū	Ø-ǣ̀	'my head'
pl.	nthū	'heads'	nthū	m-ǽ	'my heads'
sg.	khù	'foot'	khù	Ø-ǣ̀	'my foot'
pl.	nkhù	'feet'	nkhù	m-æ̀́	'my feet'
H.(mass)	zì?	'sweat'	zì?	z-æ̀́	'my sweat'
(mass)	lū̀a?	'yams'	lū̀a?	z-æ̀́	'my yams'
I.(mass)	nčīɛ	'saliva'	nčīɛ	m-æ̀́	'my saliva'
(mass)	nzāt	'feces'	nzāt	m-ǽ	'my feces'
J.(mass)	mvên	'grass'	mvên	Ø-æ̀	'my grass'
(mass)	nkɛ̀n	'news'	nkɛ̀n	Ø-æ̀	'my news'
K.(mass)	pè	'hate'	pè	n/l-æ̀	'my hate'
(mass)	pē	'tarrot'	pē	n/l-æ̀	'my tarrot'

Classes A-K are exemplified in Table 3, above, using the pronoun æ 'my'
to illustrate possessive concord.[3] Some of these classes contain a large
number of nominals (e.g. C, E, I), while others have very few members.
Note that some classes are distinguished primarily by possessive concord,
while others are differentiated by taking into the consideration the

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[3]All citations are given in semi-phonemic form, differing in some
detail from the orthography used by the Nufi schools in Cameroon. We do
not wish to ignore the residue not accounted for in our analysis. Thus
we cannot explain the tone in the singular pè? l-æ̀ (pl. mbə̀? m-æ̀́ 'my .
house/houses'.

pairing in which each class enters (the singulars of A and E or D and G are the same, though their respective plural differs). We shall return to this matter below. Note also for the moment that classes A and F (see Table 1) contain nominals differing in prefix. In the case of F, it is probable that we have a merger of two once distinct classes, one of which (as mbà? 'button') was characterized by a nasal prefix throughout, and one of which (as kwā? 'ring') was characterized by a nasal prefix only in the plural. In class A, we note the troubling fact from Table 2 that sɛn 'friend' does not have a nasal prefix in the singular, while njwɛ̌ 'wife' (and all other nouns of this class) do. (The optional pre-fixes mɛ̀n-/pừ- are discussed in Section 3.)

One final note is relevant to the noun classes we have just set up. There is a pair of kinship terms ('father' and 'mother') which although apparently belonging to class E (though not impossibly to class A), ex-hibit some anomalous characteristics in the possessive construction. In the singular possessor pronouns, illustrated now with respect to 'dog',

(1) mvū̄ɑ Ø-ə̀ə̀ 'my dog'

   mvū̄ɑ Ø-ò 'your dog'

   mvū̄ɑ Ø-ì 'his dog'

the following patterns are observed:

(2) mbā? + Ø-ō → [mbō?ō] 'my father'

   mbā? + Ø-ḕ → [mbḕ?ḕ] 'your father'

   mbā? + Ø-ā → [mbā?ā] 'his father'

   mā + ?-ō → [māvó] 'my mother'

   mā + Ø-ḕ → [mḕe] 'your mother'

   mā + Ø-ā → [māɑ] 'his mother'

Thus, whereas the normal singular possessive pronouns are æ 'my', o 'your' and i 'his, her, its', in these two cases only we find instead o 'my', e 'your' and ɑ 'his', not to mention the apparently supple-tive form of 'my mother'.[4] Our proposed explanation for these exceptional

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[4] We might attempt to explain [māvó] 'my mother' by positing a com-plex historical form: mā + vhừ 'parity' + o. This would also ex-plain the anomalous lower-mid tone by the productive rule of downdrift after a low tone in Fe'fe'.

kinship terms is given below. They are tentatively analyzed as belonging
to class pairing E, since they take z- concord in the plural. (We
understand, however, that some speakers use plural concord b-, that
which would classify these forms as class pairing A.)

2. Productivity of the noun classes

We have seen in the above tables the only means by which we can suc-
cessfully differentiate the noun classes of Fe'fe'. In this section we
would like to present data that would seem to suggest that the present
noun class system exists as such only as the result of an extensive level-
ling process. Much of what remains is also subject to levelling.

The first evidence of class merger is semantic. Only three of Fe'fe'
sg/pl pairings are fairly homogeneous in this regard: class A (comprising
a limited set of personal nouns), class E (in which we find an abundance
of animals) and class G (body parts). This is not to say that there are
no exceptions. Class A is exceptionless as it admits no non-human nouns,
but class E contains some non-animals, while other classes contain a lim-
ited number of scattered personal nouns and animals. However, it is con-
structive to view A and E as forming a (basically animate) class together.
We shall see the motivation for this below. Some class E members are:
ŋgāp 'chicken', muū̄a 'dog', nū 'snake', nǰwìe 'leopard', muhī
'goat', mbā? 'father', mā 'mother', nčie 'basket', and nkà? 'reed'.
Among the members in class G are: vǝ̄k 'bone', tɛ̀n 'buttock', vū̄?
'hip', sī 'face', thū 'head', pō 'hand', khù 'foot'. We have
found extremely few non-body parts in this class. Many other body parts
are to be found in class pairing C, although they form a minority in C
by virtue of the size of this class. Among these body parts are: čwī
'bone', zɔ̀k 'knee', kúa 'penis', zǝ̄k 'eye', zǝ̄k 'hip', tɛ̀?
'navel', lām 'tongue', sɛ̀? 'tooth', pɛ̄n 'breast', hā̄ 'armpit',
and ɣ̀ùa? 'cheek'. Finally--to complete those classes characterized by
semantic unity--all of the mass classes consist of either mass nouns or
abstract nouns, or both. Class I consists of the following elements:
nzā̄t 'feces', nčīɛ 'saliva', ngwā? 'salt', nzī 'nose' (= snot),
nɔ̀k 'hair', nkɔ̀p 'medicine' (=bark), nkwɛ̄n 'black-eyed peas', ndùa
'cloud', and nsìsì 'urine', among others. It may not be possible in all
cases to predict the noun class from the semantic nature of the noun, but

it is clear that if a noun is placed in this class (I), it is conceived
of as a mass--i.e. as something not to be differentiated by number. As
a final illustration, we stated above that few non-body parts occur in
class G. One example, hu̇ 'leaf', is to be found there. This noun is
quite noteworthy in that it changes meaning depending upon its class mem-
bership. When it is in class G its meaning is 'leaf'. When it is in
class H (a mass class), its meaning is 'medicine' (as from a leaf). One
other example: yē normally means 'ghost' when in its non-mass class (in
which it is sole member, part of the residue referred to in footnote 2),
but means 'breath' in mass class H again. However, as we shall now see,
this semantic productivity is extremely limited, suggesting that dif-
ferent semantic properties were blurred as the various noun classes merged
with one another.

We have been insisting that this noun class system is in the process
of dying out. One clear indication of this observation is that unless
Mr. Tchokokam has heard the possessive concord of a noun, he is unsure
and usually unable to assign it to a noun class. In this case, though
his uncertainty is always reaffirmed, he will tend to assign new or un-
familiar lexical items to class C. For class C is the generally produc-
tive class. All neologisms and borrowed words fit into this class. Thus
we observe the following borrowings from Pidgin English:

(6)   flāẁà   z-ǽ   'my flower'
        fâm   z-ǽ   'my farm'

This observation would seem to confirm our view that Fe'fe' noun classes
have largely lost their initial semantic significance, with the few noted
exceptions. If they hadn't, we would expect borrowings to fit into dif-
ferent classes according to their semantic content. Note however that
although 'flower' and 'farm' are considered to be mass nouns (they have
no plural), we ignore the possible debate over whether these should be
assigned to C, as we have done, or to H, since we shall later collapse
H with the singular of C. The important factor in this process is that
these words were not put into one of the other mass classes--notably
class I, which is the most developed in terms of numbers. In adopting

such words as they did, Fe'fe' speakers point toward another tendency of their language: the decline of sg/pl distinctions. We shall return to this issue below.

To summarize the discussion so far, the occurrences of noun class concord in Fe'fe' have been reduced to one context. For this reason the Fe'fe' speaker is often unsure (or ignorant) of the noun class identity of a given noun. In most environments in which there was noun concord in Proto-Bamileke, there simply is a lack of any grammatical agreement whatsoever. Thus, consider in (7), the set of pre-posed possessive pronouns, whose function differs only slightly from the post-posed pronouns we have thus far been considering.

(7) yàæ wúzā   'my food' (=my portion of the food)
     yò   wúzā   'your food'
     yì   wúzā   'his food'

     yō   wúzā   'our food'
     yī   wúzā   'your (pl.) food'
     yā   wúzā   'their food'

The pronouns in the first column are invariable. Not only do we always obtain y-, but also the tone is predictable: low for the singular set, mid for the plural person set. This should be compared with the postposed counterparts, for example: wúzā Ø-ǣ 'my food' (class D). There are no plural pre-posed possessive pronouns, such that 'my dogs' can only be mvū̄ɑ z-æ̀, and never *zæ̀ mvū̄ɑ. The decline of sg/pl distinctions is seen a second time.

In most cases we observe that one class has been generalized to replace all of the others. In anaphora, for instance, a complete gender (sg/pl pairing) has come to be used for all nouns, as we see in (8):

(8) mó? thū̄   'the other tree'   →   yì mó?   'the other one'
     mó? nthū̄   'the other trees' →   zì mó?   'the other ones'
     Cf.: yì bḕ 'this one', zì bḕ 'these ones'

Thus we see that the anaphoric pronouns are yì/zì for 'tree' (class C) as well as for nouns of all other classes, despite the clear resemblance

of these markers to the possessive concord of class E (and lo! Bantu 9/10).
This is not the only case where class E has become general. In relative
constructions we find that yì is employed, though covering both singu-
lar and plural (a third instance of sg/pl decline) as we see in (9):

(9)   mū   yì à kà   yí lá kà   šŵα

         child X he PAST see Y PAST leave   (X+Y = rel markers)

         'the child that he saw left'

         pū yì à kà yí lá kà šŵα

         'the children that he saw left'

 BUT: *pū zì à kà yí lá kà šŵα

In (4) we saw the concord in the singular possessor pronouns for 'dog'
(class E). Let us complete that table with the plural set of possessive
pronouns:

(10)   mvūα y-ò: 'our dog'
         mvūα y-ì: 'your (pl.) dog'
         mvūα y-à: 'their dog'

It seems reasonable to propose that the initial y- that we find in the
plural possessors originally comes from the singular of class E. In post-
nominal singular possessor pronouns ('my', 'your (sg.)', 'his'), we would
claim, the concordial element fell, leaving it intact only in the above
positions. (Compare the pre-nominal possessive pronouns in (7), where we
observe this y- in all persons, which we now identify as the singular
concord marker of class E which in this construction has been generalized
to all nouns.) Having recognized this process, we are now in a position
to explain the forms for 'father' and 'mother' in (5) above. Two proces-
ses are involved. First, Fe'fe' speakers chose, for whatever reason, to
use plural possessive pronouns ('our', 'your (pl.)' and 'their') for the
corresponding singular pronouns ('my', 'your', 'his') in the case of
'father' and 'mother'. One can imagine a cultural setting for such a
move, perhaps politeness of some sort. These plural forms, then, came to
be used indifferently for (semantic) singular and plural (e.g. 'my' and
'our'), as in (11):

(11) mbā́ʔ y-ò̄: 'our, my father'

      mbā́ʔ y-ì̄: 'your (sg/pl) father'

      mbā́ʔ y-à̄: 'their, his father'

In present day Fe'fe' these forms have only the plural interpretation.
The second step was that at the time when initial concord consonants fell
in the singular series of possessive pronouns, this y- fell, creating
once more a sg/pl person dichotomy in these exceptional pronouns. This
rule of consonant drop (which would have had to apply to the semantic
class of <u>singular</u>) left the way open for irregular vowel and tone assimi-
lation to yield two identical vowels with mid tone in series. Let us
take note in this explanation, that the form y-ě̀: for second person
plural is also heard and is perhaps more frequent than y-ì̄:, though
Mr. Tchokokam prefers the latter.

    Thus, to summarize, it is important to recognize that although we
have distinguished noun class pairings A-K on the basis of possessive con-
cord, this concord is recoverable in the singular possessed noun <u>only</u> in
the set of singular possessor pronouns. In other words, we can determine
the class membership of a noun in the singular only by looking at what
concordial prefix turns up in the frames: 'my X', 'your (sg.) X' and
'his X'. In other positions the concordial prefix is generalized to y-,
though it maintains the tone of the singular set of pronominal possessors.
Thus we observe the following:

(12) A. sɛ̄n y-ò̄: 'our friend'

          sɛ̄n y-ì̄: 'your (pl.)friend'

          sɛ̄n y-à̄: 'their friend'

     B. nšǔ̀ y-ò̄: 'our horn'

          nšǔ̀ y-ì̄: 'your (pl.) horn'

          nšǔ̀ y-à̄: 'their horn'

     C. thū̄ y-ō̄: 'our tree'

          thū̄ y-ī̄: 'your (pl.) tree'

          thū̄ y-ā̄: 'their tree'

    D. nǰwìɛ   y-ò: 'our leopard'

         nǰwìɛ   y-ì: 'your (pl.) leopard'

         nǰwìɛ   y-à: 'their leopard'

etc. (The tone of the plural possessor pronoun in class C concord is mid, despite the fact that the singular pronouns receive lower-mid tone. This has to do with the complex tonemic system of Fe'fe' and other Bamileke languages and does not seriously affect our statement that the plural pronouns receive a tone that correlates with the tone received by the singular series.) Thus we see that the actual marking of the possessive concord is even more limited than we have implied. Remembering that 'my tree' is ＋hū̄ z- æ̀, we should expect the form *＋hū̄ z-ō: 'our tree', but see from the above examples under C that a crucial aspect of possessive concord has already been lost.

In the examples we saw in Table 3, we observed that when the possessed nominal is singular, at least, the tone of the possessive pronoun depends on the possessed noun's noun class. Thus, classes A, B, E and F are all characterized as low-tone classes, while C, D and G are best seen at this time as non-low-tone classes (see Table 1). We find a tonal demonstration of noun class membership in noun plus noun associative constructions, which although incomplete (given only two possibilities: low or non-low), provides some indication of the direction in which the language is shifting. In Fe'fe' the _nomen rectum_ follows the _nomen regens_, which in the case of classes C, D and G undergoes a tonal uplifting (low becomes mid, lower-mid becomes mid and mid becomes high), as now illustrated in the singular of these genders:

(13) C. ＋hū̄ + mū̄ → ＋hú̄   mū̄   'the child's tree'

      D. wū̄ + mū̄ → wú̄   mū̄   'the child's thing'

      G. khù̀ + mū̄ → khū̄   mū̄   'the child's foot'

In classes A, B, E and F there is no tonal change:

(14) A. sɛ̄n + mū̄ → sɛ̄n   mū̄   'the child's friend'

      B. nšẁ + mū̄ → nšẁ   mū̄   'the child's cane'

      E. mvū̄α + mū̄ → mvū̄α   mū̄   'the child's dog'

      F. kwā̄ʔ + mū̄ → kwā̄ʔ   mū̄   'the child's ring'

In the above examples we have seen two different situations arising out of the decline of the different noun classes. First it was said that in many constructions where concord once was obtained there simply is a lack of any sign whatsoever. Thus there is no subject-verb agreement, no concord in demonstratives or subject relative pronouns. In the second situation, we observe that the concord marker of one class (e.g. class E in anaphora) is extended to cover all classes. Thus it would appear that in reducing the functional load of the various noun class markers, Fe'fe' had two options: first, to supress concord marking of any type, or second, to adopt one invariant form for all noun classes. We have yet another possible option.

In object pronouns (where we assume an original full concord marking), instead of choosing one class to extend to all occasions, a new alignment of animate versus inanimate has been obtained. The full set of (invariant) direct object pronouns is the following:

(15) æ 'me'   yo 'us'

o 'you'   yi 'you (pl.)'

i 'him, her'   yɑ 'them'

(Here tone depends on the tone of the verb form that precedes them.) We see from (15) that in the plural series it is once again (the singular of) class E (class 9 of Bantu) that has won out. All of these pronouns are invariant, but also semantically <u>animate.</u> (The consonant that sometimes appears before the singular series properly belongs to the verb stem that precedes it.) Thus, in the sentence

(16) à kà yí nī   (from /yīn/ + /i/)

he PAST see him

'he (recently) saw him/her'

the third person singular direct object can only refer to an animate being-- that is, 'him', 'her', or 'it' (an animal). If one should wish to say 'he saw it' where 'it' is [-animate], it is necessary to use the paraphrase 'he saw that thing' (= the thing in question),

(17)   à kà yí wū   lá

        he PAST see thing that

        'he (recently) saw that thing'

or, if the reference is clear enough, one can suppress the object
altogether:

(18)   à kà yí

        he PAST see

        'he (recently) saw (it)'

The same constraint holds for the third person plural 'them'. One says
'those things' or simply omits the pronoun.

     This distinction exists in other aspects of the pronominal system in
Fe'fe'. The third person pronouns 'his/her/its' and 'their' are limited
to [+animate]. The following set of subject pronouns is employed in the
case of animates:

(19)   n(gα)   'I'   pα   'we'

        o   'you'   pεn   'you (pl.)'

        a   'he, she, it'   po   'they'

(Once again, tone is not constant. While po is generally high, the o
others are usually low or rising.) Note that the plural pronouns appear
to have a prefix identical to the plural of class A (Bantu class 2),
which we have seen to be an animate (human) class (see footnote 5). While
a 'he, she, it' and po 'they' are exclusively [+animate], we find a
separate pronoun yæ 'it, they' used for inanimates. Its interesting
distinguishing characteristic is that while there is a singular/plural
distinction in animate subjects, this same yæ is used for singular <u>and</u>
plural, once again pointing toward the eventual obliteration of sg/pl
agreement in the language.

     Thus we have seen three different situations arising out of one pro-
cess: the levelling of noun classes in Fe'fe'. One interesting note
relevant to the second situation (where one class displaces all others)
is that where the singular of a class was generalized to all singulars

(as we saw class E employed for all plural possessor pronouns possessing
singular nouns), the corresponding plural (class E plural z- in this
instance) has not become generalized in the corresponding possession of
plural nouns. Instead, as we shall now see, the singular y- is in the
process of replacing all plural concords as well. Thus this process is
not best seen as a regular one.

In this sub-section, we shall now argue that the overt singular/
plural distinction in concord is breaking down in Fe'fe'. We have already
alluded to several instances where plural is no longer clearly distin-
guished from singular. For example, we have just observed that the in-
animate subject pronoun yæ is not differentiated for number, while in
other parts of the language such a distinction is still maintained. We
have all but lost the ability to determine the number of a noun from its
noun class prefix--while a prefixed N- marks the plural in classes A, B,
C, E, F, and G, classes B and E exhibit a nasal prefix in the singular
as well, while mass classes I and J also require a nasal prefix and have
already failed to distinguish singular and plural (despite the logical
possibility in many cases, e.g. ndùa 'cloud', class I). There are
other indications of the imminent loss of this distinction, all from the
behavior of possessive pronouns themselves. First, recent borrowed words,
as we have noted, come into the language undifferentiated for number--we
saw this in the case of 'flower' and 'farm'. Second, distinctions in
plural possessor pronouns have been largely wiped out. While the tone
of a possessor of a singular noun is predictable only from the individual
noun class (some are low, others lower-mid and mid), the tones of pro-
nouns possessing plural nouns have been completely regularized. The
singular persons always have lower-mid tone, while the plural persons
always have mid tone. We observe this in the following:

(20)   mvūᾱ z-ǽ   'my dogs'   mvūᾱ z-ō: 'our dogs'
        mvūᾱ z-ó   'your dogs'   mvūᾱ z-ī: 'your (pl.) dogs'
        mvūᾱ z-í   'his/her dogs' mvūᾱ z-ā: 'their dogs'

These tones are predictable in this way, despite the identity of the
noun class of the possessed nominal. Thus there has already been a

considerable amount of levelling underlying this simplification. This
situation has its correlate in the noun plus noun associative construc-
tion examined in the singular in (13) and (14) above. In the singular it
was seen that only in the case of some classes was there a tonal upstep
in this construction. In the plural, however, <u>all</u> possessed nouns under-
go such a tonal phenomenon. Thus, compare the uplifted tones in (21) to
their singular counterparts in (13) and (14):

(21)   A. nsɛ́n mū   'the child's friends'
          B. nšw̄ mū   'the child's canes'
          C. nthw̌́ mū   'the child's trees'
          D. zhw̌́ mū   'the child's things'
          E. mvw̌̄a mū   'the child's dogs'
          F. nkwá? mū   'the child's rings'
          G. nkhū mū   'the child's feet'

As the raising of this tone depends upon the non-low nature of possessive
concord, this is not surprising. It is explained by the generalization
illustrated in (20). The clearest indication, however, of the fate
awaiting the plural in Fe'fe' is that the widespread y- that we saw in
the plural series of pronouns possessing singular nouns has now come to
be used in plural persons possessing <u>plural</u> nouns as well. The following
forms are rapidly replacing the forms in the second column of (20):

(22)   mvw̄a y-ō: 'our dogs'
        mvw̄a y-ī: 'your (pl.) dogs'
        mvw̄a y-ā: 'their dogs'

This means that when this latter set is used, nouns in class D are un-
determinable for number as we see in (23),

(23)   sūo z-ō: 'our hoes' → sūo y-ō:
        then, sūo y-ō: = 'our hoe'/'our hoes'

while nouns in other classes can be interpreted as to singular or plural
solely on the basis of tone. (súo mū is also ambiguously 'the child's
hoe'/ 'the child's hoes'.) In addition, the functional load of the nasal

plural prefix in C and G is increased--it alone tells you if the noun possessed is plural or not, as in (24):

(24)   C.   nthū̃ m̩-ɔ̄:   'our trees'   →   nthū̃ y-ɔ̄:
               cf.   thū̃ y-ɔ̄:   'our tree'

        nkhù m̩-ɔ̄:   'our feet'   →   nkhù y-ɔ̄:
               cf.   khù y-ɔ̄:   'our foot'

But, Fe'fe' speakers fail in many cases to use the nasal prefix anyway. Nouns (such as unpaired body parts) that are not normally used in the plural have already become confused: the noun sɼ 'face' has an etymological plural nsɼ 'faces', but a Fe'fe' speaker may be unsure of whether 'our faces' is sɼ y-ɔ̄: or nsɼ y-ɔ̄:. All of these observations point to the likelihood that the plural, as a morphologically marked category, is fading out--as it has done elsewhere in West Africa.

3. Comparative Benue-Congo

We are now in the position to consider the task of reconstructing proto noun classes. Our task can be seen to entail two objectives: first, to reconstruct the noun class system that the proto-language of Bantu and Bamileke (henceforth, Bantoid) had, and second, to reconstruct the individual noun stems and designate the noun class to which each stem originally belonged. The first objective requires several considerations. Our procedure should be first to reconstruct Proto-Bamileke, its noun classes and noun stems, and then to expand our efforts to encompass more and more ground, linguistically. Unfortunately it would be premature of us to present any more than a few observations at this time. The Bamileke languages have been grossly neglected by all but a very few scholars in the field and the information available is scanty and not always adequate in quality. Although the Bamileke languages differ markedly in phonetic detail, a deep phonology (internal reconstruction) of each dialect would (according to all indications) lead us to many common underlying forms. Thus we have not only been able to posit certain Proto-Bamileke roots despite limited information, but also have had some success in relating these posited forms to Proto-Bantu. (For further discussion and exemplification, see Hyman and Voeltz [forthcoming].) In addition to setting up

the classes, we should want to isolate the semantic correlates associated with each class, if any. Also, we should want to provide the morphophonemic rules accounting for primary, secondary and tertiary concord, if applicable. Finally, we should provide the singular/plural pairings of these noun classes.

In this section we would like to reanalyze the noun classes we presented in section 1. We would like to do this while incorporating data from related languages. The forms of Ngwe, Bangangté and Bandjoun are from Voorhoeve [1968], although the Ngwe forms and correspondences to Bantu classes are attributed to Dunstan [1966]. The need for the Luganda forms (secondary concord in some instances) will become evident in a moment. The singular/plural pairings of the Bamileke forms correspond to those of the Bantu items. We now enlarge upon the table presented in Voorhoeve [1968] providing additional information from Comparative Bantu (from Guthrie [1967]), Luganda and Fe'fe':

(25) <u>Table 4</u>

Comparative Noun Classes

CLASS		Proto-Bantu	Luganda	Ngwe	Bndj.	Bngt.	Fe'fe' P.C.	Fe'fe' N.P.
1.	A	mu	mu/y/e	g̀	ỳ	(y)̀	Ø̀	(nɛ̀n)Ø/N
2.		ba	ba	b́	ṕ	(c)́	b	(pʉ̀) N
3.	B.	mu	mu/gu	g̀	ý	ỳ	m̀	N
4.		mi	mi/gi	ḿ	ḿ	ḿ	m	N
5.	C	di	li	d́	ts	ć	z'	Ø
6.		ma	ma/ga	ḿ	m̀	ḿ	m	N
7.	D	ki	ki	ź	ý	ý	Ø⁻	Ø
8.		bi	bi	b́	ṕ	ć	z	Ø
9.	E	ni	ni/y/e	z̀	ỳ	ỳ	Ø̀	N
10.		ni	ni/zi	ź	tś	ć	z	N
11. F		du	lu				l/ǹ	Ø
15. G		ku	ku				Ø⁻	Ø

(The plurals of classes 11 and 15 are identical to class 6.) Thus we have reanalyzed the classes referred to as A, B, C, D, E, F and G as 1/2, 3/4, 5/6, 7/8, 9/10, 11/6 and 15/6 respectively. Mass classes H, I, J and K are reanalyzed as 5, 6, 9 and 11. The remainder of this paper will be devoted to validating the correspondences seen in Table 4.

Let us first evaluate the assignment of the more conservative Ngwe nominal system to the Bantu classes listed in Table 4, positing correspondence rules wherever possible. The Ngwe forms show very strong correspondences to the Bantu system. There is first of all the d′ of class 5 corresponding to *di and the z′ in Ngwe to the Luganda zi of class 10. Ngwe class 3 g‵ corresponds to secondary concord gu in Luganda. Classes 4 and 6 are realized as m′, corresponding to mi and ma, respectively. In these cases (as opposed to class 3) the plural classes 4 and 6 have taken the basic noun prefixes for concord. Ngwe 2 and 8, both of which are realized as b′, furnish a clear correspondence with Bantu ba and bi, respectively. Thus we are able to provide a number of correspondence rules, seen in (25):

(26)   CR1   PB *mV   :   Ngwe m / ... ___ ...

          CR2   PB *bV   :   Ngwe b / ... ___ ...

          CR3   PB *di   :   Ngwe d / ... ___ ...

          CR4   PB *gV   :   Ngwe g / ... ___ ...

(CR1 is to be read, for example: 'Proto-Bantu *mV corresponds regularly to Ngwe m in a given environment.') It is not clear that Guthrie's reconstructed form for class 10, *ni, is the correspondence for the Bamileke forms in Table 4. It is doubtful that *ni would correspond to z. Rather we recognize PB *dịni of which it is the *dị (Cole's class 8x) that corresponds to Ngwe z:

(27)   CR5   PB *dị   :   Ngwe z / ... ___ ...

The nasal prefix of class 10 nouns is seen as deriving from the *ni part of our reconstruction.

Most important about these rules is the fact that even within the noun class systems of languages which have lost most distinctions we can find

regular correspondences. This fact raises serious questions regarding
the status of Bamileke languages vis-à-vis Bantu, particularly in view
of Guthrie's claim that it is sufficient to classify a language as Bantu
if it shows regular correspondences in the noun class system and if it
shows a sufficient number of correspondences with Common Bantu roots (see
Tucker [1964:215] for the first discussion of these criteria). That
these criteria, although arbitrary in some respect, can be satisfied
for the Bamileke languages is certainly demonstrable [Hyman and Voeltz,
forthcoming].

The case for the Fe'fe' noun classes and their assignment to corres-
ponding Bantu classes is perhaps a little less obvious. We have sug-
gested a number of reasons for this above, namely, the large extent to
which noun class distinctions in Fe'fe' have been and are being levelled,
leaving considerably less traces than in Ngwe. Nevertheless we have
assigned correspondence pairs to Bantu classes 1/2, 3/4, 5/6, 7/8, 9/10,
11/6 and 15/6. We will review the evidence presently.

As in Ngwe, PB *bV (e.g. class 2 *ba) corresponds to b in Fe'fe'
(see discussion of class 8 below). We can therefore extend CR2 as
follows:

(28)   CR2'   PB *bV : Ngwe b : Fe'fe' b / ...____...

(CR2' should properly be understood as correspondences between PB and
Proto-Bamileke.) Also as in Ngwe, PB *mV corresponds to Fe'fe' m:

(29)   CR1'   PB *mV : Ngwe m : Fe'fe' m / ...____...

Given CR1' and CR2' we have classified A and B as 1/2 and 3/4 respec-
tively.

Where Ngwe has maintained a distinction between the behavior of
super-closed i (i̧) and i (i), Fe'fe' has generalized on the be-
havior of i̧, allowing palatalization of d to z before *i̧ and
*i (before or after their ultimate merger). Thus:

$$(30)\quad CR3'\begin{bmatrix} PB & *di̧ \\ PB & *di \end{bmatrix} : \begin{bmatrix} Ngwe & z \\ Ngwe & d \end{bmatrix} : Fe'fe'\ z \begin{bmatrix} /...\_\_\_... \\ /...\_\_\_... \end{bmatrix}$$

Accordingly we can relate classes C and E to 5/6 and 9/10, respectively. Additionally we observe that the nouns of class I are mass nouns, that their noun concord is a nasal, and that their concordial agreement is that of the plural of C, and thus class 6. Conversely, class H corresponds to the singular of C, and thus class 5.

What about the possessive concord in class 1 in Fe'fe'? According to CR1' we would expect m. Notice, however, that class 1 and class 9 possessive concords are identical, namely ∅̀, pointing toward the possible (historical) relationship between classes 1 and 9. (We return to this question below.)

In addition to accounting for the concord markers, we must also be prepared to explain the presence or absence of nasal prefixes in the various classes. We may predict them on the basis of the Bantu noun class correspondences we have supported. Let us assume that the underlying form for the prefixes of classes 3, 4 and 6 is m. This m is realized as /m/ before a vowel (as in possessive concord), but is assimilated to the following consonant by the rule in (31):

(31)   [+nasal]   →   [α position] / ___ [α position]
          C   C

(In the case of would-be NN clusters, these are simplified to single nasal consonants.) Observe that this rule extends also to class 9 (and of course class 10, which differs solely by the addition of dḭ) where a presumedly underlying /n/ is also assimilated to the following consonant.

Within the classes so far related to Bantu forms, there exist a number of problems. First, what is the source for the possessive concord in classes 1 and 9? Second, class 1 nouns normally have a nasal prefix, but there is at least one clear example lacking such a prefix (sɛn 'friend'). Are we to recognize two genders, both of which have the same concords, but which are distinguished by the presence or absence of a nasal? We would have to sub-divide 11/10 in the same way (see Table 1). Although this position would be consistent with our methodology, it is not clear to us how we might predict the concordial agreement in these

classes other than assuming that they have the same cognates in Bantu, thus bringing us back to our first analysis. Finally, what is the source for the prefixes mèn- and pù in classes 1 and 2? It is not certain that these forms are cognate to any Bantu forms. If they cannot in fact be related by rule, this would lead to some interesting speculation: it has been argued [Givón forthcoming] that Bantu class 1/2 is a Bantu innovation, by splitting class 9/10 and assigning most [+human] nouns to class 1/2. Is it possible then, that Bamileke experienced a parallel development? On the other hand the forms mèn- and pù- are quite close to their hypothetical counterparts *mu and *ba. (Bantu *b does in fact correspond to Fe'fe' [p].) Does this then suggest that the creation of class 1/2 preceded the Bantu-Bamileke split (as Givón concludes) and that 1/2 has to be in fact reconstructed for what we term 'Bantoid'? All indications point in this direction. In Voorhoeve and de Wolf [1969], for example, the cognates of Bantu 1/2 in Bantoid are the most frequently occurring classes. All the instances of nasal prefixes in nouns of classes 1 and 2 can be argued to be transfers from classes 9 and 10, retaining their original prefix (n-), but adding the noun prefixes of 1/2. The mèn/pù prefixes of Fe'fe' 1/2 curiously resemble the sg/pl pair wèn/pù 'person/persons'. (In most dialects 'person' is mèn, so we needn't concern ourselves with this detail.) Thus we would have to conclude that some kind of compounding has taken place to create 1/2 from 9/10. This remarkable instance seems not too distant from the type of evidence one has longed for in the quest for deeper insight into Bantu noun class creation. At this point, we take note of the potential importance of Fe'fe' 1/2 and refrain from further speculation.

Bamileke 7/8 corresponds less obviously to Bantu *ki/*bi. The first piece of evidence for class 8 is that we find b´ in Ngwe. Secondly, we find that class 8 is realized as zi in some Bantu languages (e.g. Zulu) as it apparently is in Fe'fe'. We suggest that this z has its source in *bi, where the super-closed i has palatalized the *b [β]. We favor this over Cole's proposed class 8x di, since we obtain b in Ngwe and can motivate a change of the form,

(32)   PB *bɨ̣ [βɨ̣]   →   Fe'fe' z

as we see in the correspondences:

(33)   PB *bɨ̣na[5] 'to dance'   :   Fe'fe' zɛ̄n 'to dance'

(See Hyman and Voeltz [forthcoming] for further discussion.) Also keep
in mind that PB *ba is reflected as b[6] in Fe'fe'. We can therefore
propose that Bantu *b is cognate to Fe'fe' b before a, and z be-
fore ɨ̣. Class 7, however, is not as clearly demonstrable. We note that
Fe'fe' 7 is identical to what we are calling Fe'fe' 15. We are assuming
that these are the correct cognates to the Bantu classes partially on the
grounds that there are Bantu classes which group in the same manner, i.e.
7/8 and 15/6. But we are also considering some more substantive evidence
in this assignment. We see from Table 4 that both 7 and 15 are realized
as Ø⁻ in Fe'fe'. We have noticed that Bantu prefixes containing nasals
are reflected as nasals and that those containing voiced consonants in
Bantu have reflexes in b, d, z or l (class 11, as we shall see) in
Fe'fe'. There are no cognates with Bantu prefixes which contain voice-
less consonants. We therefore, by elimination, have the option of as-
signing those nouns taking Ø⁻ concord to Bantu 7 (*ki), 12 (*ka),
13 (*tu) or 15 (*ku). In the case of those nouns taking class 8
plural, we feel that 13 is out on the grounds that it is basically a
plural or mass class. We know of no Bantu language which has the plural
class 8 and does not have as its singular counterpart class 7. Class 12
is certainly a possibility, but again we are excluding it because of the
absence, to our knowledge, of any Bantu language which pairs it with any
class other than 13 or 14. Similarly, class 15, to the extent that it
is not a mass class, pairs with 6 in Luganda and ChiBemba and a number
of other languages. Furthermore, in Bamileke, it contains mostly body

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[5]*bɨ̣na is equivalent to the reconstructed form given by Carl
Meinhof. 1932. <u>Bantu-Phonology</u>. Berlin. N.J. van Warmelo, translator.

[6]In Fe'fe' underlying /b/ is realized as [p] as in the following
rule: b → p / #. That is, at the beginning or end of a word.

parts, again paralleling the Luganda and ChiBemba class. By accepting 7/8 and 15/6 as such for Fe'fe', we assume that at some stage 7 and 15 merged, perhaps after the loss of initial *k in both cases. One indication of this is the pair wū/zhū 'thing/things' in which the prefixes of 7/8 irregularly remain before a stem consisting of a hypothetical ū.[7] Most other Bamileke dialects exhibit a palatal consonant in the singular form, such as Bangangté yú, where we see that in addition to the loss of *k, the typically Bantu gliding rule i → y operates. We might explain the form wū for class 7 in Fe'fe' (where we expect yū) by hypothesizing that 7 and 15 merged as 15 (where *k falls and u → w). This solution does, of course, need further validation.

Finally, class 11 has no noun prefix, that which we would expect for a non-nasal cognate such as Bantu *du. It has n alternating with l. The l can be related to PB *du by regular correspondence, while we note that [l] and [n] often occur as free variants in Bamileke [Hyman and Voeltz, forthcoming].

4. Summary

In the present paper we have shown that the seven genders which must be recognized for Fe'fe' can be treated as twelve morphological agreement classes, all of which are cognate to Proto-Bantu forms. We have also seen cognate forms from Ngwe, Bangangté and Bandjoun from Table 4. Although it is somewhat premature to consider the implications of this study on the Proto-Bantoid noun class system, we would like to suggest that it is very unlikely 1) that Bantoid as a whole fully matches the inventory of classes of Proto-Bantu (i.e. Bantu may have innovated a number of classes after its separation from Bantoid); and 2) that no more than ten or twelve classes will ever be reconstructable for Bantoid.

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[7]The [w] in 'things' is assumed to be the result of the rule: iu → w. This rule is discussed in Hyman and Voeltz [forthcoming].

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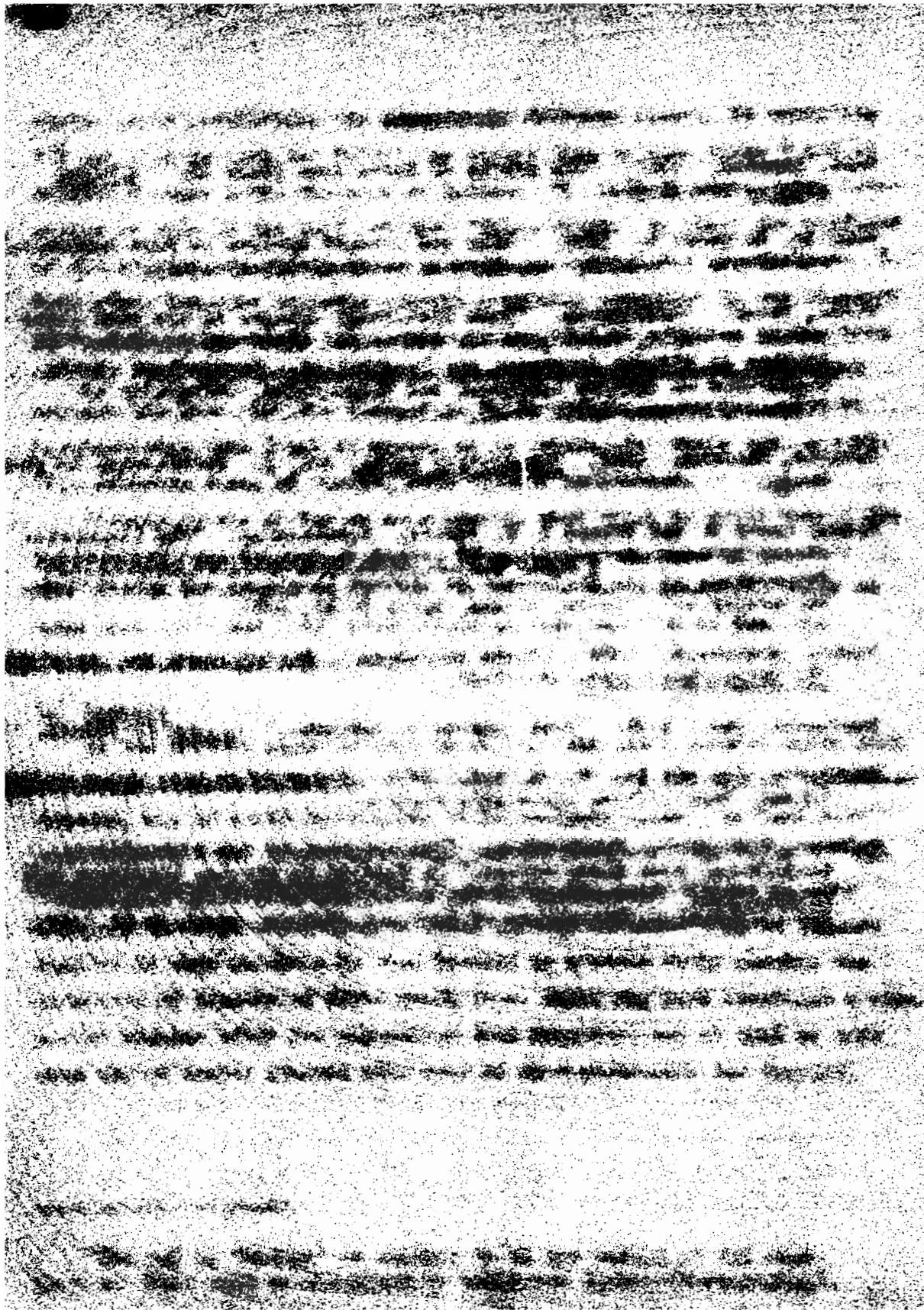
SONRAI CAUSATIVES AND PASSIVES: TRANSFORMATIONAL
VERSUS LEXICAL DERIVATIONS FOR PROPOSITIONAL HEADS[1]

Tim Shopen and Mamadou Konaré
Department of Linguistics
Indiana University

1. Sonrai verbs of the form STEM + NDI

Diré Sonrai has a number of verbs of the form STEM + NDI where the
stem is itself a verb. Consider variations on the verb ŋa 'to eat':

(1)   STEM WITHOUT SUFFIX

         Musa ŋa tasu di NP_1 V NP_2

         Mousa eat rice the

         'Mousa ate the rice.'

(2)   STEM + NDI: THE DIRECT CAUSATIVE

         Ali ŋandi tasu di Musa se NP_3 V + ndi NP_2 NP_1 se

         Ali feed rice the Mousa to

         'Ali fed the rice to Mousa.'

(3)   STEM + NDI: THE INDIRECT CAUSATIVE

Ali ŋandi   Tasu di Musa se NP_3 V + ndi NP_2 NP_1 se

Ali cause-to-eat rice the Mousa to

'Ali had Mousa eat the rice.'

(4)   STEM + NDI: THE PASSIVE

Tasu di ŋandi NP_2 V + ndi

rice the be-eaten

'The rice was eaten (by someone).'

In Sonrai there is no equivalent of the English by phrase, e.g. no
way to say "The rice was eaten by Mousa", only "The rice was eaten".
The existence of an AGENT is understood in (4), even though it cannot be
expressed.

2. Direct versus indirect causation

The names we have given to the two causatives refer to the semantic
role of the subjects of the sentences in which these verbs are used.
Having indirect causatives expressed in simplex sentences is unusual al-
though not unheard of in the languages of the world.[2] The more usual
situation is to have direct causation expressed in simplex sentences and
indirect causation in complex sentences.[3]

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[2]L. Maran has informed us (personal communication) that Kachin, a
Tibeto-Burman language, has a parallel process. There is a productive
process of prefixation on verb stems that produces causative verbs some
of which are ambiguous in just the way Sonrai causatives can be, e.g.
[kʰrat] 'to fall' becomes [jəkʰrat] meaning either 'to drop' or 'to
cause to fall'. Fred Householder reports that Turkic, Japanese and
Korean have indirect causative verbs.

[3]English has no verb like ŋandi 'to cause to eat' with the combined
meaning of indirect cause plus some additional element of meaning de-
noting the action that is caused. Indirect causation is typically ex-
pressed in complex sentences with matrix verbs like cause, make, force,
have and persuade, where there are at least two propositional heads,
the main clause verb and the subordinate clause verb. The verb cause
can express indirect causation in a simplex, but a second propositional
head has to be expressed or understood, e.g. with a nominalization as
object, John caused the explosion; note the peculiarity of ?John
caused the tree--explosion is a propositional head while tree isn't.

The subject of a Direct Causative (DC) is the immediate or determinant
cause. In Sonrai, as in English, feeding someone something entails rather
than asserts that person's eating it. Corresponding to this is the fact
that the only NP understood as AGENT in (2) is Ali, the causative sub-
ject. Musa, the one who gets fed, is GOAL.[4] In the Indirect Causative
(IC), on the other hand, the subject is the indirect or antecedent cause
of the event. Causing someone to eat something asserts that he eats it:
In (3) two AGENTs are understood, Ali, the causative subject, and
Musa who initiates the eating. In fact, both Ali and Musa are

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Cf. Hall [1965] on the indirectness of cause. George Lakoff (personal
communication) reports that there are other kinds of cause besides the
two defined in the direct/indirect dichotomy, probably four in all.
A more abstract analysis of the semantic functions AGENT and INSTRUMENT
would reveal them to share a feature of direct causation. What Gruber
[1965] calls CAUSATIVE AGENT, PERMISSIVE AGENT and INSTRUMENT respectively
could be analyzed with binary features as [+CAUSE, +RESPONSIBILITY],
[-CAUSE, +RESPONSIBILITY] and [+CAUSE, -RESPONSIBILITY]; any verb or
other propositional head with a CAUSATIVE AGENT or INSTRUMENT would be
thereby "causative". When this paper was presented Getatchew Haile
pointed out that -ndi in all its occurrences, including passive, is
a marker for the presence of some kind of cause, direct or indirect,
and could be called a causative marker. This would work except for in-
stances of the passive (which we did not discuss in our presentation)
where the generalization does not appear to hold, e.g. the passive of
any stative verb like gunandi 'be seen' from guna 'to see' where in
our analysis there is no association with a semantic function of cause,
no AGENT or INSTRUMENT.

[4]We are indebted to Fillmore [1968] and Gruber [1965] for their many
insights into the semantic primitives necessary to capture grammatical
relations. We borrow terminology from both of them. The essential dif-
ference in our system is that we build the semantic representations in-
to our lexical entries. Their systems involved doing the same thing
twice. They put semantic labels on the nodes of the trees in the under-
lying representations and then built the same information into the lexi-
cal entries for verbs to insure proper lexical insertion. This obscured
the syntactic properties of underlying representations. The correspond-
ences between semantic functions and syntactic configurations in lexical
items is a link between two different kinds of systems. The semantic
system has different regularities from the syntactic, but an important
part of the semantic system converges with the syntactic in lexical
entries for propositional heads. The word is central to our view of
language.

causers, Ali an indirect one, and Musa a direct one.

The suppression of the AGENT function in 'to eat' which is essential to the meaning of 'to feed' should be captured in the rules for the derivation of direct causatives.

The difference between the two causatives is nicely illustrated by an example of a different sort. The following two sentences are <u>not</u> paraphrases of each other, (neere 'to sell', dey 'to buy', deyndi 'to cause to buy'):

(5)   Ali neere bari di Musa se
       Ali sell horse the Mousa to
       'Ali sold the horse to Mousa'

(6)   Ali   deyndi   bari di Musa se
       Ali cause-to-buy horse the Mousa to
       'Ali got Mousa to buy the horse'

In (5) Ali is AGENT and Musa is GOAL. In (6) both men are AGENT; moreover, in (6) a third person is understood, the one who sold the horse to Mousa. Ali in (6) cannot be understood as the salesman; the most likely explanation for this appears to be that Ali is the AGENT of indirect causation and that this function is incompatible with direct participation in the transaction.[5]

IC verb formation with -ndi is much more productive than DC verb formation with -ndi. Most DC verbs are unanalyzable morphemes. Note that 'buy' and 'sell' are unrelated to each other, despite the fact that their meanings are so closely related. The verb cowndi 'to teach' is derived from cow 'to learn', fahamndi 'to explain' from faham 'to understand', hayndi 'to empregnate' (actually 'to give a baby to') from hay 'to give birth to', and wafakundi 'to reconcile' from wafaku 'to agree with'; however, these verbs are the exception rather than the rule. A list of all the DC verbs in -ndi that we have found

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[5]We owe these insights concerning the DC verb neere 'to sell' and the IC verb deyndi 'to cause to buy' largely to Bob and Pat Terry.

is located in the Appendix. Note that when -ndi is added to a stem which is a one place predicate to form a causative the result is a two place predicate (derey 'to get lost', dereyndi 'to lose'); when the stem is a two place predicate, the result is a three place predicate, at least most of the time (mow 'to hear', mowndi 'to translate, inter- pret'), but when the stem is a three place predicate, the causative can only be a three place predicate. We have an example of this with the IC verbs formed from the stems meaning 'buy' and 'sell'. With neerendi 'to cause to sell' we can get two objects [___NP NP se] and consis- tently ambiguous readings, e.g. 'Ali caused someone to sell the horse to Mousa', or 'Ali caused Mousa to sell the horse to someone'. There are only a limited number of syntactic slots available to verbs and if there are too many semantic functions, one of them has to be left out.

3. Lexical entries for propositional heads

We view grammatical relations as correspondences between deep struc- ture configurations and semantic functions. These correspondences are defined in lexical entries for propositional heads. Consider the **sentence:**

(7)   Feneter di ba
       window   the break
       'The window broke'

This sentence describes a change of state for the object referred to in the subject NP. We will extend Gruber's notion [1965] and say that whatever undergoes a change of state is a THEME. The verb ba is the propositional head that provides us with the change of state meaning and with the information that the subject NP is to be interpreted as THEME. The deep-structure for (7) is:

(8)   S
                  NP   VP
                                  |
                                  V

The lexical entry for the propositional head of (8) is:

(9)   (a) (b)   (c)   (d)   (e)

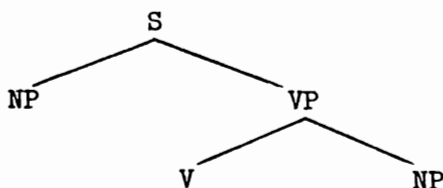   ba + V, [NP___] [THEME___], change of state . . .

Under (c) in (9) we have the syntactic subcategorization of the verb:
we include the subject NP because we want to represent all of the deep
structure configuration for which the verb established grammatical rela-
tions. Under (d) is the semantic propositional structure that corre-
sponds to the syntactic structure under (c). As a first approximation
of grammatical relations, it is useful to think of (d) as a template that
fits over deep structure (8) and gives the correct semantic interpreta-
tion. (e) represents the meaning of the verb.

Closely related to the intransitive sentence (7) is the following
transitive one:

(10)   Ali ba   feneter di
       Ali break window the
       'Ali broke the window'

This is a causative sentence where the immediate cause of the event
is an impact or direct application of force initiated by an AGENT (in
the usual interpretation). We will call the AGENT the direct or determi-
nant cause of the event in as much as he initiates the impact in some
way. In this case the THEME is the NP which is the object of the verb,
and the NP in subject position is the AGENT. Again, it is the lexical
entry for the verb that provides the propositional structure correspond-
ing to the syntactic configuration. The deep-structure configuration of
(10) is:

(11)
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                        S
                 _____/ _____
                /               \
              NP                 VP
                              __/  \__
                             /        \
                            V          NP
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The lexical entry for the prepositional head of (10) is:

(12)   (a) (b)   (c)   (d)   (e)

   ba + V, [NP___NP] [AGENT___THEME], change of state caused
                                              by an impact . . .

Under (d) we have what can be considered a template that fits over deep structure configuration (11) so that the two NPs are interpreted semantically as AGENT and THEME respectively.

There is no one-to-one correspondence between semantic functions and positions on a tree in a syntactically motivated deep structure. The correspondences vary from verb to verb. That this is the case for English has been made abundantly clear by Chomsky [1965:160-63], Fillmore [1966, 1968], and others. The situation is no different for Sonrai. Consider again ba 'to break' along with two other verbs, hina 'to cook' and ŋa 'to eat'. All three can be used both transitively and intransitively. Transitively (NP_1 V NP_2):

(13) Ali ba goroŋgo tondi di
      Ali break chicken stone the
      'Ali broke the egg'

(14) Ali hina goroŋgo tondi di
      Ali cook chicken stone the
      'Ali cooked the egg'

(15) Ali ŋa goroŋgo tondi di
      Ali eat chicken stone the
      'Ali ate the egg'

On a significant level of abstraction, we can say that these three verbs have same grammatical relations in sentences such as these: [NP___NP] [AGENT___THEME], as in parts (c) and (d) of (12). Their intransitive uses are different, however:

NP_1 V	NP_2 V
(16) ?*Ali ba	(17) Goroŋgo tondi di ba
Ali break	chicken stone the break
'Ali broke'	'The egg broke'
(18) Ali hina	(19) Goroŋgo tondi di hina
Ali cook	chicken stone the cook
'Ali cooked'	'The egg cooked'

NP_1 V	NP_2 V

(20)   Ali ŋa   (21) ?*Goroŋgo tondi di ŋa

       Ali eat   chicken stone the eat

       'Ali ate'   'The egg ate'

Sentences (16) and (21) are acceptable only when Ali is thought of
as designating something brittle enough to break, in which case Ali
could also occur in object position in a transitive sentence, or when,
as in a folk tale perhaps, an egg is thought of as being capable of in-
gesting food in a manner similar to a fully-formed animal, in which case
egg could occur in subject position in a transitive sentence. Syn-
tactically these verbs are the same. They can all be inserted in deep
structure configurations (8) or (11), but the sets of semantic templates
assigned to these configurations, in particular to the intransitive con-
figuration (8), are different:

(22) (a)   (b) (c)   (d)   (e)

     ba   + V [NP___]   [THEME____]
              [NP___NP]   [AGENT___THEME] impact...   change of state...

     hina + V [NP___]   {[THEME___]}
                          {[AGENT___]}
              [NP___NP]   [AGENT___THEME]   change of state...

     ŋa   + V [NP___]   [AGENT___]
              [NP___NP]   [AGENT___THEME]   change of state...

Any grammar accounting for grammatical relations would have to indi-
cate the difference between the above three verbs in the lexicon anyway,
whatever other apparatus was proposed; our position is that the lexicon
is the only part of the grammar where this distinction is appropriate.

4. __Derivational morphology accounted for in the lexicon by word__
   __structure conditions__

We will not content ourselves with simply listing lexical entries as
in (22). There are many Sonrai verbs which like ba 'to break' and
hina 'to cook', and unlike ŋa 'to eat', can occur intransitively
[NP___] with the semantic function [THEME___] as well as transitively

[NP___NP] with the semantic functions [AGENT___THEME]. We call these object middle verbs in that they allow the same NP in subject position in intransitives as in object position in transitives. Some object middle verbs are:

(23)   kukur 'to burn', ɲumey 'to wash', dumbu 'to sever',
        kayrey 'to shatter', morro 'to pulverize', ba 'to break',
        hina 'to cook', neere 'to sell', daabu 'to close',
        kufal 'to lock', fer 'to open', ŋami 'to mix', dibi 'to
        mix together', mun 'to spill', ton 'to fill', ko 'to dry',
        ben 'to finish', menne 'to melt'

The above verbs all share the following grammatical relations:

(24)   ...   (c)   (d)   ...
    (i)   [NP___]   [THEME___]
    (ii)   [NP___NP] [AGENT___THEME]

The relationship between (i) and (ii) in (24) can be represented as Direct Causative Condition I:

(25)   [NP___] [THEME___] ⊃ [NP___NP] [AGENT___THEME]

That is, if a propositional head can govern the grammatical relations on the left then it can also govern the grammatical relations on the right. It is a word structure (WS) condition for the part of lexical entries concerned with grammatical relations (cf. Stanley [1967] on morpheme structure conditions). A fuller treatment would have Direct Causative Condition II, concerned with causative sentences with instrumental subjects, etc. Condition (25) says nothing about morphological form: bun 'to die' and wi 'to kill', which are morphologically unrelated but semantically have the same propositional head. (25) could presumably apply to them equally well. There are few verbs, if any, which do not conform to (25), i.e. verbs which occur intransitively for which there is no transitive causative counterpart that shares their meaning. In the cases we have studied, causative verbs contain idiosyncratic accretions to the meaning of their intransitive non-causative counterparts, but not vice-versa.

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Including (25) in the grammar amounts to a claim about native speaker competence, and the way language is learned: When a child learns to produce intransitive sentences with the verbs in (23), or pairs of verbs like 'die' and 'kill', he relies on the general knowledge of grammatical relations represented by the WS condition (25), rather than learning each verb as a totally separate unit.[6]

There are cases where verbs to which WS condition (25) applies must, in transitive usage, have the causative suffix -ndi. We will examine variations on the verbs of motion kam 'to fall', goro 'to sit', jur 'to run' and fatta 'to go out':

(26)   Tu di kam NP_1 V
       pot the fall
       'The pot fell'

(27)   Garba kamndi ⱡu di NP_2 V NP_1
       Garba drop   pot the
       'Garba dropped the pot'

(28)   Usman goro NP_1 V
       Ousman sit down
       'Ousman sat down'

(29)   Garba gorondi Usman NP_2 V NP_1
       Garba sit down Ousman
       'Garba sat Ousman down'

(30)   Bari di jur NP_1 V
       horse the run
       'The horse ran'

---

[6]There are important generalizations that could be made for universal grammar concerning grammatical relations. We have never heard of an SVO language which has transitive sentences [NP V NP] with the left-to-right order of semantic functions as [THEME verb AGENT] unless it is some kind of special sentence construction like the passive. The most common word order for intransitive sentences in SVO languages is [NP V]. Thus, the pattern of grammatical relations discussed here is very common: [THEME verb] for intransitive use of a given verb, and [AGENT verb THEME] for its transitive counterpart.

(31) Garba jurndi bari di   NP$_2$ V NP$_1$
      Garba ride   horse the
      'Garba rode the horse'

(32) Musi di fatta   NP$_1$ V
      cat the go out
      'The cat went out'

(33) Garba fattandi musi di   NP$_2$ V NP$_1$
      Garba take out cat   the
      'Garba took the cat out'

The morphological form of the verbs in the transitive sentences above can be described as the result of a lexical rule, the Verb Morphological Form Rule I:[7]

(34) V +ndi = V

A unified lexical entry for kam and kamndi can be represented as follows:

(35) (a)   (b)   (c)   (d)   (e)
      kam   [NP___]   [THEME___],   physical motion...
                   +V
      [___] +ndi   [NP___NP] [AGENT___THEME], physical motion caused
      V   V   by release from a grip,
                                                         etc. ...

Given that there are a number of lexical items in Sonrai with the category label +V which also have the internal structure V +ndi , the entries under part (a) of (35) can be considered less costly to the grammar. We are claiming that a child learning verbs such as kam, kamndi , and the others in (27)-(33), recognizes the internal structure of the morphemically complex verb and simplifies the learning by reference to the general principle of morphological form (34); furthermore, the form-meaning relationship in pairs of verbs such as kam/kamndi can be

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[7]We got the formulation of this kind of rule, also the idea of separating the rules for morphological form from the generalizations concerning meaning in the content of lexical entries, from Ray Jackendoff in a lecture at Indiana University in December of 1969.

captured as a statement of entailment between the rule of morphological form (34) (an MF rule) and rule (25) of Direct Causative Condition I (a GR condition):

(36)   MF rule (34) ⊃ GR condition (25)

The importance of this condition to the grammar corresponds to the number of items in the lexicon to which it applies. Although it characterizes a substantial subclass of verbs, it does not apply exhaustively to the language, i.e. not all verbs of the form V +ndi are direct causatives. We will call such a statement a <u>minor condition</u>: It characterizes a subpart of the language but not the language as a whole. For this subpart we are saying in effect that the morphological form V +ndi entails direct causative meaning.

It is our purpose to concentrate on the portion of meaning of sentences which is least idiosyncratic, the system of semantic functions that can be used to characterize the grammatical relations governed by all propositional heads. Even at that we have not been comprehensive. A more detailed account would take into consideration a number of facts we have passed over here. Note that for kamndi and gorondi, 'to drop' and 'to sit down (trans.)', the meaning involves physical contact between the subject and the object, and motion for the object; while for jurndi 'to ride' and fattandi 'to take out', the meaning involves not only these elements of meaning, but motion for the subject as well. In a fuller account of grammatical relations it could be argued that the subjects as well as the objects of the latter two verbs are THEME in propositions of motion, so that the subjects would be simultaneously AGENT and THEME.

There are subtleties which we have skipped about AGENT in kamndi 'to drop'. We have also passed over the fact that whereas the subject of kam   'to fall' is THEME, that of jur 'to run' and fatta 'to go out' may be AGENT as well as THEME, and that of goro 'to sit down (intrans.)' must be AGENT as well as THEME. These facts should not detract from the point that we intend to make here, which is that there are aspects of sentential meaning, closely related to aspects of form, which can be shown to be quite general and can be accounted for in the lexicon.

It happens that each of the causative sentences, (27), (29), (31) and (33) are ambiguous. Given above are only the direct causative meanings. Each of them also has an indirect causative meaning:

(27') Garba kamndi   tu di
       Garba cause-to-fall pot the
       'Garba caused the pot to fall'

(29') Garba gorondi   Usman
       Garba cause-to-sit Ousman
       'Garba had Ousman sit down'

(31') Garba jurndi   bari di
       Garba cause-to-run horse the
       'Garba made the horse run'

(33') Garba fattandi   musi di
       Garba cause-to-go-out cat the
       'Garba made the cat go out'

To account for these meanings, we need another Grammatical Relations condition and another condition showing an implicational relationship between form and meaning.

We are making the following important distinction between DC and IC constructions (e.g. (27) versus (27')): Although they both are assigned a simplex tree (11) as their deep structure syntactic analysis, only DC constructions will be treated <u>semantically</u> as simplex propositions; IC will be treated as complex propositions. A simplex S is everything dominated by an S node without an intervening S. A simplex proposition is all the meaning governed by a propositional head without another one intervening. The lexical entries for the V +ndi verbs in sentences like (27') will contain the following grammatical relations:

(37)   [NP___NP][AGENT <u>IC</u> [THEME___]]
         α   β   α   β

The semantic representation [AGENT <u>IC</u> [THEME___]] is to read:

(37') 'AGENT cause indirectly [THEME to (<u>STEM verb</u>)]'

(e.g. 27'), 'Garba caused the pot to fall' with kam+ndi from kam 'to fall'). The Greek letter indexes are to show the correspondences between NPs and semantic functions unequivocally. The head of the matrix proposition, in the outside set of brackets is a proverb IC meaning pretty much what the lexical item cause does in English, i.e. indirect cause, cf. the discussion in Hall [1965]; the head of the subordinate proposition is the stem of the V +ndi verb.

As we will show in Section 5, not all of the co-occurrences of the stem verb in its independent occurrences are allowed in IC constructions; but in those that are allowed, the full meaning of the stem verb is preserved. The most compelling reason for the complex proposition analysis of IC constructions is that the subject of the IC verb V +ndi is always interpreted as an indirect cause, while a direct cause may be associated with the part of the meaning governed by the stem verb, as in the cases discussed in Section 2, where there can be two AGENTs.

If complex structure is the appropriate semantic analysis for IC sentences, then one can ask why we do not assign a complex sentence deep structure to IC sentences for our syntactic analysis. In Section 6 we give arguments to show that the deep structure must be a simplex S.

We now see a case where we have different symmetries in our syntactic and semantic representations. This raises an important question in principle. Actually, left-to-right order in semantic representation has no value in our scheme except as an arbitrary convention for the purpose of exposition; hierarchy does have value, though, so the question of principle remains. Our position is that describing grammatical relations as correspondences between two systems of structure, one syntactic and one semantic and each with its own regularities, will allow simpler and more revealing descriptions of syntax and semantics respectively, which are, we think, properly defined as independent aspects of linguistic competence. By opting for such an approach, we also make a claim about a third aspect of competence, namely we attribute importance to the correspondences themselves, e.g. the Greek letter subscripts in (37), or, in more usual parlance, to the projections from syntactic onto semantic representations. Surely these correspondences are themselves systematic:

we believe that they are and that interesting regularities in correspon-
dences can be revealed in WS conditions on grammatical relations such as
we are outlining here. The working out of detailed problems in the analy-
sis of IC verbs here, and more particularly in Section 6, is offered in
the way of empirical evidence for the validity of our position.

Two more conditions are necessary, the first, Indirect Causative
Condition I:

(38) [NP___][THEME___] ⊃ [NP___NP][AGENT IC [THEME___]]
       α   α   α   β   α   β

This condition accounts for pairs of sentences like (26) 'The pot
fell' and (27') 'Garba caused the pot to fall'. In a comprehensive ac-
count, many other constructions would be accounted for by conditions of
this kind. The formation of IC verbs V +ndi from already existent verb
stems is pervasive but not fully productive (this matter will be discus-
sed further in Section 6). Thus, (38) will have to be called a _minor_
condition. However, it has greater importance for the grammar than other
conceivable conditions of this kind, because there are so many lexical
items to which it applies. Another condition is:

(39) GR Condition (38) ⊃ MF Rule (34)

Condition (39) can be called a _major condition,_ since it applies ex-
haustively in Sonrai: The only Sonrai verbs governing IC propositions
like those above have the form V +ndi.

We are now prepared to display a unified lexical entry for the three
related verbs kam 'to fall', kamndi 'to drop' (DC) and kamndi 'to
cause to drop' (IC):

(40)   (a)   (b)   (c)   (d)
        kam   [NP___] [THEME___]
        [___] +ndi   +V   [NP___NP][AGENT___THEME] caused by   physical
        V   V   release from grip motion
        [___] +ndi   [NP___NP][AGENT IC [THEME___]]
        V   V

It should be reiterated that we are making generalizations about lexical items, and that in actual sentences it is the propositional head that is the repository of the native speaker's knowledge of grammatical relations: they are part of the meaning of this kind of word. An analysis of words is essential to the understanding of the deepest regularities of language. The WS conditions that we have formulated for grammatical relations and for form-meaning relationships in morphology are claims about linguistic competence, the way languages are learned and the way they change. We are saying that the primary elements involved are these generalizations and not lexical items as unrelated parts of a list. The ultimate arbitration of theoretical dispute over competing theories of grammatical relations should involve evidence from language learning and language change.

5. <u>Lexicalist versus transformationalist hypotheses for derivational</u> <u>morphology</u>

The distinction between lexical and transformational derivations of morphological items arises only in a theory that posits an abstract level of representation where lexical insertion takes place before the application of syntactic transformations. It is hard to imagine how in a theory in which all lexical insertion takes place after the cyclically ordered rules of syntax such a distinction would be possible or even desirable. We adhere to the notion of a syntactically-motivated deep structure where lexical insertion takes place, and we do so for two main reasons: first, we want such a level on which to make an abstract characterization about word order; and second, we want a level on which to define grammatical relations in the lexical entries for propositional heads. The two functions of deep structure coincide: the optimal point at which to specify grammatical relations for propositional heads is on the level at which syntactic co-occurrence restrictions are defined for them.

In our view there are two kinds of systematic sound-meaning correspondences: propositional meaning defined by lexical heads at the same level at which syntactic co-occurrence restrictions are specified, i.e. in deep structure before the application of syntactic transformations; and scope meaning, which depends on order after the application of syntactic

we believe that they are and that interesting regularities in correspon-
dences can be revealed in WS conditions on grammatical relations such as
we are outlining here. The working out of detailed problems in the analy-
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count, many other constructions would be accounted for by conditions of
this kind. The formation of IC verbs V +ndi from already existent verb
stems is pervasive but not fully productive (this matter will be discus-
sed further in Section 6). Thus, (38) will have to be called a <u>minor</u>
<u>condition</u>. However, it has greater importance for the grammar than other
conceivable conditions of this kind, because there are so many lexical
items to which it applies. Another condition is:

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haustively in Sonrai: The only Sonrai verbs governing IC propositions
like those above have the form V +ndi.

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related verbs kam 'to fall', kamndi 'to drop' (DC) and kamndi 'to
cause to drop' (IC):

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        kam   [NP___] [THEME___]
        [___] +ndi   +V   [NP___NP][AGENT___THEME] caused by   physical
        V   V   release from grip   motion
        [___] +ndi   [NP___NP][AGENT IC [THEME___]]
        V   V

'to break', etc. It is frequently the case semantic functions are changed in the derivation of these verbs, and sometimes in different ways for different items. For example, as we have said in the DC verb derived from kam 'to fall', kamndi 'to drop', the causative subject is stationary, while the DC verb derived from jumbu 'to go down' is jumbundi 'to bring down' where the causative subject either moves with the object of the causative verb or is stationary at the terminal point of motion. In the latter case there is a level of meaning in which the causative subject would have to be represented as THEME or GOAL as well as AGENT, in the former the causative subject would be AGENT and SOURCE. No DC verb can have more than one AGENT: in DC verbs of the form STEM+NDI where the stem used without the affix is an agential verb, e.g. ŋa 'to eat', goro 'to sit down', the semantic function AGENT is always suppressed for the stem, cf. Section 2. The effect DC verb formation has on grammatical relations can be seen to be even more extensive when a wider set of facts is considered. For example, agential verbs such as ŋa 'to eat' can take an INSTRUMENT used by the AGENT, e.g. a fork, but in the derived DC verb, the only INSTRUMENT allowable is the one used by the causative AGENT--X's feeding Y with a fork entails Y's eating, but not Y's eating with a fork. All this evidence concerning grammatical relations argues in our view for a lexical derivation of DC verbs. For supporting argument, we can point to the idiosyncratic nuances in the meaning of the DC verbs not predictable from either the meaning of the stems or the general meaning of direct causation, e.g. (35e), etc.

6. Why indirect causatives must be derived lexically

Among causative verbs of the form STEM+NDI, the most likely candidates for a transformational derivation are the IC verbs. The only IC verbs occurring as part of what appear to be simplex sentence constructions in surface structure are those of the form STEM+NDI. The only other way indirect causation can be expressed in Sonrai is in complex sentence constructions, e.g. with the verb gabi 'to force'. Usually, in the languages of the world, indirect causation is expressed only in complex sentences. One could hypothesize then that sentences such as (41) below are simplexes in surface structure only and that in their deep

transformations, either cycle by cycle, or after all syntactic transfor-
mations have applied, cf. Chomsky [1969] on the notions of focus and pre-
supposition, Jackendoff [1969] on coreference, scope of negatives,
quantifiers and adverbs.

If such a point of view is correct, then it is easy to see one of the
things that syntactic transformations should <u>not</u> be allowed to do: they
should not be allowed to change the value of lexical items as proposi-
tional heads.[8] If the morphological item in question is a propositional
head, and it is proposed that the morphological item be created by a
syntactic transformation, then it would have to be the case that all the
propositional properties of the derived item can be accounted for in the
lexical entries present in the deep structures of the sentences in which
it occurs. Conversely, if the derived item governs a new set of gram-
matical relations, then it has to itself be a lexical item inserted in
deep structure.

An obvious example of a class of morphological items which cannot be
derived transformationally in this view are the direct causatives, ŋandi
'to feed', cowndi 'to teach', neere 'to sell', the transitive ba

---

[8]In Chomsky [1968], the paper that inspired the title of this section,
Chomsky gives a great deal of evidence to show that the meaning and co-
occurrence restrictions for English deverbal nouns, e.g. criticism, are
idiosyncratically related to the verbs from which they are derived so
that the nouns should be lexical entries in their own right. He makes
it clear that he expects cooccurrence restrictions between heads and
their complements to be lexically defined, but does not go so far as to
say that grammatical relations are also relevant to the problem. He
treats grammatical relations as an open question in the theory, cf.
Chomsky [1965:160-63; 1968:fn15]; however, he does much to suggest that
grammatical relations are relevant to the problem. For example, he
points out the following data:
    (a) John amused the children with his stories.
    (b) *John's amusement of the children with his stories . . .
    (c) John's amusement at the children's antics . . .

We would say that the verb amuse in its lexical entry allows for
the imposition of the semantic function AGENT, while the noun amusement
does not. This in itself would be a reason for having a lexical rather
than a transformational derivation of amusement.

structure (42) into the appropriate surface structure, a transformation
involving seven elementary operations.[9] More serious is the fact that
this hypothesis makes the wrong predictions about what is grammatical.
First, although hina can take an INSTRUMENT subject when used in a
simplex sentence, the object of se after hinandi cannot be interpreted
as INSTRUMENT:

(44)   Boosi kono hina goroŋgo tondi yo
        embers hot cook chicken stone pl.
       'Hot embers cooked eggs'

---

[9]If the deep structure were (42), the embedding transformation would
have to totally rebuild the tree:

   (i)   TRANSFORMATION FOR THE COMPLEX SENTENCE HYPOTHESIS:

          S.I. X – [$_{VP}$ – NDI – [$_S$ – NP – V – NP – X

                1   2   3   4   5   6   7   8

          S.C. 1, 2, 6+3, $\emptyset$, 2>7, $\emptyset$, 2>PP>5 + POST>se, 8

          (a)   Attach a copy of 6 as left sister of 3.
          (b)   Attach a copy of 7 as left sister of 4
          (c)   Attach PP as right sister of 4
          (d)   Attach a copy of 5 as left daughter of the PP in (c)
          (e)   Attach POST as the right daughter of the PP in (c)
          (f)   Attach se as daughter of the POST in (e)
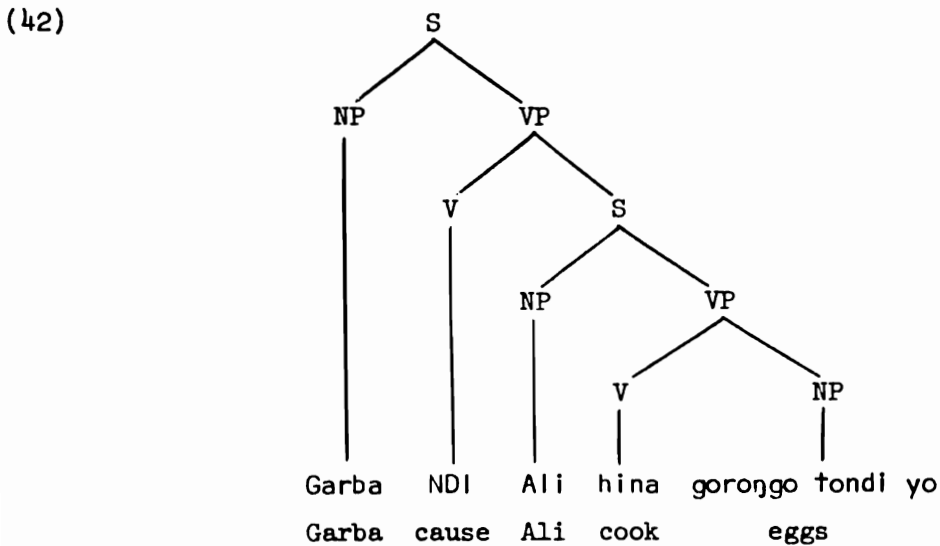   (g)   Erase 4 and everything under it

     Several of these operations become unnecessary under the Revised
Complex Sentence Hypothesis (47), but another transformation must be
added for Equi-NP deletion. Any hope of limiting the power of transfor-
mations when rules of this kind are allowed is completely lost. The
forms that these transformations can create can occur freely in sub-
ordinate as well as main clauses. The promising work by Emonds [1969]
on a structure-preserving theory of transformational grammar makes the
claim for English that transformations can do least to rearrange the
structure of deep structure trees in embedded position. Our preliminary
investigation of Sonrai syntax leads us to believe that this principle
is appropriate for Sonrai too. For example, there is a preposing
emphasis construction that moves phrase nodes from the right of the verb
and places them in front of the sentence. This rule operates freely
only in main clauses.

structure they are complex sentences with a matrix verb NDI 'to cause'.
We will call this the Complex Sentence Hypothesis for IC verbs of the
form STEM+NDI (see hinandi 'to cause to cook' from hina 'to cook'):

(41) Garba hinandi   gorongo tondi yo Ali se
      Garba cause-to-cook chicken stone pl. Ali to
      'Garba had Ali cook eggs'

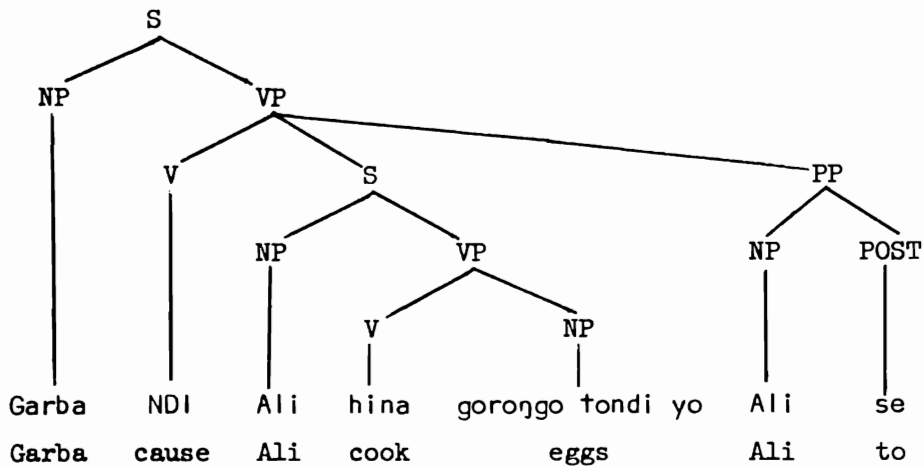The Complex Sentence Hypothesis would assign to (41) the deep structure:

(42)

```
                          S
                  ┌───────┴───────┐
                 NP              VP
                  │          ┌────┴────┐
                  │          V         S
                  │          │    ┌────┴────┐
                  │          │   NP        VP
                  │          │    │    ┌────┴────┐
                  │          │    │    V        NP
                  │          │    │    │         │
                Garba       NDI  Ali  hina  gorongo tondi yo
                Garba      cause  Ali  cook         eggs
```

The deep structure (42) would be converted into a simplex sentence
by an obligatory transformation. In the meanwhile semantic interpreta-
tion for the propositional content of the sentence could be carried out
in deep structure, with grammatical relations defined in the lexical
entries for the two verbs NDI 'to cause' and hina 'to cook', that is
THEME is extended to apply to entities that are caused, where cause is
a kind of change of state, and we obtain:

(43) (a) (b)   (c)   (d)   (e)
      NDI +V [NP___S] [AGENT___THEME]   indirect causation...
      hina +V [NP___NP] [AGENT___THEME]... change of state...

The first problem with the Complex Sentence Hypothesis is the sheer
complexity of the transformation that would be required to convert deep

If the Complex Sentence Hypothesis were right, there would be nothing syntactically ill-formed about (46), for clause-by-clause it is a grammatical sentence. Instead of positing the unlikely constraint of a selection between the main clause verb and the subject of the embedded sentence, the only way to account for the ungrammaticality of (45) is to revise the Complex Sentence Hypothesis as follows, e.g. for sentence (41):

(47)


```
                              S
                    ┌─────────┴─────────┐
                   NP                   VP
                    │          ┌────────┼──────────────────┐
                    │          V        S                  PP
                    │          │    ┌───┴────┐           ┌──┴───┐
                    │          │    NP       VP          NP    POST
                    │          │    │      ┌─┴──┐         │      │
                    │          │    │      V    NP        │      │
                    │          │    │      │    │         │      │
                  Garba       NDI  Ali   hina gorongo tondi yo  Ali    se
                  Garba      cause  Ali  cook      eggs         Ali    to
```

Now instead of having the subject of the embedded sentence raised into the main clause by the embedding transformation, we could say that there is a rule of equi-NP deletion that deletes the subject of the embedded sentence on identity with the object of se in the main clause. All the objects of se must be interpreted as animate. If instead of Ali, we had boosi kono 'hot embers' as the embedded subject, this same NP would have to be the object of the postposition se and the main clause. The structural description for equi-NP deletion and embedding could be met, but boosi kono 'hot embers' in the main clause would be incompatible with the presuppositions of se (under normal circumstances). Thus, the ungrammaticality of (45) would be accounted for. But it turns out that troubles are just beginning for the Complex Sentence Hypothesis. Sentence (41) had the form [Garba V NP [Ali se]]; it is also possible to get [Garba V [Ali se] NP] and [Garba V Ali NP] as paraphrases. This suggests that there might be a Sonrai rule of "Dative Shift" with a sentence

(45) *Garba hinandi   goroŋgo tondi yo boosi kono se

      Garba cause-to-cook chicken stone pl. embers hot to

      'Garba caused the hot embers to cook the eggs'

Sentence (45) is grammatical only in the fanciful situation where the embers are personified and thought of as AGENT.
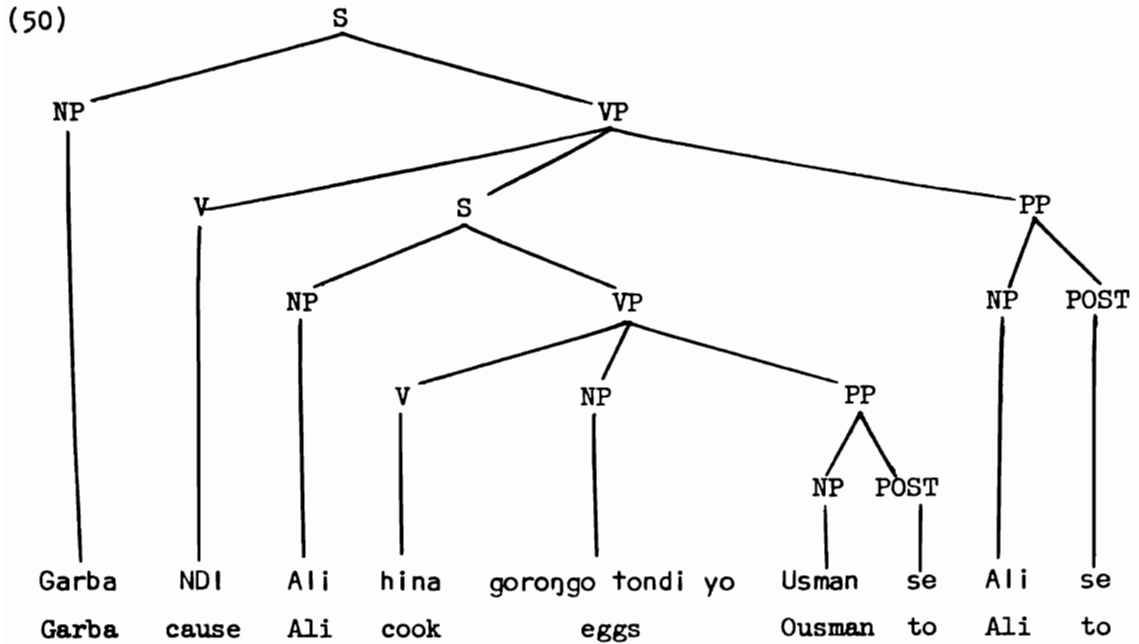
    The problem is how to block the embedding transformation posited for the Complex Sentence Hypothesis from operating on what would have to be the deep structure for (45):

(46)
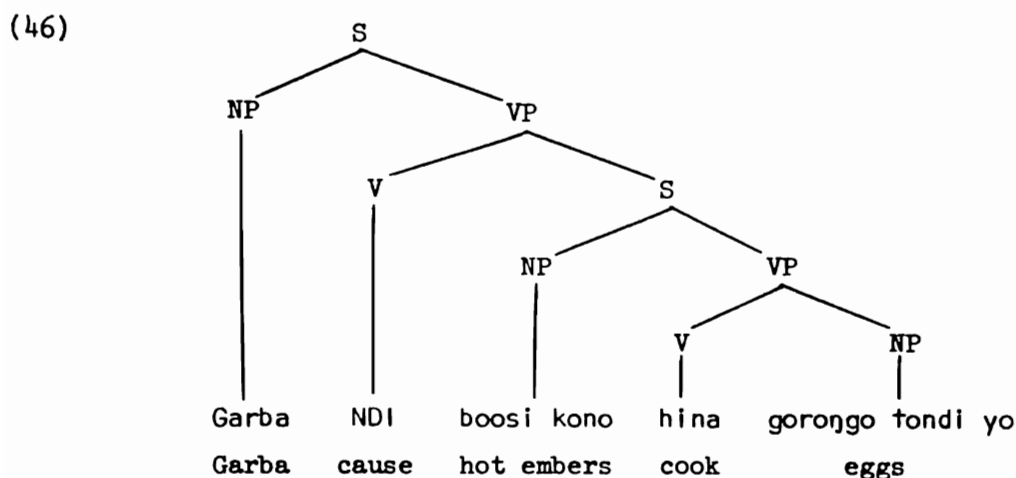
    The formulation of transformation (i) becomes much more complicated when a fuller range of examples is examined. The [NP se] phrase can occur only when the causative verb has a double object; this is a general constraint on double object verbs. Some of the same causative verbs that take double objects will also take single objects.

    (ii) Garba hinandi   mo di   Ali se

          Garba cause-to-cook the rice   Ali

   (iii) Garba hinandi mo di (*se)

         'Garba is having someone cook the rice.'

    (iv) Garba hinandi Ali (*se)

         'Garba is having Ali cook.'

    Generating sentences (iii) and (iv) correcting is a very complicated problem for either the Complex Sentence Hypothesis (42) or the Revised Complex Sentence Hypothesis (47). An algorithm can be found but it doesn't look like a rule of language.

(50)

```
                              S
              ┌───────────────┴───────────────┐
             NP                               VP
              │        ┌────────────┬──────────────────────┐
              │        V            S                      PP
              │        │     ┌──────┴──────┐              ┌──┴──┐
              │        │    NP            VP             NP    POST
              │        │     │      ┌──────┼──────┐        │     │
              │        │     V     NP            PP        │     │
              │        │     │      │          ┌──┴──┐     │     │
              │        │     │      │         NP   POST    │     │
              │        │     │      │          │     │     │     │
            Garba     NDI   Ali    hina  gorongo tondi yo Usman  se   Ali   se

            Garba    cause  Ali   cook       eggs       Ousman  to   Ali   to
```

The embedding rule would raise the embedded PP into the main clause
and then the hypothetical dative shift rule would have to obligatorily
move the main clause PP next to the verb and delete the se to ensure
output of the grammatical (48') instead of the ungrammatical (41').
Making an otherwise optional rule obligatory just in case a certain kind
of embedding transformation has operated is a highly dubious solution,
and one which in fact throws the Complex Sentence Hypothesis into doubt.

The logically conceivable range of sentences under the Complex Sen-
tence Hypothesis would include one with two benefactives, one for the
main clause and one for the embedded sentence. Sentence (41) is actually
ambiguous.

(41)   Garba hinandi   gorongo tondi di yo Ali se
       Garba cause-to-cook chicken stone the pl. Ali to
   a. 'Garba had Ali cook the eggs'
   b. 'Garba had someone cook the eggs for Ali'

We leave aside the question of what the deep structure would be for
the second interpretation of (41) (further reason to doubt the Complex
Sentence Hypothesis). Imagine the sentence for the following situation:
'Ali cooks the eggs for Ousman and Garba causes this to happen for Kalil'.

such as (41) as input, and then shift of the postpositional phrase with optional deletion of the se. This rule would apply to most if not all sentences with double object verbs occurring in the environment (a) $[NP_1\_\_\_NP_2 \ [NP_3 \ se]]$ giving (b) $[NP_1\_\_\_ \ [NP_3 \ se] \ NP_2]$ or (c) $[NP_1\_\_\_NP_3 \ NP_2]$ as output. The (c) variant for (41) would be as follows:

(48)   Garba hinandi   Ali gorongo tondi yo
        Garba cause-to-cook Ali chicken stone pl.
        'Garba had Ali cook eggs'

   Now the dilemma: sentence (48), but not (41) can be extended by another [NP se] phrase, which must have a benefactive meaning.

(48')   Garba hinandi   Ali gorongo tondi yo Usman se
        Garba cause-to-cook Ali chicken stone pl. Ousman to
        'Garba had Ali cook eggs for Ousman'

(41') *Garba hinandi   gorongo tondi yo Ali se Usman se
        Garba cause-to-cook chicken stone pl. Ali to Ousman to
        'Garba had Ali cook the eggs for Ousman'

   For one of the possible interpretations of (48'), the Complex Sentence Hypothesis would have to posit (49) as an embedded sentence in the deep structure (50); the latter giving the deep structure of (48'):

(49)   Ali hina gorongo tondi di yo Usman se
        Ali cook chicken stone the pl. Ousman to
        'Ali cooked the eggs for Ousman'

if the environment is [V NP___] and the verb is a single object verb,
they can have only a benefactive meaning; whereas if the verb is double
object, as is hinandi, then their meaning is usually ambiguous between
benefactive and something else. Our analysis takes note of the fact that
benefactives are an optional semantic function with a wide range of sen-
tences, that se always has a meaning best glossed by 'to' and that its
object is always a [+animate] goal for some kind of abstract motion.
What the GOAL may receive may be simply an object, or the meaning associ-
ated with benefactives, or in the case of IC verbs like hinandi the
predication of the semantic function associated with the deep structure
subject of the stem of the IC verb, i.e. for hina 'to cook' as in
hinandi, AGENT; for mow 'to hear' as in mowndi, GOAL. The evidence
that we have summarized here briefly leads us to believe that there is
no Dative Shift Rule and that VPs of the form [V NP NP ...] can be
generated in deep structure, where the PS rule for VP is as follows:

(53') VP → V (NP) (NP) (PP)* (S)

Some general co-occurrence restriction (a semantic one?) would prevent
more than one se per VP in a simplex sentence in deep structure.

      If one did away with the Dative Shift Rule within the framework of
the Complex Sentence Hypothesis, then new measures would have to be
taken to bar the generation of the ungrammatical *(54) (cf. (44) and
*(45)):

(54) *Garba hinandi   boosi kono gorongo tondi di yo
        Garba cause-to-cook embers hot chicken stone the pl.
      'Garba caused the hot embers to cook the eggs'

      The ungrammaticality of (45) and (54) are representative. All IC
verbs on the form STEM+NDI are constrained in the same way: if the
event that is caused indirectly itself has a direct cause, that direct
cause must be AGENT and not INSTRUMENT. The co-occurrence restrictions
for the complements of STEM+NDI IC verbs altogether the cases involv-
ing both INSTRUMENT and BENEFACTIVE appear unmanageable with the frame-
work of a Complex Sentence Hypothesis. Such a hypothesis means positing

The deep structure for this sentence would be as follows:

(51)

Tree diagram (51): S → NP [Garba / Garba] + VP. VP → V [NDI / cause] + S + PP. Inner S → NP [Ali / Ali] + VP. Inner VP → V [hina / cook] + NP [gorongo tondi yo / eggs] + PP [NP Usman / Ousman + POST se / to]. Outer PP → NP [Kalil / Kalil] + POST [se / to].
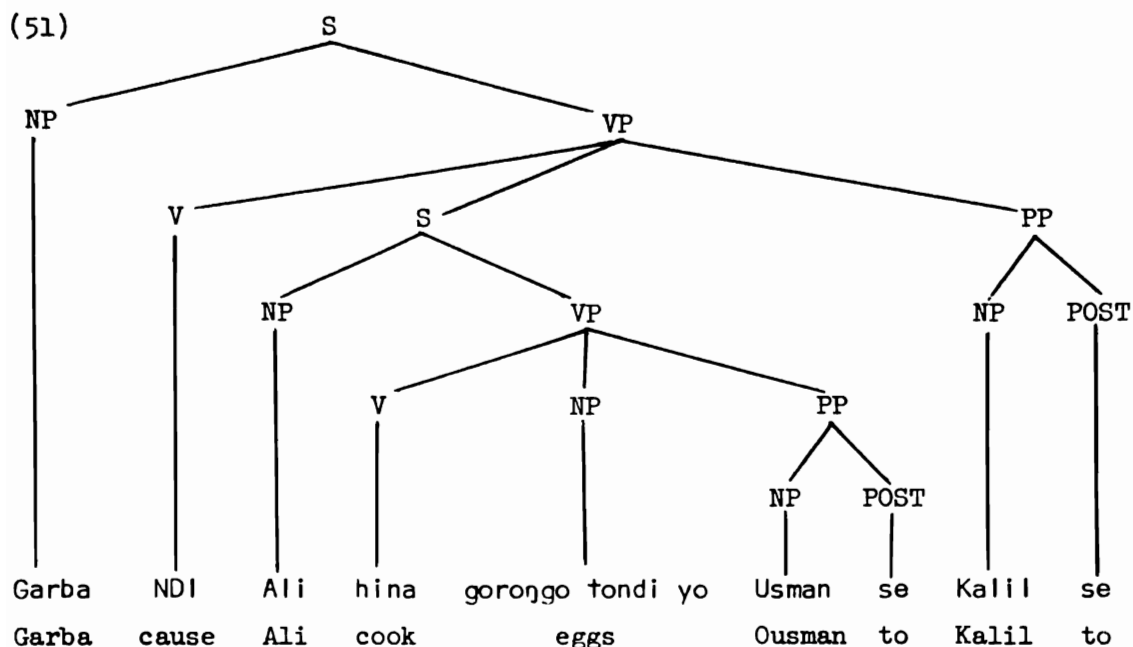
There is no grammatical output for such a deep structure, e.g. (52), (53), etc. are ungrammatical:

(52) *Garba hinandi   gorongo tondi yo Ali se Usman se Kalil se
       Garba cause-to-cook chicken stone pl. Ali to Ousman to Kalil to
       'Garba had Ali cook eggs for Ousman for Kalil'

(53) *Garba hinandi   Ali gorongo tondi yo Usman se Kalil se
       Garba cause-to-cook Ali chicken stone pl. Ousman to Kalil to
       'Garba had Ali cook eggs for Ousman for Kalil'

A blocking transformation designed just to block deep structures such as (51) would be needed, or else a principle of semantic interpretation. The problem with the latter is that more than one se can occur in complex sentences in Sonrai. It is only in simplex sentences that only one se and only one benefactive is allowed. We would be left with the principle that surface structure simplexes can have only one se and only one benefactive and need a principled way of incorporating that in our grammar in order to block sentences like (52) and (53).

The general situation for [NP se] phrases is that they can occur in the environment [V NP___] or [V NP NP___] and in those environments only;

cause to eat', ɲumeyndi 'to cause to wash' and dumbundi 'to cause to sever'. Others cannot, e.g. hinandi 'to cause to cook', neerendi 'to cause to sell', kufalndi 'to cause to lock up'. Such idiosyncracy can be accounted for only in lexical entries for the IC verbs themselves.

The final argument against the Complex Sentence Hypothesis concerns verbs of the form [STEM+NDI]+NDI, where the inside -NDI is usually a DC suffix, sometimes an IC suffix, but never a passive suffix; the outside -NDI can be a passive suffix or an IC suffix, never a DC suffix:

(55)   [STEM+NDI]+NDI: [DC or IC] + PASSIVE
        Tasu di ŋandindi Musa se (Ambiguous)
        rice the ...   Mousa to
        Passive of DC: 'The rice was fed to Mousa (by someone)'
        Passive of IC: 'The rice was caused to be the object of
                         Mousa's eating (by someone)'

(56)   [STEM+NDI]+NDI: [DC, perhaps IC]+IC
        Garba ŋandindi tasu di Musa se (Ambiguous)
        Garba ...   rice the Mousa to
        IC of DC: 'Garba had someone feed the rice to Mousa'
        IC of IC: ?'Garba had someone have Ali eat the rice'

Sentences like these can and do occur, although Sonrai speakers do their best to avoid them.[10] They seem awkward, not because of their meaning, but because of their form, about as awkward as two -ing

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[10]A nice example of a natural use of double -ndi was supplied to us by Susan Higgins:

(i) A go sendu boro   ma   berndindi   ka
     it's hard person   SUBJUNCTIVE be honored   CONJ

         kaynandindi   han fo
         be reprimanded   day one

     'It is hard to be congratulated and reprimanded both on the
        same day.'

Berndindi is the passive of berndi 'to honor', which is the DC of beri 'to be big'; kaynandindi is the passive of 'to reprimand, to insult' kaynandi, which comes from kayna 'to be small'.

two sentences each having a main verb with its own lexical entry. The lexical entry for the matrix verb, the hypothetical NDI 'to cause' can be anything we want to make it since it is an abstraction created only for the purpose of deriving STEM+NDI IC verbs, but the lexical entry for the stem verb, the one in the embedded sentence, would have to account for what we know about the use of that verb in all contexts. What we have shown is that when we allow the full generation of sentences in embedded sentence allowed by the lexical entry for the stem verb we get deep structures that require transformational machinery to filter bad co-occurrences out and rearrange constituents in poorly motivated ways.

By using transformations to account for the possible co-occurrence of grammatical relations with the verb stems, we would be violating the theoretical criterion we have posited as checks on the power of transformations. We would be allowing transformations in effect to change the value of verbs as propositional heads.

If on the other hand we treat the co-occurrence restrictions after STEM+NDI IC verbs as applying within a simplex sentence in deep structure with a single lexical entry for one main verb, the situation becomes much more manageable.

There are several aspects in which IC verbs are idiosyncratic and the idiosyncracies themselves mitigate against the Complex Sentence Hypothesis. First, there are idiosyncracies concerning which stems can and cannot take -ndi to form IC verbs, e.g. koosu 'to slaughter' is related to koosundi 'cause to slaughter', but wi 'kill' has no corresponding IC verb *windi ('to cause to kill'); similarly, dumbu 'to sever' is related to dumbundi 'to cause to sever', but kayrey 'to shatter' has no corresponding IC verb, *kayreyndi ('to cause to shatter').
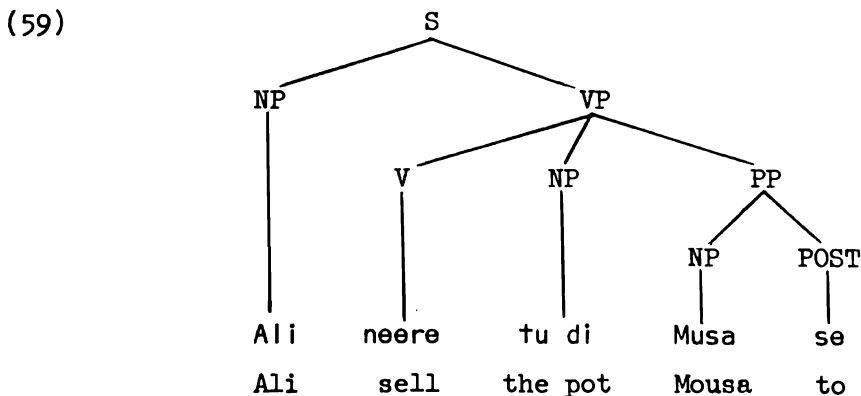
Another idiosyncracy is the syntactic co-occurrence restrictions on IC verbs; there are differences that cannot be explained by reference to lexical entries of the stems. It appears rather that syntactic co-occurrence restrictions are a property of the IC verbs themselves. We will cite one instance here. Some IC verbs can be used intransitively-elliptically, with their objects understood. For example, ŋandi 'to

we have ordered morphological processes, with causative formation and passive formation strictly ordered, although WS conditions can make comparable generalizations; in case passives were proved to be lexical, it would be even more implausible to consider causatives as products of syntactic transformations.[11]

We conclude by saying the IC verbs, like DC verbs, are lexical items, produced by lexical rules. The deep structure configuration for sentences such as (41) with hinandi 'to cause to cook' is the same as that for (5) with neere 'to sell', i.e. with the simplex sentence in (58) below representing the deep structure for 'Garba had Ali cook eggs':

(58)

```
                        S
            ┌───────────┴──────────────┐
           NP                          VP
            │          ┌────────────┬───────────────┐
            │          V           NP               PP
            │          │            │           ┌────┴────┐
            │          │            │           NP       POST
            │          │            │           │         │
         Garba      hinandi   goroŋgo tondi yo  Ali       se
         Garba    cause-to-cook       eggs      Ali       to
```
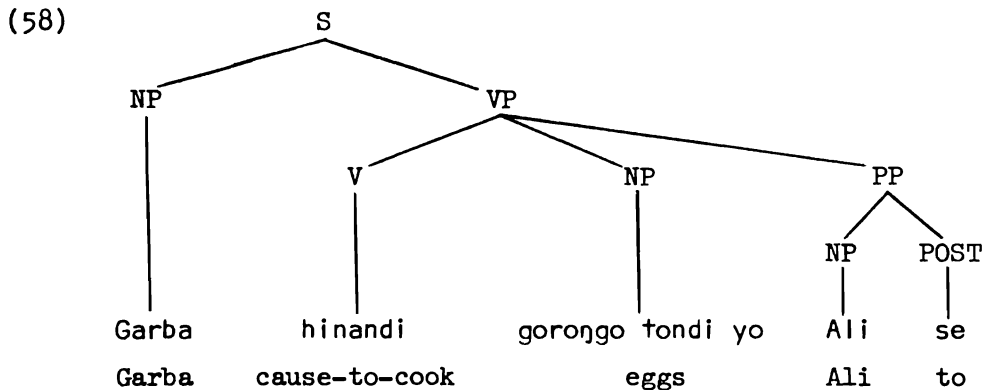
The simplex sentence in (59) will then represent the deep structure for 'Ali sold the pot to Mousa':

(59)

```
                       S
             ┌─────────┴────────────┐
            NP                      VP
             │          ┌───────┬───────────┐
             │          V      NP           PP
             │          │       │       ┌────┴────┐
             │          │       │       NP       POST
             │          │       │       │         │
            Ali       neere   tu di    Musa       se
            Ali        sell   the pot  Mousa      to
```

___

[11]Fred Householder informs us that in Turkish, too, where passive and causative verbs are formed by suffixation, the causative suffix can never follow the passive, only be followed by it; moreover, Turkish can have two causative suffixes in a row followed by a passive, just as in Sonrai, e.g. (57).

suffixes in a row in an English sentence like "I began stopping working
at 7 o'clock." Even three -ndi suffixes seem marginally acceptable,
e.g.

(57)   [[STEM+NDI]+NDI]+NDI: [[DC]+IC]+PASSIVE
       Tasu di ŋandindindi   Musa se
       rice the be-caused-to-be-the-object-of-feeding Mousa to
       'The rice was caused to be the object of (someone's) feeding
       to Mousa (by someone)'

What is crucial in the instances with more than one -ndi is that
there are no cases where -ndi is added to a passive form. In the
Complex Sentence Hypothesis it would, after the first cycle, be possible
to have a sentence such as (4) as the embedded clause under NDI 'to
cause' as main verb, that is the passive 'The rice was eaten'. Then a
sentence of the form of (56) ought to allow an interpretation appropri-
ate for the causative of a passive 'Garba had the rice eaten by Ali' or
'Garba had the rice eaten for Ali'. But such an interpretation is not
possible. Some third person is understood as the one who feeds Ali, or
the one who causes Ali to eat, an interpretation possible only when
there is a double causative construction.

Whatever the status of the passive is, this is strong evidence
against the Complex Sentence Hypothesis. We assume that -ndi is
added by a process of suffixation, i.e. at the end. If the passive is
formed by a syntactic transformation, the hypothetical embedding rule
for causative formation would have to be constrained by a very unnatural
condition, i.e. the rule will not apply if passive has applied on the
lower cycle. If the passive is formed by syntactic transformation and
sentences like (43) and (45) are simplexes in deep structure, then the
data receives the most natural explanation: passive can be involved in
multiple -ndi verbs only when it adds the last -ndi to the verb.
The penultimate -ndi or the ante-penultimate one can only be causa-
tive, since causatives are formed in the lexicon before lexical inser-
tion, and before syntactic transformations begin. If the passive is
formed lexically as well, then we might have evidence for saying that

transformationally: they pass the two tests that we have described. Passivization does not change node labels and it does not change the value of lexical items as propositional heads.

The passive could be characterized as an elliptical variant of the active. For every passive of the form $[NP_2 \ V+ndi]$ there is always a corresponding active of the form $[NP_1 \ V \ NP_2]$. The passive has the same meaning as the active except that there can be no NP_1 expressed; however, whatever semantic function would be associated with NP_1 in the corresponding active sentence is understood in the passive sentence. Consider the following paradigm of examples with ba 'to break'. A similar paradigm could be presented for any of the <u>object middle verbs</u> cited in (23). ACTIVE sentences are:

(61) Garba   ba   feneter di $NP_1 \ V \ NP_2$
      Garba break window the
      'Garba broke the window'

(62) Garba   ba   feneter di nda tondi di $NP_1 \ V \ NP_2 \ nda \ NP_3$
      Garba break window the and stone the
      'Garba broke the window with the stone

(63) Tondi di   ba   feneter di $NP_3 \ V \ NP_2$
      stone the break window the
      'The stone broke the window'

(64) *Tondi di   ba   feneter di nda tu di   *$NP_3 \ V \ NP_2 \ nda \ NP_3$
      stone the break window the and pot the   (only one INSTRUMENT
    *'The stone broke the window with the pot'   per sentence)

(65) Feneter di   ba
      window the break
      'The window broke'

while PASSIVE ones are:

(66) Feneter di bandi (Ambiguous) $NP_2 \ V+ndi$
      window the be-broken
    'The window was broken (by someone or by something);
     NB: (66) corresponds to (64) or (63) in its semantic functions,
        and not to (65).

The difference in semantic interpretation as far as grammatical relations is concerned is accounted for by the lexical entries for the main verbs:

(60) (a)   (b)   (c)   (d)   ...
      neere   +V   [NP___NP NP se][AGENT___THEME GOAL]
                            α   β   γ   α   β   γ

      [hina] +ndi +V   [NP___NP NP se][AGENT IC [AGENT___THEME] GOAL]
                            α   β   γ   α   TH γ   β TH   γ

For the IC verb hinandi 'to cause to cook', there is abstract motion of the THEME (TH) of the main clause to the GOAL (Ali in 58); this THEME is itself the proposition governed by the STEM verb.

7. Passives in Sonrai

It is not an open and shut case that passives should be derived by syntactic transformations. It is of course possible to provide algorithms for generating passives by either syntactic transformation or lexical transformation; what is important is the justification for the choice.

We will once again approach the question by asking what syntactic transformations should not be allowed to do, given a commitment to a deep structure level where lexical insertion takes place. The strongest universal claim that could be derived from the work of Chomsky [1968] and Jackendoff [1969] on the lexicalist versus transformationalist hypotheses is that transformations should not be allowed to change node labels. For English, Chomsky gave arguments against allowing transformations to change verbs into nouns and Jackendoff gave arguments against allowing transformations to change adjectives into adverbs. But none of the processes we have been discussing would violate that constraint, i.e. neither DC formation, nor IC formation nor Passive formation change node labels; we are dealing with verb-to-verb derivation rules.

We have proposed a still stronger claim: transformations should not be allowed to change the value of lexical items as propositional heads. This is a principle that will apply whether or not a derivational process changes node labels. We have shown why this principle is of central importance to grammatical theory, and have proceeded to apply it to the causative data to argue that causatives cannot be derived transformationally. Passives, in contrast to the causatives, however, could be derived

As a description of a natural disaster, this sentence is not para-phrasable by either of the following two:

(69) Boro fo kukur subu di kul
      someone burn grass the all
      'Someone burned all the grass'

(70) Haya fo   kukur subu di   kul
      something burn grass the all
      'Something burned all the grass'

It is equally important, on the other hand, to keep in mind that sentence (55) is not paraphrasable by the following active intransitive sentence:

(71) Subu di kul kukur
      grass the all burn
      'All the grass burned'

In this last sentence the burning is understood to be a spontaneous event, cf. (65), whereas in (68) the semantic function AGENT or INSTRU-MENT is understood as the direct cause of the event. But if having a deleted by someone or by something in English is dubious, it is even more so in Sonrai. In English it would be a case of partial neutralization; in Sonrai it would be a case of absolute neutralization; the AGENT or INSTRUMENT corresponding to deep structure subject position are never expressed in passives. The Sonrai data lends theoretical support to the treatment of agentless passives in Chomsky [1965] and Emonds [1969] in which no lexical material is inserted for the deep structure subjects of agentless passives. Following Chomsky and Emonds in this respect, we could propose (72) as the deep structure for (68), (73) as the rule that creates passives, and (74) as the out-put, i.e. where the triangle symbol means 'lexically empty'. This analysis follows closely that of Emonds [1969] for agentless passives in English:[12]

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[12]In our formulation, were we to adopt a theory that required empty phrase nodes as receptacles for the contents of full ones to be moved

(67)   Feneter di bandi   nda tondi di   NP$_2$ V+ndi nda NP$_3$
       window the be-broken and stone the
       'The window was broken (by someone) with a stone' (cf. (62))

With verbs like ŋa 'to eat', ɲin 'to drink', mow 'to hear',
guna 'to see', hay 'to give birth to', jow 'to take', lenje 'to
carry', kar 'to beat', garey 'to chase away', verbs which take only
animate subjects in the active voice, an animate being is understood
though not expressed in the passive. With cow 'to learn' and warra
'to throw', which take only human subjects in the active voice, there is
always a person understood but not expressed in the passive. Thus one
of the main arguments in support of the passive in Chomsky [1957], the
one concerning selectional restrictions, applies to Sonrai as well, with
the interesting twist that we are talking about a part of the meaning
which is always understood in active-passive sentence pairs, but which
is syntactically manifested only in the active.

The above evidence shows that grammatical relations and selectional
restrictions in passives are identical to those in a subset of the pos-
sible active sentences in which the same verb occurs. That subset of
active sentences is definable syntactically: those sentences that
have NPs in object position. This makes it appear quite plausible that
passive formation takes place after deep structure and after lexical
insertion.

How the passive is best defined in Sonrai is an interesting problem
in itself. Recall that in Katz-Postal [1964] agentless passives are
generated with an underlying someone or something in deep structure
subject position which is deleted after being moved into the by phrase.
But this is a dubious procedure even for English: 'Germany was defeated'
(from [Emonds 1969]) is certainly not paraphrasable by either 'Germany
was defeated by someone', or 'Germany was defeated by something'. Simi-
lar sentences exist in Sonrai, e.g. from kukur 'to burn' (an object
middle verb like ba 'to break'):

(68)   Subu di kul kukurndi
       grass the all be-burned
       'All the grass was burned'

(73)   X, [Δ   ], X, V, NP, X
       1 NP 2 NP   3 4 5 6 ⟹ 1, Ø, 5, 3, V>4+ndi, 6

   <u>Condition</u>: 2 and 5 are clause mates

The application of (73) to the deep structure (72) will then result in:

(74)

```
                        S
              _____/  _____
            NP                    VP
            |                     |
            |                     V
            |                   /   \
       subu di kul      [v kukur v] +ndi

       all the grass         be-burned
```
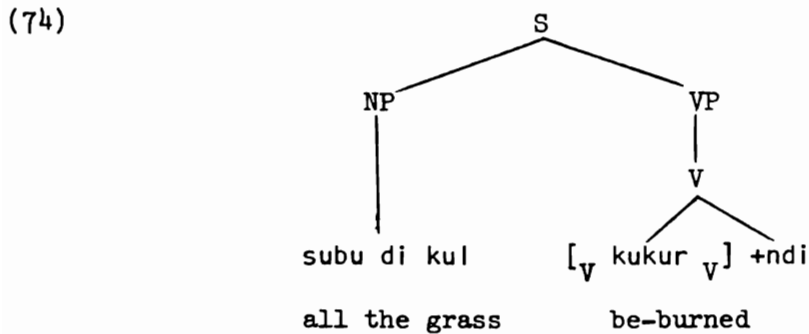
The semantic interpretation for (68) can be accounted for by the
theory of grammatical relations that we have proposed. Grammatical re-
lations are read from the lexical entries for propositional heads, on
deep structure trees. Below is the lexical entry for kukur 'to burn'.
Either line (i) or (ii) could be selected for the semantic interpretation
since the semantic configuration corresponds to transitive configuration,
cf. deep structure (72):

(75)   (a)   (b)   (c)   (d)   (e)
  (i)   kukur, +V, [NP___NP (nda NP)][AGENT___THEME(INSTRUMENT)], change of
  (ii)   [NP___NP]   [INSTRUMENT___THEME]   state...
 (iii)   [NP___]   [THEME___]

   Since deep structure (72) has a configuration corresponding to lines
(i) and (ii) of the lexical entry for kukur one of the two templates
from those two lines must be imposed for semantic interpretation, and
thus either AGENT or INSTRUMENT must be interpreted, even though there
is no syntactic manifestation of it on the surface.

   This analysis, to make an analogy to work in phonology by Kisseberth,
makes the passive look like part of a syntactic conspiracy to insure
having a subject for sentences in surface structures. In current theory
it would be possible to claim that the subject NP is the one obligatory
NP node generated by the PS rules. An empty NP node with no lexical

(72)

```
                        S
              _____/ _____
             NP                  VP
             |                 _/  \_
             |                V      NP
             |                |      |
             Δ              kukur  subu di kul
                            burn   all the grass
```
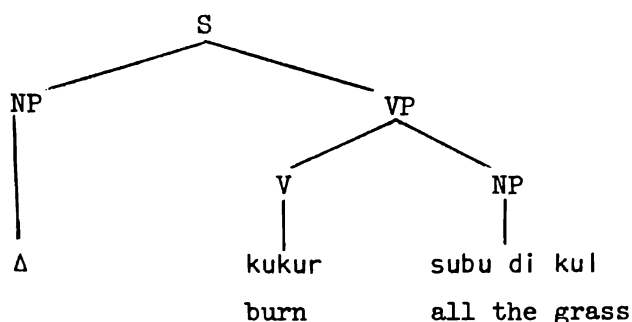
one could then describe object raising in Sonrai as:

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into, we still would not need to leave empty nodes behind after movement transformations have applied. In the preliminary version of Chapters I and II of his thesis, Emonds needs the device of empty nodes left behind after a movement transformation for his formulation of the full English passive and the process of there insertion, but we have no comparable cases in Sonrai. Emonds has stipulated that empty nodes can be deleted in surface structure provided that they have been filled at some point during the derivation. But this formalism, part of a system designed to constrain the power of transformations, will in fact allow power in transformational grammars which probably no one would want to say within the domain of natural language. A reductio ad absurdum involves a hypothetical transformational process not very different from the Complex Sentence Hypothesis we have tried to argue against for Sonrai indirect causatives: imagine a deep structure complex sentence with nested embeddings 500 clauses deep where only the last clause down is lexically filled; then imagine a transformation that moves all lexical material from a subordinate clause into its matrix; this transformation operates cyclically empty phrase nodes as it goes; on the first cycle the 500th clause is emptied of lexical material and all the phrase nodes of the 499th clause are properly filled, the 500th clause remains a set of empty phrase nodes, and so on, on up the tree. After the last cycle the topmost clause is lexically filled and the 499 other clauses are nothing but empty phrase nodes. All the empty phrase nodes can be deleted because they have been filled at some point in the derivation; what happens to the S nodes is not clear to us (they are called phrase nodes too), but it would not be inconsistent for them to be deleted too. So in the end only a simplex sentence would be left. All sentences could have infinite structural ambiguity with this grammar: the sentence in question could have had 501 clauses instead of 500, etc. As an alternative to Emonds' formalism, we are working on a structure-preserving constraint based on lexical entries for propositional heads (cf. Shopen [forthcoming]).

(77)   Kalil   ka   farikoy   NP$_1$ V NP$_2$
   Kalil became farmer
   'Kalil became a farmer'

(78)   *Farikoy   kandi   NP$_2$ V+ndi
   farmer be-became
   'A farmer was become'

Even if it were established that passivization changed meaning, per-
haps that the -ndi added to verbs to form passives carried meaning
with it, it could still be argued that passive is a legitimate transfor-
mation, since it does not violate either of the criteria that we have
suggested: it does not change node labels, and, although it changes
meaning, it doesn't change the part of meaning which concerns the func-
tion of lexical entries as propositional heads--it does not change
grammatical relations.

We cannot end our discussion without pointing out what could be
gained if passives were derived lexically. Let us point out first that
not so much would be lost as one might think.

True, adding passive forms to the lexicon increases the number of
lexical entries. But we have already shown that on independent grounds
there is a need for word structure conditions concerning grammatical
relations in order to account for systematic aspects of linguistic
competence, cf. our discussion of WS conditions to account for the
systematic relation between causative and non-causative verbs. A
Passive WS condition could show the systematic relation between active
and passive verb forms. A paradoxical situation exists here with
respect to <u>cost</u> to the grammar: the more productive passive-formation
is, the more material would be added to the lexicon, but at the same
time the more generality and the more importance a Passive WS condition
would have. Although passive-formation is very productive it is also
very simple and regular in its form-meaning relation to active sentence
formation. Thus, we could say that the language learner learns passive-
formation largely in terms of the Passive WS condition, and the long
list of items added to the lexicon would seem to have very little cost.

material would have no value in surface structure, since there would be no way to give it a phonological interpretation. If subjects are obligatory elements in surface structure sentences of most kinds, they have to be lexically filled. The creation of passives helps bring this about. The existence of empty nodes in deep structure could be claimed to have independent motivation for just such a construction as the Sonrai passive, since it supplies the appropriate configuration for deep structure semantic interpretation.

While we are much in agreement with Emonds' proposal for a structure preserving constraint on transformations in its general conception, we find no need for the device of empty nodes. The lexical entries for propositional heads already carry sufficient information about ideal tree structure to themselves apply the structure-preserving constraint. There is no space here to discuss the alternate approach in detail, (cf. Shopen [forthcoming]), but we feel that a better transformational solution to the Sonrai passive would involve the generation of an elliptical deep structure tree, i.e. with no subject. The lexical entry for the propositional head would allow for semantic interpretation of the elliptical structure supplying the semantic function for the missing NP. The same lexical entry would allow the Object Raising transformation to apply moving object NP into subject position, since the lexical entry for all verbs allows subject NPs. Thus, alternatively, the deep structure for (68) will be given not as (72), but rather as:

(76)

```
                        S
                        |
                       VP
                      /    \
                    V        NP
                    |        |
                  kukur    subu di kul
                  burn     all the grass
```
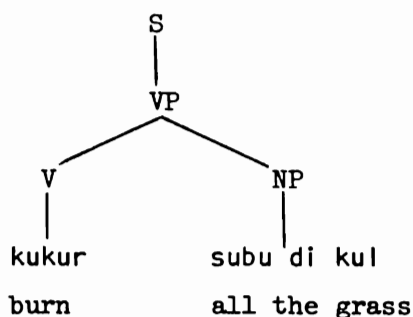
It appears that the passive transformation changes meaning. One evidence of this is that there is something semantically incompatible about the passive and the meaning of certain verbs that occur in the context [NP___NP] in the active voice, cf. English:

heads never govern meaning or co-occurrence restrictions beyond the simplex sentence; indeed, they can govern less than the simplex S, as when sentence adverbs are involved, or when the propositional head is the head noun of an NP in a simplex and not the head of the S as a whole. In stating the passive transformationally it is necessary to constrain it to simplexes, but no WS condition of the kind we are discussing can have a scope greater than the simplex S, so no such constraint need ever be stated.

Talmy Givón has pointed out to us that it is doubtful that any syntactic transformation must be ordered before the passive in any language. This is the case for Sonrai: as far as we know, there is no syntactic transformation that precedes the passive. Thus, we have also argued against a Sonrai Dative Shift transformation (see Section 6), which, if it existed, would have to be ordered before the passive. This doesn't in itself provide a proof of the location of the passive rule in the grammar, but it does leave the way open for putting it in the lexicon.

Passives are not strictly regular from a syntactic point of view, e.g. (77) and (78), and the idiosyncracies could be more easily captured with a lexical analysis.

A major benefit from a lexical analysis of passives is that a major class of expressions could be generated in a much less complicated fashion: infinitives. Infinitives on surface structure are typically subjectless clauses preceded by a subordinating conjunction; in many languages it is also the case that there are certain auxiliary verb or adverbial elements that cannot occur in infinitives. Infinitives are analyzed as Conjunction S in many cases only because there are passive infinitives and it is believed that there must be a full S for the passive to be derived transformationally. If passives were lexical, however, infinitives could be simply Conjunction VP in deep structure.

All of this gives a perspective of a grammar in which greater importance is given to lexical entries for propositional heads and the transformational machinery is less complicated. Transformations would then be confined to essentially one function: the permutation of words.

Given that the relation to items already in the lexicon is regular, it
seems that the longer the list of items added to the lexicon, the less
the cost!

Let us say that an elliptical semantic function is one which is
understood though not expressed and that it can be represented as an
obligatory part of the semantic template of a propositional head which
is not manifested syntactically. Thus, with (74) as the deep structure
for (68), 'All the grass was burned', the possible interpretations of
the sentence could be accounted for by the following continuation of
lexical entry (75) for kukur 'to burn':

(79)   (a)   (b)   (c)   (d)   ...

$$(iv) \quad [\underline{\quad}] \quad +ndi \quad +V \quad [NP\underline{\quad}(nda\ NP)] \begin{cases} [AGENT\underline{\quad}THEME\ (INSTRUMENT)] \\ \qquad\quad \alpha \qquad\qquad \beta \\ [INSTRUMENT\underline{\quad}THEME] \\ \qquad\qquad\quad \alpha \end{cases}$$

Then WS conditions of the following form would also be appropriate
(where X, Y and Z are variable constants): first, the Passive Condition:

$$(80) \quad [NP\underline{\quad}NP\ X][Y\underline{\quad}THEME\ Z] \supset [NP\underline{\quad}X][Y\underline{\quad}THEME\ Z]$$
$$\quad\ \alpha\quad\beta\quad \alpha\qquad \beta \qquad\qquad \alpha \qquad\quad \alpha$$

then, a more general condition:

(81)   GR Condition (80) $\supset$ MF Rule (34)

GR Condition (80) says that if a lexical entry allows insertion in
a deep structure environment with an object NP, then it will also allow
the passive. Condition (81) says passives have the form V+ndi.

It might be said that (80) and (81) together have the same effect
as the passive transformation, that we are proposing WS conditions that
give the grammar the same power as transformations, that our theory is
a notational variant of generative semantic theory with prelexical
transformations. The change in indexing in (80) amounts to a permutation.
There is, however, a crucial difference in <u>domain.</u> These conditions
concern grammatical relations in lexical entries for propositional heads,
and not trees of potentially infinite expansion. The <u>maximum</u> possible
domain is the simplex sentence since it can be shown that propositional

wafakundi	'to reconcile'	wafaku	'to agree with'
suburndi	'to mediate'	subur	'to tolerate'
nondi	'to denounce, sell out'	no	'to give'
bayndi	'to inform'	bay	'to know'
fahamndi	'to explain'	faham	'to understand'
mowndi	'to interpret, translate'	mow	'to hear'

APPENDIX: Direct causative verbs ending in -ndi

A. <u>From intransitive stems:</u>

kamndi	'to drop'	kam	'to fall'
jumbundi	'to take down'	jumbu	'to go down'
jijindi	'to take up'	jiji	'to go up'
fattandi	'to take out'	fatta	'to go out'
tondi	'to take to, complete'	to	'to arrive'
timmendi	'to complete'	timme	'to be complete'
yendi	'to take back'	ye	'to go back'
kayndi	'to stop, decide'	kay	'to stop'
tundi	'to start (a car)'	tun	'to get up'
hunandi	'to feed, support'	huna	'to live'
kumandi	'to reduce'	kuma	'to be lacking'
dereyndi	'to lose'	derey	'to get lost'
kandi	'to put to bed'	kani	'to lie down'
gorondi	'to seat'	goro	'to sit down'
nimsindi	'to punish'	nimsi	'to be regretful'
farandi	'to tire out, annoy'	fara	'to get tired'
hemndi	'to make cry'	hem	'to cry'
hereyndi	'to starve'	herey	'to be hungry'
dukurndi	'to anger'	dukur	'to be angry'
kondi	'to dry'	ko	'to dry'
teyndi	'to wet, soak, dampen'	tey	'to be wet'
korondi	'to heat'	koron	'to be hot'
yeyndi	'to make cold'	yey	'to be cold'
borindi	'to beautify'	bori	'to be beautiful'
merundi	'to make ugly'	meru	'to be ugly'
jendi	'to make old, to wear out'	jen	'to be old'
tawondi	'to renew'	tawo	'to be new'
karandi	'to make yellow'	kara	'to be yellow'
firjindi	'to make green'	firji	'to be green'
cireyndi	'to make red'	cirey	'to be red'
koreyndi	'to make white'	korey	'to be white'
dungurandi	'to shorten'	dungura	'to be short'
berndi	'to honor'	beri/ber	'to be big'
kaynandi	'to insult, reprimand'	kayna	'to be small'
cinandi	'to reduce'	cina	'to be small'
jurndi	'to ride'	jur	'to run'

B. <u>From transitive stems:</u>

ŋandi	'to feed'	ŋa	'to eat'
ɲindi	'to feed (liquid)'	ɲin	'to drink'
hayndi	'to empregnate'	hay	'to give birth to'
cowndi	'to teach'	cow	'to learn, study, read'

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