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Robert K. Herbert
Department of Linguistics
Ohio State University
Columbus, Ohio 43210

HIERARCHIES OF NATURAL TOPIC IN SHONA

Annie K. Hawkinson and Larry M. Hyman
Department of Linguistics
University of California, Berkeley

1. Introduction

There has been considerable interest recently in the relationship
between universal semantics and language-specific syntax. Certain logi-
cal relations are assumed to underlie all languages, which, in turn,
"syntacticize" to a greater or lesser extent these universals by well-
defined means. For example, since the recipient and the benefactor of
an action are typically presupposed to be human beings, languages tend
to associate their underlying grammatical cases accordingly. Further,
since these semantic features usually correlate with dative and benefac-
tive case relations, some languages may exploit this redundancy for
syntactic purposes. In this paper, we shall examine the interaction of
such redundancies with syntactic considerations in the determination of
case relations by speakers of Shona, a Bantu language spoken in Zimbabwe.[1]

     We should like to emphasize that in discussing the Shona data we
shall not be arguing for any particular (competence) model of grammar.
We shall limit our discussion to the motivation of the facts to be pre-
sented, i.e. why speakers create the sentences they do in Shona, and
to the problems listeners have in interpreting these sentences. Since
we were able to work with only one speaker of Shona, we found it most
effective to focus on how our informant interpreted sentences which

2. Animacy

Languages of the Bantu family are characterized grammatically by a number of different noun classes. Although the members of each noun class do not exhibit consistent semantic properties, the fact that animacy may play a role in Bantu grammar is evidence due to the nature of the correlations which do exist:

(1)   Classes 1/2   :   Human referents only

6a   :   Mass/liquid nouns

7/8   :   Inanimate "thing" referents

9/10   :   Animals (also some non-animate referents)

In constructions where a noun of one class is conjoined with a noun from another class, differences in "gender" will have to be (a) resolved in favor of one particular gender or (b) avoided through the use of certain other syntactic constructions. The treatment of conjoined noun phrases provides evidence for how such conflicts are treated in a given language. In Shona, both strategies are possible:

(2) a.   mùrúmé á-kà-fámbá né ìmbwá   'the man walked with the dog'

man   he-pst-walk with dog

b.   mùrúmé né ìmbwá vá-kà-fámbá   'the man and the dog walked'

man   and   dog they-pst-walk

The difference between these two constructions involves the type of event being described. In (2a) the man and the dog are seen to be walking together (single event); in (2b) the man's walking and the dog's walking are separate events. The first construction avoids any gender conflict; the second sentence involves resolution of the gender difference between 'man' and 'dog' in Shona's noun classification schema.

If two nouns of differing gender are conjoined in Shona, the conflict is resolved in favor of the more animate being: if any member of

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either we or he himself constructed. Thus, although we shall often speak of interpretation and of assigning nouns to underlying case relations, we are not advocating the interpretivist approach to generative grammar. Quite to the contrary, we shall emphasize the role of semantics and pragmatics in syntax.

the conjunct is human, the difference is resolved in favor of that noun;
if not, and if any member is an animal, the difference is resolved in
favor of that noun; finally, if all the conjuncts are inanimate and do
not belong to the same noun class (there are several inanimate noun
classes), the conflict is resolved into class 7/8 (inanimate) as seen
below:

(3)   mùrúmé + mwàná → vá...
    class 1 :   'man'   'child'   they (human: plural class 2)

              ìmbwá + shìrì → dzí...
    class 9 :   'dog'   'bird'   they (animal:plural class 10)

              chìgàrò + chìpó → zví...
    class 7 :   'chair'   'present'   they (inanimate:plural class 8)

              bádzá + bángá → má...
    class 5 :   'hoe'   'knife'   they (class 6, pl. of cl. 5)

              mùrúmé + ìmbwá → vá...
    cl. 1-9 :   'man'   'dog'   they (class 2)

              ìmbwá + chìpó → dzí...
    cl. 9-7 :   'dog'   'present'   they (class 10)

              chìpó + bángá → zví...
    cl. 7-5 :   'present' 'knife'   they (class 8)

Not only is it incorrect to resolve gender differences in favor of a less
animate noun; it is equally incorrect to list such a referent <u>before</u> the
more animate noun in a conjunct:

(4) *mùrúmé né ìmbwá <u>dzá</u>-kà-fámbá[2]   'the man and the dog walked'
        man and dog they-pst-walk   (with resolution to animal cl. 10)

    *ìmbwá né mùrúmé vá-kà-fámbá   'the dog and the man walked'
        dog and man they-pst-walk   (with 'dog' preceding 'man')

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[2]In glossing our examples we shall not be entirely faithful to the
underlying morphology. Thus, in the first example of (4), a more felici-
tous morphological analysis would be dzì-ákà-fámbá. The same is true of
many of the other cited examples.

The hierarchy of importance according to considerations of "animacy" in Shona is therefore (1) human, (2) animal, (3) inanimate.

Such considerations are not always used in Bantu langauges. In fact, Givón [1970] has noted that the languages which he studied all prefer the construction using the preposition 'with' which avoids principles of gender resolution altogether. Further, if any conjunction was used the gender differences were resolved in favor of the inanimate 7/8 gender regardless of any differences in the animacy status of the nouns involved.

3. <u>Grammar</u>

While there appears to be a bias in favor of animacy which can affect the surface form of sentences in certain instances, there are also grammatical considerations which determine the positioning of elements in sentences. In the simple active sentence the subject precedes the verb and a direct object noun follows it:

(5)　　mùrúmé á-kà-nyórá tsámbá　　'the man wrote a letter'
　　　　man　he-pst-write letter

When an indirect object, representing benefactive or dative case relations, is present, an "applied" suffix -er-/-ir- is added onto the verb to supply the notion of "prepositionality". The object to which the verb is then rendered "in prepositional relation to" directly follows the derived verb:

(6)　　mùrúmé á-kà-nyór-ér-á　　mwàná tsámbá　　'the man wrote a letter
　　　　man　he-pst-write-to/for child letter　　to/for the child'

While the applied suffix can reorient the verb either benefactively or datively, the more common reading of (6) is 'for the child' rather than 'to the child'. If the dative case relation is to be unambiguously specified, the dative can be postposed and preceded by the preposition kù 'to':

(7)　　mùrúmé á-kà-nyórá tsámbá kù mwàná　　'the man wrote a letter to the
　　　　man　he-pst-write letter to child　　child'

　　　*mùrúmé á-kà-nyór-ér-á tsámbá kù mwàná
　　　　man　he-pst-write-to letter to child

Since it is also possible to postpose the benefactive object with a preposition,[3] it would appear that the benefactive has high priority in claiming the object position in the prepositional construction. This proves to be the case in constructions where both a benefactive and a dative object are present:

(8) mùrúmé á-kà-nyór-ér-á mwàná tsàmbà kù mùkàdzí
     man   he-pst-write-for child letter to woman
     'the man wrote a letter for the child to the woman'

It should be noted that tsàmbà 'letter', the direct object of the simplex verb nyórá 'write', can be ordered before mwàná 'child', as seen in (9),

(9) mùrúmé á-kà-nyór-ér-á tsàmbà mwàná kù mùkàdzí
     man   he-pst-write-for letter child to woman
     'the man wrote a letter for the child to the woman'

since the human status of 'child' is sufficient in assigning it to the benefactive case. That the position immediately following the applied verb belongs syntactically to the indirect object is evidenced in sentences where both objects are human:

(10) mùrúmé á-kà-chéká mwàná   'the man cut the child'
     man   he-pst-cut child

     mùrúmé á-kà-chék-ér-á mùkàdzí mwàná   'the man cut the child for
     man   he-pst-cut-for woman   child   the woman'

     mùrúmé á-kà-chék-ér-á mwàná mùkàdzí   'the man cut the woman for
     man   he-pst-cut-for child woman   the child'

We should like to suggest that the benefactive object, and the dative object when no benefactive is specified, is in a grammatical direct object

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[3]In such situations the preposition used is the "associative" marker (with its concord prefix), which is used to mark possession:

     mùrúmé á-kà-nyórá tsàmbà yé mùkàdzí   'the man wrote the letter for
     man   he-pst-write letter of woman   the woman' (lit. the man
                                                wrote the woman's letter)

relation to the applied verb form. In order to avoid confusion, we shall
refer to the noun immediately following the active form of a verb as the
<u>proximate</u> object, as suggested to us by Talmy Givón. Further evidence
for the notion "proximate object" is seen from the fact that the benefac-
tive/dative object is topicalized in the same way as the direct object
of the underived verb stem, as seen in (11):

(11) a.   á-kà-nyórá tsámbà   'he wrote a letter'
               he-pst-write letter

      Topic: tsàmbà, á-kà-yí-nyórá   'the letter, he wrote
               letter he-pst-it-write   it'

      b.   á-kà-nyór-ér-á   mwàná tsàmbà   'he wrote the child
               he-pst-write-to/for child letter   the letter'

      Topic: mwàná, á-kà-mú-nyór-ér-á   tsámbà   'the child, he wrote
               child he-pst-him-write-to/for letter   him the letter'

Further, once the applied suffix is added, the direct object to the origi-
nal verb stem cannot be topicalized in this way:

(12) *tsámbà, á-kà-yí-nyór-ér-á   mwàná   'the letter, he wrote it
      letter he-pst-it-write-to/for child   to/for the child'

    In both the simple and prepositional constructions only the under-
lying agent has grammatical access to the subject slot. However, when
such constructions are passivized, the agent is moved out of that posi-
tion and postposed with the preposition né 'by'. Grammatically, the
noun which was in proximate object relation to the verb as just defined
(i.e., that immediately following the verb), is moved into subject posi-
tion. Thus, sentences (5) and (6) are passivized as in (13) and (14):

(13) tsàmbà yá-kà-nyór-w-à   né mùrúmé 'the letter was written by
     letter it-pst-write-pass. by man   the man'

(14) mwàná á-kà-nyór-ér-w-á   tsámbà né mùrúmé
     child he-pst-write-to/for-pass. letter by man
     'the child was written a letter by the man'

In (14) the letter was written either to the child or for the child. What is important is that an underlying dative (i.e., 'to the child') will move into subject position only if there is no underlying benefactive (i.e., 'for the child') in the same sentence. If both are present, the benefactive claims the subject position, just as it claimed proximate object position in the corresponding active construction:

(15) mwàná á-kà-nyór-ér-ẁ-á   tsámbà né mùrúmé kù mùkâdzí
      child he-pst-write-for-pass. letter by man   to woman
      '(for) the child was written a letter, by the man, to the woman'

While such a sentence is not readily translated into good English syntax, in (15) the man has written the letter to the woman on the child's behalf (e.g. the child did not know how to write a letter himself).

The grammatical hierarchy of accessibility to the subject slot is then:

(16) (1) subject in active sentences (both simplex and applied verbs)
      (2) accusative object in simplex passive sentences
      (3) benefactive object
      (4) dative object (if an underlying benefactive is absent or left unspecified[4])

The same hierarchy also determines which items have access to the object slot for pronominalized elements in the Shona verb complex. In simplex verbs, an accusative object pronoun is prefixed directly in front of the verb stem:

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[4]It is necessary to clarify the notion "specified benefactive". Benefactives can be of two types: one being 'on behalf of', the other being 'intended for'. The second type can be said to be "unspecified" to the extent that it may be replaced by a phrase with the preposition 'to': a letter intended for the woman; a letter to the woman. The only difference between this 'for' and 'to' is that the latter implies direction. The specified benefactive is that representing the underlying notion of 'on behalf of' and it is this which preempts the underlying dative in the constructions described. In English, this notion may also be left unspecified: he wrote a letter for me can mean 'intended for me, for my benefit' (e.g. because he wanted to tell me something) or 'on my behalf' (e.g. because I was too tired to write it myself).

(17)   mwàná á-kà-nyórá tsámbà → mwàná á-kà-yí-nyórá
       child he-pst-write letter   child he-pst-it-write

                                          'the child wrote it (the letter)'

This is the same position which the pronoun markers occupied when object
nouns were topicalized in (11). As was seen there, the object marker of
the prepositionally derived verb also moves into that position when a
benefactive or dative noun referent is pronominalized:

(18)   mwàná á-kà-nyór-ér-á   mùkâdzí → mwàná á-kà-mú-nyór-ér-á
       child he-pst-write-to/for woman   child he-pst-her-write-to/for
       'the child wrote to/for the woman'   'the child wrote to/for her'

And as before, the more frequent interpretation of this sentence will be
'for her' (i.e., 'on her behalf'). If the speaker wishes to make clear
that the letter was written to someone the pronoun must be postposed and
the verb returns to its simple (non-appled) form:

(19) mwàná á-kà-nyórá kwàárì   'the child wrote to her (the woman)'
     child he-pst-write to her

   *mwàná á-kà-nyór-ér-á kwàárì 'the child wrote to her'
   child he-pst-write-to to her

4. Case

   Since both the object to the simplex verb and the object to the pre-
positionally derived verb behave syntactically as direct objects to the
verb which they follow, it is proposed that traditional notions of sub-
ject, direct object and object of the preposition are inadequate to des-
cribe the differential treatment which Shona syntax accords to particular
surface objects. In fact, it is only by reference to underlying case
relations, rather than to these more superficial grammatical structures,
that the acceptability and interpretation of more complex constructions
can be accounted for.

   Another grammatical strategy relevant to this discussion is the
causative suffix -ìs-/-es- which is also attached to the verb. The
grammatical relation of the underlying agent of the "embedded" verb

parallels that described for the direct object to the simplex verb and the indirect object to the prepositional verb:

(20) mùkâdzî á-kà-chékấ zánzè   'the woman cut the fruit'
        woman she-pst-cut fruit

      mùrúmé á-kà-chék-és-á mùkâdzì zànzè   'the man made the woman cut
      man   he-pst-cut-cause woman fruit   the fruit' (*the man made
                                               the fruit cut the woman)

As seen earlier in (9), the object order can be reversed if the animacy status between the objects is sufficient to allow the proper interpretation of the sentence as seen in (21):

(21) mùrúmé á-kà-róv-és-á mwàná mùtî   'the man made the child hit the
      man   he-pst-hit-cause child tree   tree'

      mùrúmé á-kà-róv-és-á mùtî mwàná   'the man made the child hit the
      man   he-pst-hit-cause tree child   tree'

Neither of these can be interpreted as *the man made the tree hit the child. If, on the other hand, the two objects are of equal animacy their order is fixed entirely by grammatical considerations, as seen in (22):

(22) mùrúmé á-kà-róv-és-á mùkâdzî mwàná   'the man made the woman hit
      man   he-pst-hit-cause woman child   the child'

      mùrúmé á-kà-róv-és-á mwàná mùkâdzî   'the man made the child hit
      man   he-pst-hit-cause child woman   the woman'

It should be noted that when the ordering between the two object nouns in this construction is reversed, the agent noun may be preceded by the preposition né 'by' and, in fact, it must be when two objects of equal animacy are reversed:

(23) mùrúmé á-kà-róv-és-á mùtî (né) mwàná   'the man made the child
        man   he-pst-hit-cause tree by child   hit the tree'

      mùrúmé á-kà-róv-és-á mwàná né mùkâdzî   'the man made the woman
        man   he-pst-hit-cause child by woman   hit the child'

When the embedded agent is pronominalized, it also is found in the slot
directly preceding the verb:

(24)   mùrúmé á-kà-mú-róv-és-á   mùtʃ   'the man made him (the child) hit
       man he-pst-him-hit-cause tree   the tree'

Since the embedded agent is in proximate object relationship to the cau-
sativized verb, when the sentence is passivized, it moves into subject
position:

(25)   mwàná   á-kà-róv-és-w-à   mùtʃ né mùrúmé 'the child was made to
       child he-pst-hit-cause-pass. tree by man   hit the tree by the man'

   We have presented evidence that the accusative object to the simplex
verb, the benefactive or dative object to the prepositionally derived verb,
and now the agent object to the causative verb all behave syntactically as
proximate objects to the verbs which they follow. That the grammar gives
these object nouns differential treatment according to their underlying
cases becomes particularly clear when we look at sentences in which more
than one of these object nouns is present.

   It was seen in (14) and (15) that the prepositionally derived verb
places the benefactive/dative noun in subject position when passivized.
However, in some cases the underlying <u>accusative</u> can appear as subject
of a passivized verb with the applied suffix, as seen in (26):

(26)   tsàmbà yá-kà-nyór-ér-ẁ-á   mwàná 'the letter was written for
       letter it-pst-write-for-pass. child   the child'[5]

Although the accusative object is not grammatically favored in the sub-
ject position of a passive, this possibility is found when there is an
animacy differential between the underlying accusative and benefactive
nouns. However, if both the underlying accusative and benefactive are
human, passivization cannot occur as just seen in (26), since it would

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[5]The dative can be unambiguously specified in a passivized construction
by the preposition kù 'to', as follows:

       tsàmbà yá-kà-nyór-w-à   kù mwàná 'the letter was written to the
       letter it-pst-write-pass. to child   child'

change the meaning of the original sentence:

(27)

a. mùrómé á-kà-róv-ér-á mùkàozí mwàná   'the man hit the child for the
    man he-pst-hit-for woman child   woman'

b. mùkàozí á-kà-róv-ér-ẁ-á   mwàná né mùrómé   'the child was hit for
    woman she-pst-hit-for-pass. child by man   the woman by the man'

c. mwàná á-kà-róv-ér-ẁ-á   mùkàozí né mùrómé   'the woman was hit for
    child he-pst-hit-for-pass. woman by man   the child by the man'

The passive of (27a) is (27b), and not (27c), where the underlying rela-
tionships are reversed. This suggests that allowing the accusative to
passivize on the prepositionally derived verb, as in (26), is not the
normal case; it is permissible only when certain semantic criteria are
met. Thus, in terms of access to the subject position of a passivized
verb, the following hierarchy is obtained: (1) benefactive, (2) dative,
(3) accusative.

    When both a causative and an applied suffix are present on one verb,
the embedded agent takes the position of proximate object to the verb,
and the benefactive is postponed with a preposition (cf. footnote 3):

(28)

a. mùdzídzísí á-kà-nyór-ér-á mùkàdzí   'the teacher wrote for the woman'
    teacher he-pst-write-for woman

b. mùdzídzísí á-kà-nyór-és-á mùrómé   'the teacher made the man write'
    teacher he-pst-write-cause man

c. mùdzídzísí á-kà-nyór-ér-és-á   mùrómé yó mùkàdzí
    teacher he-pst-write-for-cause man 'for' woman
    'the teacher made the man write for the woman'

When (28a) and (28b) are combined in (28c), the embedded agent has pri-
ority to the first object position over the benefactive, and can

therefore be placed higher in the case hierarchy.[6]

The last step of this case hierarchy can be defined with reference
to the causative constructions in (29):

(29)

a. mùrúmé á-kà-chéká zánzè né bángá   'the man cut the fruit with a

   man he-pst-cut fruit with knife knife'

b. mùrúmé á-kà-chéká mwàná né bángá   'the man cut the child with a

   man he-pst-cut child with knife knife'

As seen in (30a), the instrumental né banga 'with a knife' can become
the subject of the passivized causative construction corresponding to
(29a):

(30)

a. bángá rá-kà-chék-és-w-à   zànzè né mùrúmé 'the knife was caused to

   knife it-pst-cut-cause-pass. fruit by man   cut the fruit by the man'

b. *bángá rá-kà-chék-és-w-à   mwàná né mùrúmé 'the knife was caused to

   knife it-pst-cut-cause-pass. child by man   cut the child by the man'

As seen in (30b), however, the instrumental cannot become the subject in
this construction if the underlying accusative is more animate than it.
What this means is that the instrumental and the accusative vie for sub-
ject position. The accusative has priority, especially if it is animate.
The total case hierarchy defined with reference to accessibility to the
subject slot is therefore as in (31):

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[6]Consistent with the observation that the embedded agent has priority
over the benefactive is the observation that the causative suffix follows
the applied suffix in verbs, e.g., nyór-ér-és-á 'cause to write for'.
It is interesting to note that a minimal pair exists where the suffixes
can be reversed. From kù-téngá 'to buy' we can form kù-téng-és-á
'to sell' (lit. to cause to buy). But we can now have kù-téng-ér-és-á
'to cause to buy for' (the expected order) or kù-téng-és-ér-á 'to sell
for'. The second is possible only because kù-téng-és-á is lexicalized.
Since the suffixes come in the reverse order, we expect that the hierarchy
will be affected by this, i.e., that the benefactive or 'to sell for' may
have priority over the object of 'cause' in deriving passive sentences.
Unfortunately we were not able to look into this problem in sufficient
detail.

(31) (1) Agent: subject agent in simple sentences; embedded agent in
         causative sentences

     (2) Benefactive ('on behalf of')

     (3) Dative ('to' of 'intended for')

     (4) Accusative

     (5) Instrumental

5. Natural Topic

In section 2 we established a hierarchy of animacy according to dis-
tinctions made in the gender classification of nouns in Shona and their
behavior in conjoined noun phrase constructions. Throughout the subse-
quent discussions, a few examples were used which showed that grammatical
strategies for case assignment could be dispensed with in instances where
the animacy status of the different nouns involved was sufficient to
allow the proper interpretation of the construction. Pronominalized con-
structions in particular give evidence for this kind of phenomena,
because the only semantic information provided by the noun class pronoun
forms is that concerning differences in animacy. Each noun class in Shona
carries a particular pronoun form; therefore, each pronoun form will be
associated with the semantic features of animacy which mark the items
in a given noun class:

(32)

a. mùrúmé á-kà-mú-nyór-ér-á   íyò   'he wrote it (the letter, cl.9)
    man he-pst-him-write-to/for it   to/for him (cl. 1)'

b. mùrúmé á-kà-yí-nyór-ér-á   íyè   'he wrote it (the letter, cl.9)
    man he-pst-it-write-to/for him   to/for him (cl. 1)'

Although (32a) represents the underlying benefactive mu 'to/for him'
and accusative iyo 'it' (cl. 9) pronouns in their expected grammatical
positions, when the pronouns are reversed, as in (32b), the same case
relations are maintained. What this suggests is a pragmatic strategy by
which the benefactive/dative cases are more likely to be filled by human
participants than the accusative case. Therefore, the sentence is inter-
preted unambiguously when the two object nouns or pronouns are of dif-
fering animacy (i.e., (3?b) should mean by the grammatical positioning

of the pronouns *'he wrote him for it', but it does not).

Such associations of particular cases with certain types of partici-
pants account for why the passivized sentences in (33) mean the same
thing:

(33)

   a. (mùkâdzí) á-kà-yí-nyór-ér-ẁ-á   '(the woman) for her it was
       woman she-pst-it-write-for-pass. written'

   b. (tsàmbà) yá-kà-mú-nyór-ér-ẁ-á   '(the letter) it was written
       letter it-pst-her-write-for-pass. for her'

Even if one object is animate rather than inanimate, the same variant
construction may occur if the selectional restrictions on the verb pro-
vide appropriate case relations:

(34)

   a. (ìmbwá) yá-kà-mú-róv-ér-ẁ-á   '(the dog) it was hit for her'
       dog it-pst-her-hit-for-pass.

   b. (mwàná) á-kà-yí-róv-ér-ẁ-á   '(the child) for her it was hit'
       child she-pst-it-hit-for-pass.

Similar results are obtained with pronominalized embedded agents and ac-
cusatives in causative constructions. The more animate participants are
assigned to the agentive case.

When both the benefactive and agentive cases are pronominalized, the
agentive case is still assigned the more animate being:

(35)

   a. (mùrúmé) á-kà-yí-róv-ér-és-w-à   mùtí
       man he-pst-it-hit-for-cause-pass. tree
      '(the man) he was caused to hit the tree for it (the dog)'

   b. (ìmbwá) yá-kà-mú-róv-ér-és-w-à   mùtí
       dog it-pst-him-cut-for-cause-pass. tree
      '(the dog) for it he was caused to hit the tree'

The problem with such sentences is self-evident: they are highly complex
and tax the limits of both the grammar and the mind. What is relevant is

that when appropriate situations can be defined, the more animate parti-
cipant is assigned to the agentive case. This hierarchy, which is de-
fined according to which cases have greater access to the more animate
nouns in a sentence, parallels that hierarchy given with respect to
grammatical accessibility to the subject slot in passive sentences (31).

Throughout this paper we have assumed that some semantic feature
specifying the animacy status of an object may influence the grammatical
realization of particular configurations of underlying cases. Although
considerations of animacy have been sufficient to adequately account for
the data up until this point, certain factors suggest that perhaps more
than just a preference for more animate things in certain case relations
may be involved. That the language assigns more animate beings to bene-
factive and agentive cases than to the accusative is not surprising,
since accusative objects are usually inanimate. However, that there
should be any distinction between benefactive and agentive cases, both
in the grammar and in associations with participants of more or less
animacy, is significant since both are typically human.

The topic of a sentence is that thing or person which is being talked
about. In that sense of the word it consists of "old information". What
people usually talk about are other people, and the phenomena which have
been described in this paper are understandable in terms of some notion
of the kind of things or types of events which people usually discuss
with one another. The benefactive case is higher on this hierarchy of
"natural topic" than the accusative because it is usually filled by human
beings and human beings are talked about more than inanimate things (cf.
Givón, forthcoming). That an agentive is higher on this hierarchy than
the benefactive is becuase agents are typically the initiators of events
and are therefore more directly involved in the action(s) which are being
described than the benefactive or dative.[7]

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[7]The basicness of the agentive over the benefactive case can be seen
from the observation (cf. Fillmore [1968]) that there can generally not
be a benefactive in a sentence lacking a "deep" agent. Thus, the sen-
tence 'I heard the music for him' seems odd.

The strongest support for this analysis is the fact that the human
category of the animacy hierarchy is further differentiated between first
and second person referents on the one hand, and third person human
referents on the other:

(36)

a. ǹdà-ká-mú-svfpúr-fr-ẁ-á   'he was kissed for me'
        I-pst-him-kiss-for-pass.

    á-kà-ǹdf-svfpúr-fr-ẁ-á   'he was kissed for me' (grammatically
    he-pst-me-kiss-for-pass.   should be *I was kissed for him)

b. wà-ká-mú-svfpúr-fr-ẁ-á   'he was kissed for you'
        you-pst-him-kiss-for-pass.

    á-kà-kú-svfpúr-fr-ẁ-á   'he was kissed for you' (grammatically
    he-pst-you-kiss-for-pass.   should be *you were kissed for him)

c. ǹdà-ká-kú-svfpúr-fr-ẁ-á   'you were kissed for me'
        I-pst-you-kiss-for-pass.

    wà-ká-ǹdf-svfpúr-fr-ẁ-á   'I was kissed for you'
        you-pst-me-kiss-for-pass.

In (36a, b) the first or second person pronoun is interpreted to be the
benefactive, whether it appears in subject position (where it belongs)
or in the prefixed object position. In (36c), on the other hand, where
a first and a second person pronoun is involved, the case relations are
assigned strictly according to grammatical position, showing that first
and second person pronouns are of equal "animacy". However, since all
of these pronouns represent human referents some criterion other than
animacy must be involved in the interpretation of these sentences.

We should like to propose that the notion of "natural topic" can
account for this differentiation among the personal pronouns. First
and second person pronouns are deictically defined in conversation,
e.g., they are defined according to who is speaking at a certain moment
in time (I) and to whom (you), while the third person referents are
understood by speakers to represent someone or something outside the
conversation, which remains constant in relation to it (cf. Benveniste

[1966]). That a language would differentiate third person pronouns from first and second person pronouns is not an inknown phenomenon; it has been observed elsewhere, e.g., in Tlahuitoltepec Mixe [Lyon 1967], in Algonkian (Jean-Pierre Beland, personal communication), and in French to some extent (cf. Hyman and Zimmer, in preparation). While Shona does not differentiate first and second person pronouns, other languages do. However, since both orders are found (e.g., first person pronouns precede second person pronouns in Italian, as pointed out to us by Francesco Antinucci, while the reverse is the case in Spanish; cf. Perlmutter [1970] for discussion), the only universal distinction appears to be between first and second person versus third person.[8] What is interesting is how these facts fit into a notion of natural topic in discourse. Sentences are normally constructed with reference to earlier utterances; similarly, discourse is constructed with reference to who is actively involved in the discussion. Therefore, it is understandable that first and second person referents would occupy the highest rung of the hierarchy of "natural topic".

6. Conclusion

In the preceding sections we have hierarchically defined related sets of phenomena acting in the construction and interpretation of acceptable sentences in Shona, as summarized in (37):

(37) (1) A grammatical hierarchy which assigns particular underlying case relationships to certain syntactic positions in the sentence

(2) A case hierarchy defined according to which case relations are more likely to be filled by certain items from a hierarchically related set of possible topics

(3) A hierarchy ranking nominals according to their specifications of more or less likely to be topic in a discourse, e.g., that which is being discussed

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[8] However, as pointed out to us by Bill Foley, this division is incomplete. A complete hierarchy would have to include the distinction between inclusive and exclusive as well as reflexive pronouns.

The final point to consider concerns what processes in the language pro-
vided the impetus for the grammatical strategies for the assignment of
elements in sentential constructions to be violated and reinterpreted
according to case-associated semantic features: (1) the redundancy it-
self which existed between the cases and the semantic features shared by
the elements usually found in those cases, or (2) some other influence
which is blocked except when distinctions of topic status among senten-
tial elements allow the proper assignment of underlying case relations
to these items without reference to grammatical predictions? Since the
grammatical hierarchy predicting accessibility to the subject slot in
Shona replicates exactly the case hierarchy defining which cases are
likely to carry "topic" (i.e. our former "animate") items, it seems un-
likely that the impetus for the change would come from within the system
itself. Topic is defined as "that which is being discussed" in the sense
of old information, and the unmarked position for topic in Shona, as in
many languages, is the subject slot in the sentence. That the grammati-
cal hierarchy correlates with the case hierarchy for topic rights shows
that the syntactic and semantic strategies of the language are organized
in complementary relation to one another. That is, they reinforce each
other.

   We therefore propose that pragmatic considerations involved in every-
day discourse have provided the impetus for the breakdown of grammatical
strategies in certain instances. While in Shona the unmarked position
for old information is the subject slot, marked topical information can
also be moved to the subject position before the verb. Marked topic is
to be understood as that element in a sentence which is being emphasized
or highlighted by a speaker; it is usually new information, although all
new information is not necessarily marked. The normal position for new
information in Shona is following the verb. However, for the purposes
of topicalization, the grammatical strategy can be broken. Thus, if the
underlying accusative is inanimate, it may be passivized into subject
(topic) position, violating the grammatical hierarchy by which benefac-
tives have priority over accusatives (cf. sentences (14) and (26) above).

As seen now in (38), this notion of natural topic also plays an important role in English:

(38)   I was sent a present
        a present was sent me

Although the first person singular pronoun and a present can change places, the same reading is obtained for both sentences. Even speakers of English who do not readily accept a present was sent me unambiguously interpret it as a present which I received and not as a present which received me. This is exactly parallel with the Shona constructions where a letter was being written (section 4). Note further the positonal change of the two noun objects in English, if both the accusative and dative are human, as in (39):

(39)   the man was sent the woman
        the woman was sent the man

It does appear, however, that an English sentence of the surface structure NP passive NP will be grammatically interpreted with the first NP as the underlying <u>dative</u>, although considerations of natural topic may play a role, as just seen in (38).

The process described earlier as topicalization is intimately associated with the process of distinguishing definite and indefinite referents in sentences. Definite referents are usually old information; indefinite referents are usually new information: I received a letter [new] today. The letter [old] came by special delivery. In Shona, there are two forces competing for sentence initial position: one associated with that position as the unmarked position for old information; the other associated with that position as the marked position for topicalized elements. In languages which have definite/indefinite distinctions these differences can be maintianed through the use of definite and indefinite articles even if the language has these same two tendencies fighting for a

particular position in the sentence:[9]

(40) I was sent <u>a letter</u>   cf. <u>A letter</u> was sent me
                    new   new

       I was sent <u>the letter</u>   cf. <u>The letter</u> was sent me
                    old   old

Shona has no such means to differentiate new and old information, since
there are no definite or indefinite markers. The fact that topicalized
information can push its way into the position normally reserved for old
"topical" information has provided the impetus to look elsewhere in the
system for a means of establishing "what is being talked about" without
reference to the actual occupant in the subject slot of the verb.

    In the process of constructing an utterance three factors come into
play, as seen in (41):

(41) Grammatical strategy : where does a given noun belong in the
                                sentences (i.e. its position vis-à-vis
                                the syntax)

       Semantic strategy   : what level in the natural topic hierarchy
                                does the noun occupy by virtue of its
                                intrinsic semantic properties

       Pragmatic strategy   : what is being discussed/topicalized in
                                the discourse at any given moment

Evidence that there is a separate grammatical or syntactic strategy is
seen from the fact that our informant sometimes disregarded the natural
topic hierarchies and interpreted sentences solely on the basis of the

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[9]In English, definite and indefinite articles play much more of a
role than can possibly be discussed in this paper. Thus, although the
following sentence means that the child received a present,

            a present was sent the child

the sentence

            the present was sent a child

is interpreted as a child being sent to the present. In other words, the
fact that the child is human and a present inanimate is sufficient
to allow the underlying accusative to be in the first NP position of this
NP passive NP construction. However, when the articles are switched, as
in the second sentence, the animacy differential is not sufficient.

syntax. What is crucial is that on any given occasion, when faced with the problem of interpreting sentences, Dr. Marasha was <u>consistent</u> in choosing a strategy--i.e. he did not randomly wander from one to the other. Throughout this paper we have focused on the first strategy. Thus, sentences such as those in (42)

(42)

a. á-kà-bík-ìr-à mùkâdzí sàdzà   'he cooked (the) porridge for the
    he-pst-cook-for woman porridge   woman'

b. á-kà-bík-ìr-à   sàdzà mùkâdzí
    he-pst-cook-for porridge woman

were said to be synonymous. However, when following a strictly syntactic strategy, our informant insisted that (42b) should be interpreted as 'he cooked the woman on behalf of the porridge', and similarly for other sentences where an inanimate underlying accusative has come to be the proximate object of a prepositionally derived verb. Since different interpretations were consistently given on different days, we may conclude that the informant has access to two different strategies.

    A second piece of evidence for recognizing two separate strategies is seen from certain ambiguities which result when both strategies break down. As can be seen from the following two sentences (cf. the examples in (10)),

(43)

a. á-kà-svípúr-ír-à mùkâdzí mwàná   'he kissed the child for the woman'
    he-pst-kiss-for   woman child

b. á-kà-svípúr-ír-à mwàná mùkâdzí   'he kissed the woman for the child'
    he-pst-kiss-for   child woman

when two object nouns are of equal status in the natural topic hierarchy, the syntactic strategy identifies the first noun as the underlying bene- factive. In this particular case, the semantic strategy has broken down, since the benefactive cannot be differentiated from the accusative solely on the basis of the inherent properties of the nouns involved.

On the other hand, the syntactic strategy breaks down when one of the objects is a noun and the other a pronoun. As seen in the two sentences in (44), where mu is the class 1 human pronoun, and yí the class 9 animal pronoun,

(44)

 a. á-kà-mú-svípúr-ír-à ìmbwá   'he kissed the dog for him'
     he-pst-him-kiss-for   dog

 b. á-kà-yí-svípúr-ír-à mwàná   'he kissed it for the child'
     he-pst-it-kiss-for   child

a human noun or pronoun will claim the benefactive reading over an animal noun or pronoun. Since there are two noun slots after the verb, it is possible to determine which of the two nouns is the proximate object by its adjacency with the preceding verb. There is, however, only one pronoun object slot directly preceding the verb stem, which, note, either an underlying benefactive or accusative has access to. Thus, in sentences with both a pronoun and a noun object, as in (44), either of these can be potentially interpreted as the proximate object. It is impossible to determine syntactically whether this pronoun is a benefactive (44a) or accusative (44b). Interpretation must therefore be done semantically, i.e. by assigning the more "animate" object to a case which is higher in the hierarchy. Thus, in (44), both 'it' and 'dog' are assigned to the accusative, while 'him' and 'child' are assigned to the benefactive.

Finally, note that in (45), where the noun and pronoun are equally animate and human,

(45) á-kà-mú-svípúr-ír-à mwàná   'he kissed him for the child'
      he-pst-him-kiss-for child   'he kissed the child for him'

both the semantic and the syntactic strategies break down, and the result is that (45) is ambiguous between the two interpretations indicated. This is exactly the prediction made in an approach distinguishing the two strategies.

There is of course a third strategy, since we have seen that in the assignment of a syntactic position to a given noun, the potential

topicality of its case relation plays a key role. However, in actual discourse, a noun whose case is lower on the natural topic hierarchy (e.g., accusative as compared to benefactive) can come to occupy a higher position (e.g., subject) by means of topicalization. In conclusion, we need only note that such phenomena as have been described in this paper represent the means by which semantic and pragmatic considerations undermine the absolutive power of a grammar. We might also add that in Shona the scales seem to be tipped in favor of the former, since people are the ones who possess the presuppositions about meaning and control the pragmatics of discourse, and they are still doing the talking...[10]

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[10] An earlier version of this paper was presented at the Fourth Annual California Linguistics Association Conference, May 4-5, 1974, University of Southern California. At that meeting, Robert Kirsner pointed out that there are a number of parallels between the Shona data and other languages, in particular, Dutch and Navajo (see Kirsner [1973]). While the "animacy" hierarchy has been noticed in many languages (i.e. 1st/2nd, human-3rd, animal-3rd, inanimate-3rd), the Shona data are particularly instructive in revealing the corresponding case hierarchy. The two hierarchies conspire together to bring into greater "focus" those elements which are higher on each scale. The animacy hierarchy is called one of agentivity by Kirsner, and one of "efficacy" by Matisoff [1973], who notes similar findings in Lahu. Finally, Boyd Michaelovsky has pointed out parallels in Hayu, a language of Nepal. Facts from English, French and Italian suggest that there is another related topic hierarchy, which ranks nouns on the basis of definiteness or specificity (cf. Hyman and Zimmer, in preparation). It thus appears that on the specificity scale, 'the cop' is higher than 'the cops' which is higher than 'all of the cops' which is higher than 'some cops'. In conclusion, then, there are at least four strategies for communicating (and decoding) topical information: 1) word order (topical information comes earlier), 2) case, 3) animacy ("agency" or "efficacy"), and 4) specificity.

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PRONOUNS AND ISLANDS IN YORUBA[1]

Herbert Stahlke
Department of Linguistics
University of Illinois

1. Introduction

This paper considers the behavior of certain Yoruba deletion and
pronominalization phenomena with respect to island constraints. In
order to approach several of the problems, it will be necessary first
to reanalyze some related areas of Yoruba syntax, including subject-
verb agreement and relative clause formation. I will argue that the
dependent subject pronouns are, in fact, prefixes, and that they arise
by a subject-verb agreement rule. I will then show that relativization
in Yoruba involves certain types of reduction under coreference which
are controlled in part by island phenomena. I will then illustrate the
behavior of island constraints, and I will argue that a distinction must
be made between those constraints which require the mention of some S
node in their statement and those that do not and that constraints of
the former type are stronger in an easily specifiable way.

2. Yoruba Pronoun Forms

Yoruba has several sets of subject pronoun forms whose distribution
is conditioned morphologically.[2] The pronouns are as follows:

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[2]There is some debate as to just how the dependent pronouns are re-
lated to the independent forms. The strongest position, adopted by
Stahlke [1969] is that they are synchronically derived from the inde-
pendent forms by regular morphophonemic processes. This position is
modified somewhat in Fresco [1971], where he shows that the second per-
son singular o cannot be derived by vowel harmony, as I had suggested,
since Standard Yoruba vowel harmony operates only on the tense vowels
o and e, laxing them to ọ and ẹ. Thus the normal harmonic process
could not account for the shift from ìwọ to o , a shift from lax to
tense. At least in this case the strong position I had originally
adopted must be modified.

(1) Yoruba subject pronoun paradigms

   (a) Independent pronouns

èmi	'I'	àwa	'we'
ìwọ	'you (sg.)'	èyin	'you (pl.)'
òun	'he, she, it'	àwọn	'they'

   (b) Dependent pronouns

      i. Preterit   ii. Negative and Future (yó')

mo	a		mi	a
o	ẹ		o	ẹ
ó	wọ́n		∅	wọn

    iii. Progressive   iv. Future (á)

mò	à		mà	à
ò	ẹ̀		wà	ẹ̀
ó	wọ́n		á	wọ́n

The subject forms of the first and second plural appear to be derived from the initial vowel of the independent forms. The other plural pronouns differ, if at all, only in tone from the independent root. I will offer below an explanation for the high tone found on some of the third plural subjective pronouns. Although the singular dependent forms deviate considerably from their corresponding independent pronouns, I will discuss only the third person morphemes and, to a very limited degree, the first person. For an analysis of the second person singular subject pronoun, see Fresco [1971] and Stahlke [1969].

In developing an analysis of the third person singular subject pronoun, the following facts must be accounted for.

(2)   i. All singular preterit and progressive pronouns end in the vowel o.

      ii. All third person singular and plural forms except in the negative and future (yó') paradigm bear a high tone.

     iii. The third singular is segmentally zero in the negative and future (yó').

Since two sets of singular subject pronouns end in o , and no plu-
rals or pronouns from other paradigms do, the morphological status of
this vowel as a part of the pronominal system must be considered.
Several facts suggest that it is not actually a part of the pronoun
system. For example, the phonology of Standard Yoruba places the con-
dition on CV sequences that nasals be followed by one of the three
nasalized vowels ĩ , ũ , and ã , not by an oral vowel. Thus the form
mo is a morpheme structure violation and might be considered poly-
morphemic. The distribution of the vowel o in other tenses lends
support to the hypothesis that this vowel does not belong to the pro-
nominal system and that mo consists of mi + o. As the affirmative
and negative preterit and future (yó') forms below illustrate, the
vowel o occurs consistently before the verb, and its distribution is
easier to state in terms the verbal elements of the verbal string
than in terms of the pronominal and tense/aspect markers.[3] Thus it is
not to be considered a part of the subject pronoun. The o under dis-
cussion is underlined in the following examples.[4]

(3) i. Preterit affirmative

   m<u>o</u> lǫ ilé   'I went home.'

   <u>o</u> lǫ ilé   'You went home.'

   <u>ó</u> lǫ ilé   'He went home.'

 ii. Preterit negative

   mi (k)<u>ò</u> lǫ ilé   'I didn't go home.'

   o <u>ò</u> lǫ ilé   'You didn't go home.'

   ∅ k<u>ò</u> lǫ ilé   'He didn't go home.'

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[3]The situation is not quite this simple. Bamgboṣe [1966] and
Awobuluyi [1967a] give a long list of modals and other aspectual and
adverbial elements which can occur between the vowel o and the main
verb. However, none of these will cause o to come before the negative
or future morphemes, and so my distributional claim stands, subject to
the modification that the element immediately to the right of o re-
quires further specification.

[4]See note 2 for a discussion of the o found in the second person
singular.

iii. Future affirmative

    mi (y)ó' lǫ ilé   'I will go home.'

    o   ó' lǫ ilé   'You will go home.'

    ∅   yó' lǫ ilé   'He will go home.'

iv. Future negative

    mi kì yó' lǫ ilé   'I won't go home.'

    o kì yó' lǫ ilé   'You won't go home.'

    ∅ kì yó' lǫ ilé   'He won't go home.'

Fresco [1971] agrees that the o found in the preterit subject pro-
noun series is not morphologically a part of the pronoun. However, he
argues that lexically the third singular pronoun consists of the high
tone which remains after the vowel has been removed. His analysis fails
to account for an important fact about this high tone, namely, the dis-
tribution of the high tone which he **identifies** as the pronoun. The fol-
lowing examples will illustrate this.

(4)   i.   ó lǫ   'He went.'

          kò lǫ   'He didn't go.'

          yó' lǫ   'He will go.'

  ii. wón lǫ   'They went.'

         wǫn kò lǫ   'They didn't go.'

        wǫn yó' lǫ   'They will go.'

 iii. ǫmó lǫ   'The child went.'

        ǫmǫ kò lǫ   'The child didn't go.'

        ǫmǫ yó' lǫ   'The child will go.'

Since the third singular subject pronoun is, as generally recognized,
zero before the negative of future (4i), the high tone of ó will also

be absent in just those places.[5] This pattern is paralleled in the
third person plural subject pronoun (4ii). This pronoun has a high tone
in the preterit affirmative, but a mid tone in the negative and future.
The mid tone form is probably basic, since all other forms of this pro-
noun, with the exception of object pronouns occurring after low or mid
tone verbs, have mid tone. Thus the high tone in the third plural form
has the same distribution as in the third singular. The examples in
(4iii) represent a large class of sentences in which the subject is an
NP containing at least a noun and possibly more. The final vowel of the
subject NP has a high tone, regardless of what its basic tone may be,
just if the following morpheme is not the negative or the future marker.
As the examples in (4) show, the high tone which appears in the third
person preterit forms is independently predictable and thus is not to
be interpreted as the third person singular morpheme. Thus the third
person singular form of the subject pronoun must be considered morpho-
logically zero, not only in the negative and future, where this conclu-
sion is obvious, but also in those paradigms in which the vowel o and
a high tone are found.[6]

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[5]The morphology of the Yoruba tense/aspect system is at least as com-
plex as that of the pronoun system, and any attempt at synchronic regu-
larization is probably doomed from the outset. But even given this
hedge, it may be possible to analyze the future marker yó' in the fol-
lowing. Since short falling tones, or high-low sequences on single
vowels, are very rare in Yoruba, yó' may lend itself to an anaylsis
as í + ò. The vowel í may be identical to the í of the habitual
and future negator kíí , and the negative future form kí yó' may be
analyzable as /kíí ò Verb/, becoming /kí yó' Verb/, with only the
downstep remaining from the low tone. Whether the high tone of the í
of kíí and yó' is identifiable as the same high tone elsewhere used
as a subject marker is doubtful.

[6]Talmy Givón (personal communication) has suggested the possibility
that the o and the high tone are alternants of an agreement morpheme.
I agree that this is probably the diachronic source of both formatives,
but there are several problems involved in trying to make this a syn-
chronic analysis as well. One of these is the fact that the o occurs
throughout the singular subject series but not at all in the plural.
As mentioned in the body of the paper, o cannot simply mark the sin-
gular, since it is found also in the place of plural subjects which
have been put in focus. The high tone also occurs in places where

The claim that the subject concord (SC) prefix, the negative marker, and certain tense/aspect markers are morphologically prefixes on the verb is further supported by vowel harmony alternations in some dialects [Bamgboṣe 1967, Awobuluyi 1967b, Adetugbo 1967, and Fresco 1971].

3. Some Agreement and Coreference Problems

The analysis of the third person pronoun just presented plays an important role in the interpretation of certain syntactic phenomena in Yoruba, including focus and the identification of coreferential NP's in complex sentences. Several linguists [Courtenay 1969, Fresco 1971, Schachter 1971, and Stahlke 1969] have claimed that Yoruba, like many other Niger-Congo languages, has a subject-verb agreement or concord rule. This rule attaches a subject concord marker (SC) as the left most constituent of the verb. Thus a surface structure like mo lọ 'I went' is derived from a deeper structure èmi lọ in which the subject NP is an independent pronoun.[7] This rule is illustrated below.

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agreement seems like a less likely analysis. For example, in sentences which undergo Equi-NP-Deletion there will always be a high tone before the verb of the embedded sentence, as discussed in section 3. That this high tone is not an agreement morpheme is clear from the fact that it does not occur in some of the kí complements where one would expect it to. Thus sentences (a) and (b) have desiderative counterparts without the high tone.

(a) Dàda ∅́ máa lọ   kí Dàda máa lọ

     Dàda will go   that Dàda   go

(b) Wọ́n lọ ilé   kí wọn lọ ilé

     They went home.   that they go home

Finally, if either o or ∅ , or both, are grammatical agreement markers, their very occurrence, not merely their distribution, would have to be conditioned morphologically, as the data in the first section of the paper show. This is a most unnatural condition on a syntactic process.

[7] I am assuming that the derived structure resulting from concord is a Chomsky-adjunction. There is really very little evidence for this claim, but its validity has no effect on the arguments in this paper.

(5) i.

'I went.'

ii.
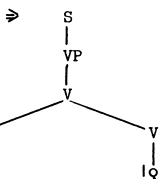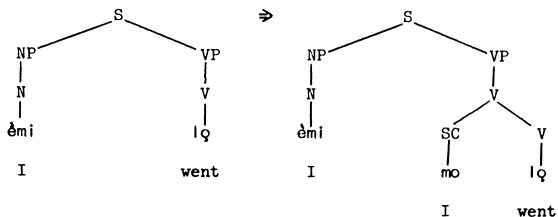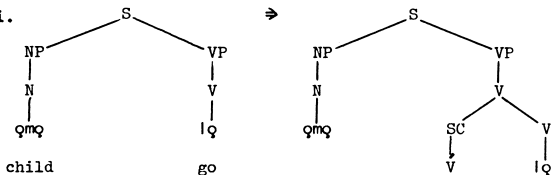
ǫmǫ́ lǫ   'The child went.'

If the subject NP is a personal pronoun, as in (5i), the appropriate SC is attached to the verb and the subject is deleted. If, as in (5ii), the subject NP is a noun, the SC is simply the high tone whose distribution was illustrated in (4). In this case, the subject NP is not deleted.

Focus sentences in Yoruba involve placement of the focused NP at the

front, subject generally to island constraints.[8] The focused NP is
followed by the thematic particle ni , as below.

(6)   Ajá kpa adîę   ⇒   Adîę ni ajá kpa
       dog kill chichen   chicken Topic dog kill
       The dog killed the chicken.   It's the chicken the dog killed.

If it is the subject NP which is to be focused, it too is moved to the
front. In the preterit affirmative, however, the particle ó is inser-
ted in subject position. In the negative and future ó is not inserted.
This is illustrated in (7).

(7)   i.   Ajá kpa adîę
            dog kill chicken
            The dog killed the chicken.
                    ⇒ Ajá ni ó kpa adîę
                      dog Topic kill chicken
                      It's the dog that killed the chicken.

       ii. Ajá kò kpa adîę
            dog neg kill chicken
            The dog didn't kill the chicken.
                    ⇒ Ajá ni kò kpa adîę
                      dog Topic neg kill chicken
                      It's the dog that didn't kill the chicken.

       iii. Ajá yó'kpa adîę
            dog future kill chicken
            The dog will kill the chicken.
                    ⇒ Ajá ni yó'kpa adîę
                      dog Topic future kill chicken
                      It's the dog that will kill the chicken.

_____

[8] Ajólore [1974] presents a compelling array of arguments for deriving
focus sentences in a manner similar to the derivation of pseudo-clefts in
English [Akmajian 1971]. This involves the reduction of the relative
clause in the pseudo-cleft to just the constituent in focus, deleting
all trappings of the relative clause. While I disagree with certain
details of Ajólore's analysis, the overall structure of it is convincing.

That this replacement by ó is not an agreement process is illustrated
by the following examples.

(8)   i.   èmi ni ó lọ   'It's I that went.'
           èmi ni mo lọ

      ii. ìwọ ni ó lọ   'It's you (sg.) that went.'
           ìwọ ni o lọ

      iii. àwa ni ó lọ   'It's we that went.'
           àwa ni a lọ
           *àwa ni wọ́n lọ

      iv. ẹ̀yin ni ó lọ   'It's you (pl.) that went.'
           ẹ̀yin ni ẹ lọ
           *ẹ̀yin ni wọ́n lọ

      v.   àwọn ni ó lọ   'It's they that went.'
           àwọn ni wọ́n lọ

In each example, the first member of the pair has ó replacing the
focused pronoun, and the second has the corresponding subject pronoun as
a replacive. Thus agreement in focus must be considered optional. The
examples with agreement are also considered slightly more emphatic than
those with ó. The third example in (8iii) and (8iv) is given to show
that ó does not mark number agreement, since the plural examples are
ungrammatical with just number agreement and no person agreement. This
is further evidence, in this case of a syntactic sort, that ó is not a
third person singular subject pronoun. If it were, then it would be
necessary to claim that the third singular can agree with any other per-
son/number combination, a claim which receives no support from any other
area of Yoruba syntax. The agreement phenomenon sketched in (51) in-
volves two rules. First, there is a rule of Subject Concord, which
copies the appropriate concord morpheme onto the verb, and then there
is a rule of Pronominal Subject NP Deletion, which deletes the Subject
NP just in case it is a pronoun.

    Yoruba also has a rule of Equi-NP Deletion which applies in certain
complement structures. The sort of complement involved here has been

the subject of considerable recent discussion [Bamgboṣe 1971 and Awobuluyi 1970]. I will illustrate it with the following paradigm, using the desiderative verb fẹ́ 'want'. Complements of desiderative verbs are introduced by the complementizer kí.

(9)   i. mo fẹ́ kí èmi lọ   'I want that I go.'
      ii. mo fẹ́ kí n lọ   'I want that I go.'
      iii. mo fẹ́ẹ́ lọ   'I want to go.'

(10) i. o fẹ́ kí ìwọ lọ   'You (sg.) want that you (sg.) go.'
      ii. *o fẹ́ kí o lọ   'You (sg.) want that you (sg.) go.'
      iii. o fẹ́ẹ́ lọ   'You (sg.) want to go.'

(11) i. ó fẹ́ kí òun lọ   'He$_i$ wants that he$_i$ go.'
      ii. ó fẹ́ kí ó lọ   'He$_i$ wants that he$_j$ go.'
      iii. ó fẹ́ẹ́ lọ   'He wants to go.'

(12) i. a fẹ́ kí àwa lọ   'We want that we go.'
      ii. *a fẹ́ kí a lọ   'We want that we go.'
      iii. a fẹ́ẹ́ lọ   'We want to go.'

(13) i. ẹ fẹ́ kí èyin lọ   'You (pl.) want that you (pl.) go.'
      ii. *ẹ fẹ́ kí ẹ lọ   'You (pl.) want that you (pl.) go.'
      iii. ẹ fẹ́ẹ́ lọ   'You (pl.) want to go.'

(14) i. wọ́n fẹ́ kí àwọn lọ   'They$_i$ want that they$_i$ go.'
      ii. wọ́n fẹ́ kí wọn lọ   'They$_i$ want that they$_j$ go.'
      iii. wọ́n fẹ́ẹ́ lọ   'They want to go.'

In each of the examples (9-14) there are three sentences, all six sets being paradigmatically identical. In each case, sentence (i), containing an independent pronoun in the the lower sentence, is more emphatic and explicit than sentence (iii), in which Equi-NP Deletion has applied. In examples (10, 12, 13), sentence (ii) is ungrammatical, but in (9), where the o is missing, it is grammatical.[9] In (11ii) and (14ii), on

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[9]The absence of o in (9ii) is a further piece of evidence that it is not an agreement marker. What (9ii) does suggest is that o may have something to do with modality.

the other hand, the dependent pronoun in the lower sentence indicates that the higher and lower subjects are not coreferential.[10] In paradigms like (9-14) but with non-coreferential higher and lower subjects, analogs to the (i) and (ii) sentences are found. Sentences like (iii) are naturally not possible since Equi-NP Deletion requires coreference. In such sentences, the difference between dependent and independent pronouns in the complement is one of emphasis.

In complements of declarative verbs the behavior of embedded subjects under coreference is identical to what was found in (9-14), with the exception that declarative verbs do not permit Equi-NP Deletion. I will illustrate only the third person cases.

(15) i. ó sọ kpẹ́ òún lọ   'He$_i$ said that he$_i$ went.'
    ii. ó sọ kpẹ́ ó lọ   'He$_i$ said that he$_j$ went.'

(16) i. wọ́n sọ kpẹ́ àwọ́n lọ   'They$_i$ said that they$_i$ went.'
    ii. wọ́n sọ kpẹ́ wọ́n lọ   'They$_i$ said that they$_j$ went.'

In the third person the subject deletion rule, which normally applies after agreement, fails to apply, or, perhaps more accurately, is blocked from applying by the fact of coreference with the higher subject. In Yoruba, then, the absence of a subject NP may be due to at least two rules. After agreement has applied, subject NP deletion may apply just if the subject NP is a pronoun. In a desiderative complement structure Equi-NP Deletion removes the subject NP under the condition of coreference with the higher subject NP.

4. The Relative Clause

In Yoruba, as in English, the relative clause follows the head noun. The clause is introduced by the invariant marker tí , as in the following examples. The relative clauses are underlined.

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[10]The coreference alternation in the third person is a common phenomena in the Kwa languages. It was first observed in Idoma by R. C. Abraham [1953] and has since been discussed by Pike [1967]. I am grateful to Olúṣọlá Ajọ́lọre for pointing out to me that it holds in the plural as well as in the singular in Yoruba.

(17)   i.   ǫmǫ tʃ mo rʃ lǫ sʃ ilé

child Rel I saw went to house

The child <u>whom I saw</u> went home.

   ii.   ǫmǫ tʃ ó rʃ mi lǫ sʃ ilé

child Rel SC saw me went to house

The child <u>who saw me</u> went home.

   iii.   ǫmǫ tʃ mo rʃ ìwé⁻rè lǫ sʃ ilé

child Rel I saw book his went to house

The child <u>whose book I saw</u> went home.

In (17i) the relativized NP is the underlying object of the embedded S
and is absent in the surface structure. In (17ii) the relativized NP is
the underlying subject of the embedded S and again is absent in the
surface structure. In (17iii) the relativized NP is a possessive in the
underlying structure, and in the surface structure it is retained as a
pronoun. I will posit an underlying NP + S analysis, assigning under-
lying phrase structure trees like the following.

(18)

[S child [S I   saw   child S]   went   to   house S]
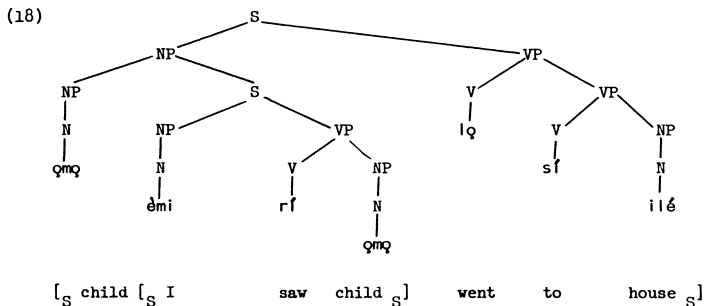
(19)   i. tí-Insertion
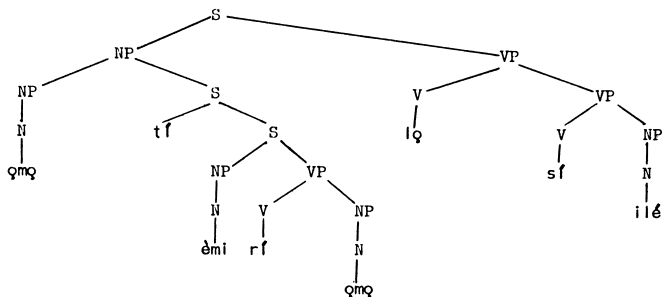
ii. Coreferential NP Reduction
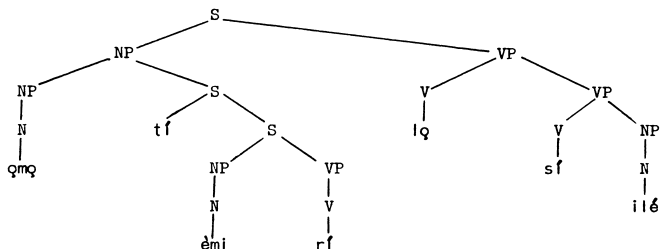
The relative marker is attached to the embedded S, and then the lower NP is subject to one of two types of reduction under coreference. One of the simpler cases is (18), the derivation of which is shown in (19). The deletion found in (19) is also found where the embedded coreferent is subject of the relative clause. Since, as I have shown in section One, the ó which has usually been treated as a third person singular pronoun is in fact not a pronoun at all, and the pronoun itself is null, in the relative clause in (20) it must be the case that the subject has been deleted just as was the object in (19).

(20)   ọmọ tí ó rí mí lọ sí ilé
         child Rel SC see me go to house
         The child who saw me went home.

However, Yoruba relative clauses cannot all be described as simply
involving deletion, like in (19) and (20). As the sentences in (21)
show, the embedded coreferent may, depending on conditions to be dis-
cussed below, also be pronominalized. In certain cases there is no way
to make the sentences grammatical because the relative clause is itself
ill-formed.

(21)   i. Adé wà ní ọdọ̀-ọmọ tí mo rí ìwé-rẹ̀
            Ade is in presence of child$_i$ Rel I saw book his$_i$
            Ade is with the child whose book I saw.

        ii. ọmọ tí òun àti Adé lọ sí ìgboro ni àbúrò-Mosún
            child$_i$ Rel he$_i$ and Ade went to town is junior-sibling of Mosun
            *The child who and Ade went to town is Mosun's junior-sibling.

       iii. *ajá tí oúnjẹ tí wọ́n fi fún un kò dárá tí kú
            dog$_i$ Rel food Rel they take give it$_i$ Neg good Perf die
            *The dog that the food that they gave it was not good has died.

        iv. *obìnrin tí kpé ó se oúnjẹ fún Adé wù mí ni ìyàwó'mi
            woman Rel that SC cook food give Ade please me is wife my
            *The woman$_i$ who that she$_i$ cooked for Ade pleased me is my wife.

The Yoruba sentences in (21i and ii) are grammatical, while those in
(21iii and iv) are not. In the corresponding English sentences only
(21i) is grammatical. Clearly, in the light of (21) it cannot be
claimed simply that Yoruba relative clauses involve the deletion of the
embedded coreferent.[11]   Rather, deletion occurs if the embedded

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[11]In an earlier draft of this paper I did in fact refer to this as the
deletion analysis of Yoruba relative clauses, implying that deletion was
the process which characterized the structure. The fact that this was
not correct was eventually brought home to me by persistent disagreement
from Olúṣọlá Àjọ́lore, as well as by comments from Talmy Givón. I am
grateful to both of them for forcing me to reconsider this point and
finally see the light.

coreferent is a subject, object, or adverb (22).

(22) i. ní ìgbà tí mo lọ ...

at time Rel I went

when/at the time at which I went

ii. ní ibi tí mo lọ ...

at place Rel I went

where/the place to which I went

Under certain other conditions the embedded coreferent may be pronomi-
nalized (21i and ii), and under still other conditions no relative clause
is possible (21iii and iv). What is apparently the case is that relati-
vization in Yoruba involves not simply deletion, but rather reduction
under conditions of coreference. Whether the NP is reduced to a pro-
noun or to zero, that is, is deleted, depends on conditions to be des-
cribed below.

5. Constraints on Movement and Anaphora

In the first section of this paper I developed an analysis of the
pronominal subject system of Yoruba. Some features of this system, such
as the zero form of the third person singular subject concord and the
conditions under which the agreement rules are blocked, play an important
role in an understanding of deletion, pronominalization, and restrictions
on these processes in Yoruba. In the second section I outlined the pro-
cesses involved in the formation of relative clauses in Yoruba, showing
that both deletion and pronominalization are involved. In this section
I will discuss the applicability of island constraints [Ross 1967] in
Yoruba and some modifications of the theory of constraints which can be
motivated on the basis of Yoruba. I will begin by briefly outlining the
island constraints as they were originally developed for English.

5.1. Ross' constraints on movement over variables. In his very impor-
tant study Constraints on Variables in Syntax [1967], Ross motivates a
set of constraints on rules which move NP over an essential variable.
One of these, the Coordinate Structure Constraint, blocks the movement

of NP out of a pair of structures conjoined by <u>and</u>, <u>but</u>, and <u>or</u>.[12] Con-
sequently the sentences in (23i) are fully grammatical, but those in
(23ii) are ungrammatical.

(23)   i. What did you eat with your wild rice?
           This is the roast duck which I ate with the wild rice.

       ii. *What did you eat roast duck and ?
           *Here is the typewriter which Will writes plays and I had
            repaired yesterday.

A grammatical sentence will result if, as in (24) the same NP is moved
out of both conjuncts.

(24)   Tom caught the fish which Sam cleaned and we all ate.

The constraint, as Ross states it [1967:161], is as follows.

(25)   <u>The Coordinate Structure Constraint</u>
       In a coordinate structure, no conjunct may be moved, nor
       may any element contained in a conjunct be moved out of
       that conjunct.

   Another of these constraints is one which blocks movement of elements
out of certain embedded sentences. Thus the sentences in (26i) are gram-
matical while those in (26ii) are not.

(26)   i. The man whom the prosecutor charged
           $[_{NP}$ $[_S$ that the defendant had murdered $_S]$ $_{NP}]$ turned up alive.
           Who does the book say $[_{NP}$ $[_S$ the steam engine was invented
           by $_S]$ $_{NP}]$?

       ii. *The man whom the prosecutor filed $[_{NP}$ $[_N$ the charge $_N]$ $[_S$ that
           the defendant had murdered $_S]$ $_{NP}]$ turned up alive.

           *Who do you know $[_{NP}$ $[_{NP}$ a man $_{NP}]$ $[_S$ who hates $_S]$ $_{NP}]$?

---

[12]The behavior of coordinate structures under movement rules varies
slightly, depending on which of the conjunctions is involved. I will
not discuss this point here.

Ross gives the following statement of this constraint [1967:127].

(27) The Complex NP Constraint

No element contained in a sentence dominated by a noun
phrase with a lexical head noun may be moved out of that
noun phrase by a transformation.

He gives the following diagram for (27) [1967:127], where A stands for
any constituent.

(28)
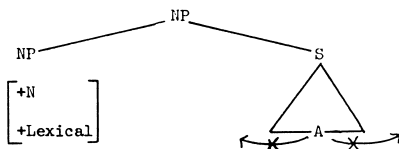
A third general principle governing movement rules is what he calls
the 'Pied Piping Convention', stated as follows [1967:206].

(29) The Pied Piping Convention

Any transformation which is stated in such a way as to
effect the reordering of some specified node NP, where
this node is preceded and followed by variables in the
structure index of the rule, may apply to this NP or to
any non-coordinate NP which dominates it, as long as
there are no occurrences of any coordinate node, nor of
the node S, on the branch connecting the higher node
and the specified node.

An example of the Pied Piping Convention is the following [Ross 1967:
197-8]:

(30) i.

```
                 S
          ┌──────┴──────┐
         NP            VP
          │        ┌────┴────┐
  the govern-      V        NP₁
      ment         │      ┌──┴──┐
               prescribes NP   NP₂
                          │   ┌──┴──┐
                    the height P   NP₃
                              │   ┌──┴──┐
                             of  NP   NP₄
                                  │   ┌──┴──┐
                            the lettering P  NP₅
                                         │  ┌──┴──┐
                                        on  NP   NP₆
                                            │   ┌──┴──┐
                                      the covers P   NP₇
                                                │    │
                                               of  reports
```
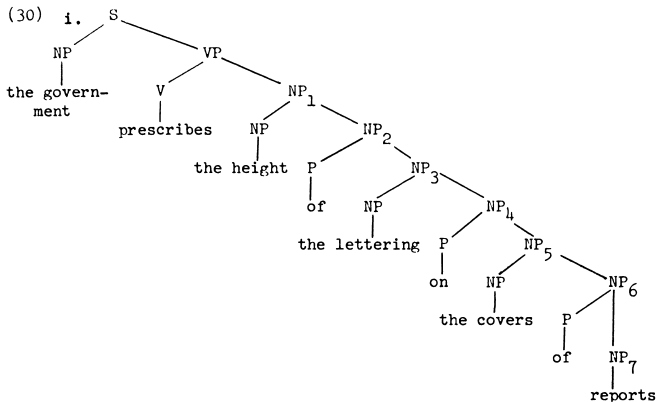
ii. The reports [$_{NP_7}$ which $_{NP_7}$] the government prescribes the height of the lettering on the covers of are invariably boring.

The reports [$_{NP_5}$ the covers of which $_{NP_5}$] the government pre-scribes the height of the lettering on almost always put me to sleep.

The reports [$_{NP_3}$ the lettering on the covers of which $_{NP_3}$] the public funds.

The reports [$_{NP_1}$ the height of the lettering on the covers of which $_{NP_1}$] the government prescribes should be abolished.

The Pied Piping Convention makes the movement of higher NP optional. Ross also observes that under certain conditions Pied Piping becomes obligatory. One of these conditions he states in the following way [1967:207].

(31) <u>The Left Branch Condition</u>

No NP which is the leftmost constituent of a larger NP can be reordered out of this NP by a transformational rule.

he gives the following examples [1967:200] to illustrate (31).

(32) i.
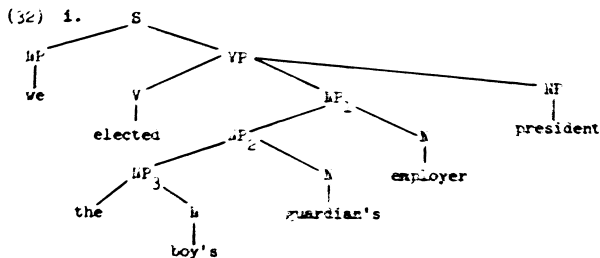
ii. (a) The boy [_NP_1 whose guardian's employer _NP_1] we elected
president ratted on us.

(b) *The boy [_NP_2 whose guardian's _NP_2] we elected employer
president ratted on us.

(c) *The boy [_NP_3 whose _NP_3] we elected guardian's employer
president ratted on us.

Another constraint is proposed to account for the ungrammaticality
of sentences like (33), in which some element has been moved out of a
sentence embedded in subject position.

(33)   i. For Harry to buy the big car was foolish.

       ii. *[_NP_ The big car [_S_ which [_S_ for Harry to buy _s_] was
       foolish _S_] _NP_] just rusted away.

This constraint Ross states as follows [1967:243].

(34)   The Sentential Subject Constraint
       No element dominated by an S may be moved out of that S
       if that node S is immediately dominated by an NP which
       itself is immediately dominated by S.

An important feature of sentential subjects is the fact that they can
usually be extraposed. Thus the sentence in (33) can be converted into
the sentence in (35i). Since the clause [_S_ for Harry to buy the big

car $_S$] is no longer a sentential subject, relativization as in (35ii)
renders the grammatical (35ii).

(35) i. It was foolish for Harry to buy the big car.
      ii. The big car which it was foolish for Harry to buy just
           rusted away.

    Ross claims that the Coordinate Structure Constraint and the Complex
NP Constraint are universal and that the Left Branch Condition and the
Sentential Subject Constraint are very nearly universal, violations oc-
curring in only a few languages and probably under carefully controlled
conditions.

5.2. <u>Island constraints in Yoruba</u>. The Coordinate Structure Constraint
is perhaps the easiest of the island constraints to illustrate in a par-
ticular language. Yoruba coordination is of two types, depending on the
constituents being conjoined. NP's are conjoined by àti , as shown
below.

(36) Adé àti Wálé ń saré
      Ade and Wale are running.

      Mo ra ilá àti èfó
      I bought okra and greens.

Sentences are conjoined by what is very likely a verbal element sì ,
meaning something like 'and then'. This word frequently has the effect
of imposing a temporal or logical order on the two conjuncts.

(37) Adé lo sì ojà, ó sì ra èfó
      Ade went to the market, he then bought greens.

Although it is questionable whether sì is in fact a conjunction, and
therefore whether conjoined sentences are permitted at all in Yoruba
surface structures, sentences like (37) seem to be subject to the Co-
ordinate Structure Constraint, as the in-focus example in (38) shows.

(38) i. èfó ni Adé rà
          greens TOPIC Ade bought
          It's greens Ade bought.

(38) ii. *ẹ̀fọ́ ni Adé lọ sí ọjà, ó sì rà

*It's greens Ade went to the market and then he bought.

Because of the questionable status of sí , I will concentrate only on conjoined NP's and the conjunction àti.[13]

Perhaps the most obvious movement rule in Yoruba is that involved in focus. As shown in (38), focus involves the preposing of the element to be focused and the insertion of the particle ni between it and the rest of the sentence. Focus is also involved in question formation, the question word being in focus. If the focused element is moved out of a coordinate structure, the sentence is ungrammatical, as in (39).

(39) i. *ìwọ ni mo rí àti Adé

*It's you I saw and Ade.

ii. *taani ọlọ́kpà àti rí òlè ní inú⁻ilé'mi

*Who did the policeman and see the thief in my house?

Sentences like those in (39) become marginally grammatical if the focused element is a noun, the third singular pronoun, or a question word, if it is the leftmost member of the conjoined structure, and if the pronoun òun 'he' is left behind. Even then, the sentence is grammatical only if the antecendent of òun is human. The following sentences meeting these conditions are marginally grammatical.[14]

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[13]The status of conjoined VP's in Yoruba is unclear. For some discussion of this question, see Stahlke [1970] where evidence is presented to show that because movement out of some serial verb contructions is permitted such constructions are probably not underlying coordinate structures but are more likely derived from complement structures.

[14]The situation is actually more complex than this. Although it seems that the condition on humanness of nouns is generally true, it is also the case that if these exists a particularly close semantic connection between a verb and an object, the first conjunct of the object can be pronominalized. An example of this is the sentence

iláᵢ ni mo ńse òunᵢ àti ẹ̀fọ́

okraᵢ Topic I am-cooking itᵢ and greens

in which ilá has been focused and the pronoun òun is left behind. If the verb se 'cook' is replaced by another verb, such as rà 'buy' or rí 'see', the sentence becomes ungrammatical. I owe this example to Ajólore.

(40) i. ?Adé ni mo rí òun àti àbúrò'mi

It's Ade that I saw him and my younger sibling.

ii. ?Ọ̀rẹ́'mi ni òun àti ìyàwó‾rẹ̀ wá kí mi

It's my friend that he and his wife came to greet me.

iii. ?Taani òun àti ìwọ́ lọ sí Ìbàdàn ní àná?

Who is it that he and you went to Ibadan yesterday?

Sentences like these are definitely ungrammatical if any of the conditions mentioned above are violated. Thus none of the sentences in (41) is even marginally acceptable.

(41) i. *Adé ni mo rí àbúrò mi àti òun

It's Ade that I saw my younger sibling and him.

ii. *Ọ̀rẹ́'mi ni ìyàwó‾rẹ̀ àti òún wá kí mi

It's my friend that his wife and he came to greet me.

iii. *kí ni o ra òun àti ẹ̀fọ́ ní àná

What did you buy it and greens yesterday?

In a relative clause, relativization in a coordinate structure is permitted, but the pronoun òun must replace the relativized noun, and the pronoun must be the first element of the conjunct. Also, the antecedent of òun must be human.

(42) i. ọmọ nâ tí mo rí òun àti Adé wá sí ibí

The child Rel I saw him and Ade came here.

*ọmọ nâ tí mo rí Adé àti òún wá sí ibí

The child Rel I saw Ade and him came here.

ii. ọmọ nâ tí òun àti Adé lọ ilé wà ní ibí

The child Rel he and Ade went home is here.

*ọmọ nâ tí Adé àti òún lọ ilé wà ní ibí

The child Rel Ade and he went home is here.

iii. *ẹ̀fọ́ tí òun àti ilá dùn wọ́n jù

greens Rel it and okra taste good are very costly.

If the embedded coreferent is deleted, as is normal for subjects and objects in Yoruba relative clauses, then the following ungrammatical forms corresponding to (42i and ii) will result.

(43) i. *ọmọ nâ tí mo rí àti Adé wá sí ibí

The child whom I saw and Ade came here.

ii. *ọmọ nâ tí àti Adé lọ ilé wà ní ibí

The child who and Ade went home is here.

The grammaticality of the first member of each pair in (42) may be related to the generalization captured above in (16), where it was noted that in non-desiderative complements the pronoun òun was kept and agreement was blocked if òun was coreferential with some higher NP. In relative clauses, the embedded coreferent is normally deleted, but where the antecedent is human and the embedded coreferent is the first element of a conjunct pronominalization occurs instead of deletion. In just these cases, as shown in (43) deletion would result in an ungrammatical sentence, just as movement would in English. Thus the Coordinate Structure Constraint must apply both to the movement phenomena of focus and to the reduction phenomena of relativization.

The possessive in Yoruba is a right-branching construction and is superficially subject to the Pied Piping Convention. Yoruba linguists distinguish emphatic possessive, using the particle ti to link the possessed noun with the possessor and an unemphatic construction which differs only in that the particle ti is absent. Both constructions, as illustrated in (44) and (45) are right-branching and contain what has been called an Associative Particle (Assoc) [Welmers 1964 and Courtenay 1969], which takes the form of a mid tone which occurs immediately after the possessed noun.[15]

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[15]Because of certain tonal assimilation rules in Yoruba the Associative mid tone is usually heard only before a consonant-initial noun or the consonant-initial emphatic possessive particle ti. For an extensive and lucid treatment of this mid tone see Courtenay [1969].

(44) i. olùkó̩ rí ìwé̩⁻ó̩mo̩

       teacher saw book Assoc child

       The teacher saw the book of the child.

  ii. olùkó̩ rí ìwé̩⁻ti o̩mo̩

       teacher saw book Assoc Emph child

       The teacher saw the <u>child's</u> book.

A longer possessive construction, illustrating its right branching nature, is given in (45i). The possible English glosses are given in (45ii).

(45) i.
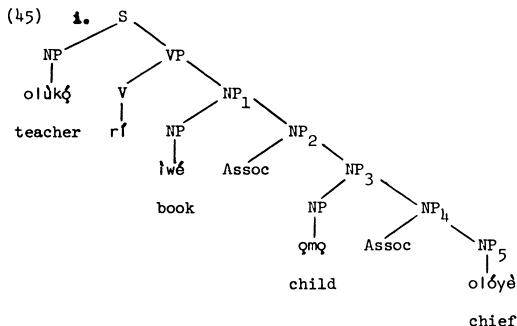
  ii. The teacher saw

       the chief's child's book.

       the book of the chief's child.

       the book of the child of the chief.

Relativization and focus are possible only on NP_1, NP_3, or NP_5.[16] If the NP involved is on a right branch, a pronoun is left behind. The relativized and focused variants are given below.

_____

[16]Question formation could also have been used here, but this process involves the focus of some question word and is therefore subject to the same restrictions as focus.

(46) Relativization in right-branching constructions.

    i. $[_{NP_5}$ olóyè] tí mo rí ìwé-ọmọ $[_{NP_5}$ ⁻rè̩] wà ní ibí

          chief Rel I saw book Assoc child Assoc his is here

          The chief whose child's book I saw is here.

    ii. $[_{NP_3}$ ọmọ⁻olóyè] tí mo rí ìwé $[_{NP_3}$ ⁻rè̩] wà ní ibí

          child Assoc chief Rel I saw book Assoc his is here

          The child of the chief whose book I saw is here.

    iii. $[_{NP_1}$ ìwé-ọmọ⁻olóyè] tí mo rí wà ní ibí

          book Assoc child Assoc chief Rel I saw is here

          The chief's child's book which I saw is here.

(47) Focus in right-branching constructions.[17]

    i. $[_{NP_5}$ olóyè] ni olùkó̩ rí ìwé-ọmọ $[_{NP_5}$ ⁻rè̩]

          chief Topic teacher saw book Assoc child Assoc his

          It's the chief that the teacher saw his child's book.

    ii. $[_{NP_3}$ ọmọ⁻olóyè] ni olùkó̩ rí ìwé $[_{NP_3}$ ⁻rè̩]

          child Assoc chief Topic teacher saw book Assoc his

          It's the chief's child that the teacher saw his book.

    iii. $[_{NP_1}$ ìwé-ọmọ⁻olóyè] ni olùkó̩ rí

          book Assoc child Assoc chief Topic teacher saw

          It's the chief's child's book that the teacher saw.

In each case where the NP to be moved or deleted is on the right branch of some NP, it is pronominalized and the resulting sentence is grammatical. If the NP to be moved or deleted is a highest NP, as in (46iii) and (47iii), no pronominalization occurs. Rather the NP is deleted.

    The behavior of these right-branching constructions is analogous to the Left Branch Condition Ross states for English [1967:207]. The Pied Piping Convention shows up in Yoruba as a constraint on movement or

---

[17]The English translations of (47i) and (47ii) are, of course, un-grammatical, although the Yoruba examples are not.

deletion from the right branch of an NP. The following constraint will account for the syntactic behavior observed in (44-47).

(48) <u>The Right Branch Constraint</u>[18]

No NP which is the rightmost NP of some larger NP may be moved out of or deleted from the larger NP.

The behavior of complex NP structures under relativization and focus presents a slightly different sort of problem.[19] In example (49) there is no variation in grammaticality, whatever pronoun form is used. They are all equally ungrammatical.

(49) *oñjẹ tí mo mọ ọkùnrin

food$_i$ Rel I know man$_j$

tí ó fi $\left\{\begin{array}{c} í \\ òun \\ \emptyset \end{array}\right\}$ fún ọmọ nâ kò dùn

Rel he$_j$ took $\left\{\begin{array}{c} \text{it (dependent)} \\ \text{it (independent)} \\ \emptyset \end{array}\right\}_i$ gave child the not sweet

*The food which I know the man who gave $\left\{\begin{array}{c} \text{it} \\ \emptyset \end{array}\right\}$

to the child does not taste good.

The ungrammaticality of (49) could be attributed to the fact, mentioned above, that òun requires a human antecedent. That this is not the only reason for (49) being bad is shown by the fact that the sentence is equally bad if the dependent pronoun form is used or if the NP is deleted, as we would expect in a relative clause. Further evidence that

---

[18] The Right Branch Constraint was independently proposed by Qláyíwọlá Awóyalé [M.A. Qualifying Examination, December, 1972] at the time this paper was being written.

[19] This discussion of the Complex NP Constraint will be confined to the most obvious cases, to show that the constraint is in fact valid for Yoruba. There are many interesting problems of NP-squishing [Ross 1972] which, for the sake of brevity and clarity, I am ignoring.

the problem lies in the structure and not in the form of the pronoun used comes from the following sentence, where the antecendent of ọ̀un is human.

(50) *ọkùnrin tí mo gbọ́ ìròhìn tí ó sọ kpé
     man Rel I hear news Rel say that

    ạ̀won ọlọ́kpǎ mú $\begin{Bmatrix} \text{ðun} \\ u \\ \emptyset \end{Bmatrix}$ jí owó kpúkpọ̀

    pl. police arrest $\begin{Bmatrix} \text{him (dep)} \\ \text{him (indep)} \\ \emptyset \end{Bmatrix}$ steal money much

    *The man whom I heard the news that the police arrested $\begin{Bmatrix} \text{him} \\ \emptyset \end{Bmatrix}$

    stole a lot of money.

It is also impossible to move a NP out of a complex NP in Yoruba. Given a sentence like (51i), it is impossible to ask a question (51ii) by, for example, questioning the object of fún , thereby fronting it and putting it in focus.

(51)   i. mo mọ obìnrin tí ó bí ọmọ fún ọkùnrin'yẹn
       I know woman Rel SC bear child give man that
       I know the woman who bore that man a child.

   ii. *taa$_i$ ni o mọ obìnrin tí ó bí ọmọ fún $\begin{Bmatrix} \text{ðun} \\ un \\ \emptyset \end{Bmatrix}_i$

      Who$_i$ Topic you know woman Rel SC bear child give him$_i$
      *Who do you know a woman who bore a child to?

   Deletion and movement out of a sentential subject in Yoruba is subject to much the same restrictions as in English. I will illustrate this with the following sentence.

(52) [$_{NP}$ [$_S$ kpé obìnrin nâ ńse oúnjẹ $_S$] $_{NP}$] wù mí
     that   woman the is-cooking food pleases me

As the sentences in (53) show, no NP can be moved out of the embedded sentence. The grammaticality of these sentences is not improved by replacing the moved NP by the pronoun òun.

(53) i. *[$_S$ obìnrin nâ ni [$_S$[$_{NP}$[$_S$ kpé $\left\{\begin{array}{c} ó \\ òun \end{array}\right\}$ ńse ońję $_S$]$_{NP}$] wù mí $_S$]$_S$]

        *It's the woman that that she is cooking food pleases me.

     ii. *[$_S$ ońję ni [$_S$[$_{NP}$[$_S$ kpé obìnrin nâ ńse $\left\{\begin{array}{c} \emptyset \\ ó \\ òun \end{array}\right\}$ $_S$]$_{NP}$] wù mí $_S$]$_S$]

        *It's the food that that the woman is cooking pleases me.

Similarly, if (52) is embedded as a relative clause on either obìnrin or ońję , the resulting sentence will be ungrammatical. Again the sentence is not improved if the embedded coreferent is replaced by a pronoun instead of being deleted.

(54) i. *[$_{NP}$ obìnrin nâ [$_S$ tí [$_{NP}$[$_S$ kpé $\left\{\begin{array}{c} ó \\ òun \end{array}\right\}$ ńse ońję $_S$]$_{NP}$] wù mí $_S$]$_{NP}$]

            woman the   Rel   that she is-cooking food pleases me
         ni ìyàwó-ègbón 'mi
         is wife of senior sibling my
         *The woman who that (she) is cooking food pleases me is my
         older brother's wife.

     ii. *àkàrà àti ękǫ ni [$_{NP}$ ońję [$_S$ tí [$_{NP}$[$_S$ kpé obìnrin nâ
         beancakes and porridge is food Rel that woman the
         ńse $\left\{\begin{array}{c} \emptyset \\ ó \\ òun \end{array}\right\}$ $_S$]$_{NP}$] wù mí $_S$]$_{NP}$]
         is-cooking pleases me
         *Beancakes and porridge is the food which that the woman is
         cooking (it) pleases me.

Just as in English, however, if the subject clause is extraposed, the sentences (56) corresponding to (53) and (54) are grammatical. The basic extraposed form is given in (55).

(55) ó wù mí [_S kpé obìnrin nâ ńse oñjẹ _S]

    It pleases me that the woman is cooking food.

(56)   i. obìnrin nâ ni [_S ó wù mí [_S kpé ó ńse oñjẹ _S]_S]

          woman the it is pleases me that is-cooking food
          It's the woman that it pleases me that (she) is cooking food

    ii. oñjẹ ni [_S ó wù mí [_S kpé obìnrin nâ ńse _S]_S]

          food it is pleases me that woman the is-cooking
          It's food that it pleases me that the woman is cooking.

    iii. [_{NP} obìnrin nâ [_S tí ó wù mí [_S kpé ó ńse oñjẹ _S]_S]_{NP}]

          woman the Rel pleases me that is—cooking food
          ni ìyàwó-ẹ̀gbọ́n 'mi
          is wife of senior sibling my
          The woman who it pleases me that (she) is cooking food is
          my older brother's wife.

    iv. àkàrà àti ẹ̀kọ́ ni [_{NP} oñjẹ [_S tí ó wù mí

          Beancakes and porridge is food Rel pleases me
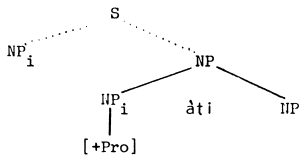   [_S kpé obìnrin nâ ńsè _S]_S]_{NP}]
          that woman the is-cooking
          Beancakes and porridge is the food which it pleases me that
          the woman is cooking.

5.3. **A revision of island constraints in Yoruba.** On the basis of the
evidence from pronominalization and deletion, island constraints in
Yoruba can be divided into two pairs. The first pair consists of the
Coordinate Structure Constraint and the Right Branch Constraint, and the
second consists of the Complex NP Constraint and the Sentential Subject
Constraint. Constraints of the first type permit the structure just if
the NP to be moved or deleted is pronominalized. That is, the following
output structures are permitted in Yoruba in configurations which are
subject to the Coordinate Structure Constraint (57i) or the Right Branch
Constraint (57ii). A represents any constituent.

(57) **i.**

```
                         S
      NP_i ·········/        \
                        NP
              /      |       \
           NP_i    àti      NP
           |
         [+Pro]
```

ii.

```
                  ·S·
     NP_i ····/        \
                       NP
               /              \
              A               NP_i
                              |
                            [+Pro]
```
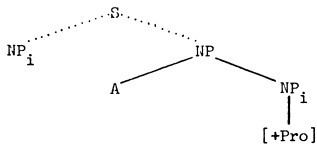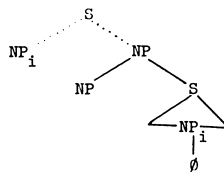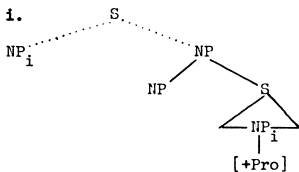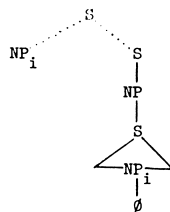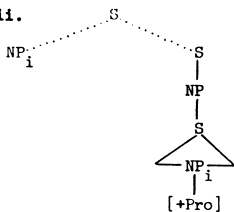
Corresponding structures in which the pronominalized NP has been deleted are ungrammatical.

Constraints of the second type permit neither pronominalization nor deletion, and so the following output structures for configurations which are subject to the Complex NP Constraint (58i) or the Sentential Subject Constraint (58ii) are ungrammatical.

(58) **i.**

```
           S.                                        S.
  NP_i ··/    \                             NP_i ··/    \
              NP                                        NP
            /    \                                    /    \
          NP      S                                 NP      S
                 /‾\                                       /‾\
               NP_i                                      NP_i
               |                                         |
             [+Pro]                                      ∅
```

ii.

```
        S.                                         S.
NP_i ··/   \                              NP_i ··/   \
           S                                         S
           |                                         |
          NP                                        NP
           |                                         |
           S                                         S
          /‾\                                       /‾\
        NP_i                                      NP_i
        |                                          |
      [+Pro]                                       ∅
```

The obvious difference between (57) and (58) is the presence of the circled S node which intervenes in (58) between the antecendent and the pronominalized or deleted NP. In order for pronominalization to be blocked by a constraint, it apparently must be necessary that there be an essential S in the formulation of the constraint. Thus the Complex NP and Sentential Subject Constraints cannot be stated without referring to an embedded S node, an essential S. The Coordinate Structure and Right Branching Constraints, on the other hand, ignore the presence of an intervening S and no S need be mentioned in the formulation of these constraints. I will refer to constraints of the former type as essential S constraints and of the latter type as non-essential S constraints.

Ross [1967:426-28] divides reordering rules into chopping and copying rules. Chopping rules consist of copying and replacement of the copied element by zero or some element not identical to the copied element. In a copying rule the element which has been copied also remains behind. Ross then makes the claim that "chopping rules are subject to the constraints...; copying rules are not." Interpreted in this way, island constraints are not applicable to relative clause formation in Yoruba, since, as I showed earlier, relative clauses involve only deletion or pronominalization and not copying. Yet certain ungrammaticalities result from relative clause formation in just those cases where a reordering constraint would have been violated if reordering were the relativization process in Yoruba. The question, then, is just what processes are subject to island constraints in Yoruba. In putting in focus an element which is subject to a non-essential S constraint, copying and pronominalization are permitted, but deletion is blocked. In putting in focus an element subject to an essential S constraint, deletion, pronominalization, and copying are all blocked. Since copying must apply before pronominalization or deletion can apply, it would be sufficient to say that copying out of an essential S configuration is blocked, just as in English. This would block both pronominalization and deletion, since their structural descriptions would not be met. However, in relativization into a non-essential S configuration, pronominalization is permitted but deletion is blocked. In relativization

into an essential S configuration, pronominalization is blocked and there-
fore deletion will also be blocked. But now the constraints cannot be on
copying. Rather they behave as if they were constraints on pronominali-
zation.

We are then faced with the question of what island constraints actu-
ally do constrain in Yoruba. A plausible solution could be developed
along the following lines. It can be shown easily that Yoruba does not
permit sentences like those in (59), where whether or not the structural
description for pronominalization has been created by copying, pronomi-
nalization has failed to apply.

(59) i. *àkàrà ni Dàdá jẹ àkàrà

            beancakes Topic Dada ate beancakes

         *It's beancakes that Dada ate beancakes.

      ii. *Qlá jẹ àkàrà tí baba¯Qlá ra àkàrà

           Qla ate beancakes Rel father of Qla bought beancakes

          *Qla ate the beancakes which Qla's father bought the beancakes.

The fact that pronominalization and/or deletion are obligatory in
sentences of this sort means, in effect, that sentences like (59) which
may show up as intermediate derived structures in the derivation of the
focused and relativized sentences in (60) are blocked from occurring as
grammatical surface structures.

(60) i. àkàrà ni Dàdá jẹ

           It's beancakes that Dada ate.

      ii. Qlá jẹ àkàrà tí baba¯rẹ̀ rà

           Qla ate the beancakes which his father bought.

In those cases where deletion is blocked by a non-essential S constraint
no real problem exists. Non-essential S constraints simply block a
smaller set of sentences than essential S constraints. In those cases
where pronominalization is blocked by an essential S constraint the un-
grammaticality of a surface output containing a pronoun can be accounted
for by the fact that these structures block pronominalization. If pro-
nominalization has not occurred, as in (59), the sentence will be

ungrammatical because pronominalization has not applied where it was obligatory, even though its application would have violated an essential S constraint. Thus a sentence which has undergone copying or which for some other reason meets the structural description of pronominalization must undergo pronominalization. If the sentence contains a configuration defined by a non-essential S constraint, deletion will be blocked, but the pronominalized version will be grammatical. If it contains a configuration defined by an essential S constraint, pronominalization will be blocked, and in this case the non-pronominalized form will also be ungrammatical because of its failure to undergo an obligatory rule.

The distinction between essential S and non-essential S constraints introduces the notion that some constraints are stronger than others. That is, the set of conditions under which non-essential S constraints can be violated contains as a proper subset the set of conditions under which the essential S constraint can be violated. Thus the essential S constraints block a larger set of processes and are more powerful. This notion becomes quite natural when one considers that the effect of this ranking of constraints in Yoruba is to make NP's contained in embedded sentences less accessible to reordering, pronominalization and deletion than NP's contained in islands whose description does not include an essential S.

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LOCATIVES IN BANGANGTE-BAMILEKE[1]

Jan Voorhoeve
Rijksuniversiteit te Leiden

1. Introduction

Several scholars have stressed the Bantu character of Bamileke, e.g.
Hyman and Voeltz [1971], which is claimed to be especially evident in
the noun-class system [Voorhoeve 1971]. However, the typically Bantu
locative prefixes pa- , ku- and mu- (classes 16, 17 and 18) seem to-
tally absent. These prefixes often occur as pre-prefixes on nouns, which
may govern concord in dependent morphemes. The following examples from
Safwa (M 25) may replace a lengthy discussion (concordial prefixes under-
lined):

(1) mu-ši-táabu ʃi-ši   'in this book' (the demonstrative shows
                              concord with the nominal prefix)

     hw-ʃ-jeenje uú-hw-o   'towards that ravine' (the demonstrative
                              shows concord with the locative pre-prefix)

Not even remnants of these locative prefixes are found, e.g. in locative
adverbs like 'somewhere', 'below' or 'above'. If we are that sure about
the inclusion of Bamileke in Bantu, we might envisage the possibility
that the locative prefixes constitute a later Bantu innovation, after
Bamileke and other neighboring languages have split off.

Instead of the Bantu system of locative prefixes or pre-prefixes
governing concord in dependent morphemes, Bamileke uses different
lexical means:

---

[1]I follow Hyman's suggestion in distinguishing the Bamileke dialects
as Feʔfeʔ-Bamileke, Bangangte-Bamileke, etc. This study has been made
possible by a grant from the Netherlands Organisation for Tropical
Research (WOTRO) under no. W 39-17. This grant made possible a 9-month
stay of a Bamileke informant, Mr. Joseph Tchouane, in Holland. This
paper was first presented at the 11th West African Language Conference
at Yaoundé, April 1974.

a. three prepositions indicating relative elevation in relation to the speaker: mvə̀ (higher than the speaker), mà (lower than the speaker), and nə́ (on the same level as the speaker);

b. a great many locative specifications (often related to nouns): nùm 'on', nûm 'in', mbáŋ 'next to', etc.

c. locative adverbs (only three have been found): bwə́ 'there', tə̌ 'above', nsî 'below'.

These may be summarized in :

(2) a bə́ d̂ mvə́ nûm bwə́

    2 1 2 1 2   1

    'it is far away higher than the speaker (mvə́) on (nûm) there (bwə́), it is there'[2]

Next to these lexical locative phenomena, one observes two other locative phenomena:

_____

[2] The surface tone is indicated in two ways which can be converted automatically. The number notation uses 1 as the highest level of pitch, and n as the absolute lowest. For practical use I developed a Christaller type of tone notation, indicating the change of level: no tone mark is used phrase-initially or for a tone that is on the same level as the preceding tone; an acute accent indicates a change to one level higher than the preceding tone; a vertical accent a change to one level lower; a grave accent a change to two levels lower, and a double grave accent a change to the lowest voice pitch. Double vowels accomodate glides, and do not indicate vowel length. This practical surface notation has been worked out with the help of my colleagues A. E. Meeussen and Th. C. Schadeberg and proved to be the only notation which could be handled by the informant. The surface notation does not contain clear clues as to the underlying tones. Acute accent always marks an underlying high, and double grave accent always marks an underlying low tone phrase-finally. Vertical and grave accent may mark both underlying high and low tone. If the level reached does not change to a higher one, it is underlying high; if it changes to a higher one, it is underlying low. In underlying representation (between slant lines) acute accent indicates underlying high and grave accent underlying low tone. A floating tone in underlying representation is symbolized by a tone-marked x.

d. a change of concordial class in a restricted number of nouns:

(3) bu ɑm   'my hand' vs. bu ằɒ   'in my hand'
   1 1   1 n

   bɑm sɑ́m 'my belly' vs. bɑm ɑ́m   'in my belly'
   2   1   2 1

e. a change in the tonal relation between the verb and the locative
complement:

(4) a lо́ớ? lɑ́?   'and he takes the compound' vs.
   1 12 1

   a kuɒ̀m lɑ?   'and he arrives at the compound'
   1 13 3

Both sentences use a low verb in the same consecutive tense.

These phenomena can be summarized by the following pair of sentences:

(5) a.   a bɔ́ d̀ lɑ́? sɑm   'it is my compound'
       2 1 2 1 1

   b.   a bɔ́ d̀ lɑ? ɑ̀m   'it is in my compound'[3]
       2 1 3 3 n

This paper will study the last two phenomena and try to relate them
to the Bantu locative constructions.

2. Change of Concordial Class

A restricted set of nouns are used as locative complements without
any prepositional introduction. However, a change of concordial class
in that case takes place, as shown in the following list:

(6) tu ɑm   'my head'   tu ằm   'on my head'
   1 1   1 n

   bu ɑm   'my hand'   bu ằm   'in my hand'
   1 1   1 n

   tɔ ɑm   'my throat'   tɔ ằm   'in my throat'
   1 1   1 n

   ben ɑm   'my garden'   ben ɑ̀m   'in my garden'
   1 1   1 n

---

[3]Notice both the difference in tone on the unidentified particle
/d̀/ followin the verb /bɔ́/ 'to be', as well as the different forms
for 'my': /sɑ́m/ and /ɑ̀m/.

(6) (cont.)

| kəkə́g am | 'my armpit' | kəkə́g àm | 'under my arm' |
| 2 1 1 | | 2 1 n | |

| la? sam | 'my compound' | la? àm | 'in my compound' |
| 1   1 | | 1   n | |

| bam sə́m | 'my belly' | bam ə́m | 'in my belly' |
| 2   1 | | 2   1 | |

| mvεn àə̀m | 'my back' | mvεn ə́m | 'on my back' |
| 2   2n | | 2   1 | |

Another group of nouns are used as locative complements without any
change of concord and without a prepositional introduction:[4]

(7) nda àm   'my house, in my house'
    1   n

    kab àm   'my pot, in my pot'
    1   n

    ndɔ àm   'my drinking horn, in my drinking horn'
    1   n

    ncu ə́m   'my mouth, in my mouth'
    2   1

    tun ə́m   'my anus, in my anus'
    2   1

Although the number of items is restricted, the change of concord in (6)
seems to be governed by rules. My informant could predict that the fol-
lowing changes of concord would operate, if the following nouns could be
used in a locative construction without a prepositional introduction:

(8) mbə? sə́m | 'my shoulder' | mbə? ə́m | 'on my shoulder' |
    2   1 | | 2   1 | |

    kwun sam | 'my bed' | kwun àm | 'in my bed' |
    1   1 | | 1   n | |

but: tɔŋ ə́m | 'my ear, in my ear' |
     2   1 | |

---

[4] A very small difference may be observed in the pronunciation of these
unnatural isolated examples. The non-syllabic nasal prefix is realized
on a higher pitch in the locative complement. If there is no prefix, the
initial voiceless consonant is realized as slightly more tensed in the
locative complement. This may be due to the effect of a preceding
floating high tone. In non-isolated examples these phenomena cannot be
detected.

Bangangte-Bamileke has the following concord system:[5]
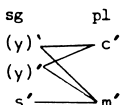
The possessive pronoun for the 1st person sg. is /àm/, /ám/ or /sám/, and in the plural is /cám/ or /mám/, depending on the concordial class of the noun. A locative noun uses in all cases the concord (y), but the tone of the latter is opposite to the tone of the noun stem: H in the case of L tone nouns, and L in the case of H tone nouns. Some illustrations from recorded texts follow:

(9) kəə́ ghʉ o kə tə́ cə́ʔ só tʉ̀ ö̀ ɑ
     12   2 2 2 1 2   1 2 n n

    'what makes you not put hat yours on-head yours?'

    (what is it that makes you do not put your hat on your head?)

    cʉb cə́ʔ só bʉ̀ ò ntám njàm ám
    1   2   1 2 3 2   3 2

    'take hat yours in-hand yours go behind me'

    (take your hat in your hand and follow me)

If the locative concord is tonally different from the non-locative one (as in most examples in (6)), this changes the tonal concord of the genetive construction. The following examples may illustrate this:

(10) buù nzwil tswə́mɑ̀ɑ̀nkoʔ
     13   34   3 3n n

    'the hand of the wife of tortoise'

    buʉ́ nzwíl tswə́mɑ̀ɑ̀nkoʔ
    12   12   1 1n n

    'in the hand of the wife of tortoise'

---

[5]The symbol (y)' indicates a concordial element which is y- or ø- (depending on the position of the pronoun in relation to the noun: pre-position or postposition respectively), but always followed by a L pronominal stem. Only post-position pronouns are used in illustrations.

(10)(cont.)

     mvɛn nzwʃl tswɔ́maȁnko?
      2   12   1 1n n

     'the back of the wife of tortoise'

     mvɛɛ́n nzwll tswɔ́maȁnko?
      21   23   2 2n n

     'on the back of the wife of tortoise'

    The reader may be referred to a previous article [Voorhoeve 1971] to appreciate these examples.[6] The underlying representations of (10) (with tonal concord underlined) are:

(11) /x̀-bʊ́-x̀ x́ ɦ-zwʃ .../
     /x̀-bʊ́-x̀ x̀ ɦ-zwʃ .../
     /ɦ̀-vɛ̀n-x̀ x̀ ɦ-zwʃ .../
     /ɦ̀-vɛ̀n-x̀ x́ ɦ-zwʃ .../

    One is tempted to introduce the concept of contrastive or polar tone in describing the locative concord. Informally the rule would be phrased as follows:

(12) The concord of a locative complement (for this restricted set of
      mostly inalienable nouns) is (γ)- with a tone which is polarized
      with respect to the tone of the preceding noun stem.

This is a curious kind of rule. Polar tones introduce a third value of a tone feature, which is given in the lexicon as +, - or blank. The blank is filled by a rule:

(13) [blank] → [-α tone]/[α tone]

Alternatively, one can assign the tone arbitrarily and change it by a rule to a polar tone. Or one may introduce a special feature [polar tone]. All three solutions seem unattractive. In most cases a solution involving polarization can be avoided, if the polar tone can be spelled out as HL or LH with the appropriate tone rules.

---

[6] The tonal concord in the genetive construction is identical with the tone of the (possessive) concord: L in class (γ)ʻ and H in all other classes.

There is reason to believe that the pronominal stem /-àm/ has L
tone. This L tone is replaced by a preceding floating H (after the con-
cords (y)ᐟ, sᐟ, cᐟ and mᐟ). If the special locative concord is a
floating H, one should set up / x́-àm/ for all possessive pronouns in a
locative complement:

(14)   /bú x́-àm/   'in my hand'
       /bàm x́-àm/   'in my belly'

A special rule is then added which deletes the floating H after a H tone.
If the floating H is not deleted, the general rule works and the floating
H replaces the L tone of the pronominal stem. These two rules change
/bú x́-àm/ into /bú àm/ and /bàm x́-àm/ into /bàm ám/.[7]

This analysis offers very interesting historical insights. If, as
in other Bantu languages, the locative complement consists of a locative
pre-prefix (LP), a nominal prefix (NP) and a noun stem (NS), and depen-
dent pronouns show concord with the locative pre-prefix and consist of a
locative concord (x́-) and a pronominal stem (-àm), the change of con-
cord in Bangangte-Bamileke reveals the relation of Bamileke with Bantu.
However, this is only evident in a restricted set of mostly inalienable
nouns. The Bamileke locative system seems to move in a different direc-
tion (using prepositions in other nominal complements), but reveals in
a set of relics an older more Bantu-like system. The existence of a
locative pre-prefix on nouns has not yet been demonstrated. This phe-
nomenon will be studied next.

3. The Tonal Relation between Verb and Locative Complement

Example (3) shows two phenomena, the change in concord between
lɑʔ sɑm 'my compound' and lɑʔ ə̂m 'in my compound', but also a change
    1   1   1 n
in the tonal relation between the verb /bə̂/ 'to be', the following ele-
ment /à/ (without a clear meaning) and the noun /x̀-lǎʔ-x̀/ 'village',
'compound'. The change consists of a general lowering of the tone level

---

[7]This solution was proposed by my colleague T. L. Cook. It creates
a special problem. The special locative tone rule ignores the floating
tone after the noun stem, which should be deleted before the rule applies.

of the element /d̀/ and the following complement. The same lowering of
tone level is observed after verbs of four different tonal shapes (R =
radical):

a. after prenasalized verbs /ń-R-ɑ́/,[8]

b. after the subjunctive /ɑ́-R-ɑ́/,

c. after the consecutive /ɑ́-R-ɑ̀/, and

d. after the relative of the completive /ɑ́-R-ɑ̀ɑ́/.

In the last two tenses a distinction between L and H radical is neutra-
lized to L. In the first two cases the tonal phenomena are only present
after an L radical. One may therefore conclude that this tonal pheno-
menon is conditioned by an H verbal prefix (ń- or ɑ́-) and an L radi-
cal. Moreover, only H locative nouns are subjected to the lowering in-
fluence. I present here per number a series of 8 elicited examples with
an L and an H radical (mostly -kùm- 'arrive' or -lɔ̀ʔ- 'take' and
-tʊ́m- 'leave' or -yɛ́n- 'see'), and an L and an H locative or non-
locative noun (mostly /ǹ-zɘ̀-ɑ̀/ 'road' and /ɑ̀-lɑ́ʔ-ɑ̀/ 'compound').
Locative complements are found in the left column, non-locative ones in
the right column:

(15) after a prenasalized verb:

  a. a nkə ntum nzɘ̀   a nkə njən nzɘ̀   (from -yɛ́n-)
      1   1   1   n   1   1   1   n
      'he used to leave the road'   'he used to see the road'

  b. a nkə ntum lɑ́ʔ   a nkə njən lɑ́ʔ
      1   1   1   2   1   1   1   2
      'he used to leave the compound'   'he used to see the compound'

  c. a nkə nkuʊ̀m nzə   a nkə ndoɔ̀ʔ nzə   (from -lɔ̀ʔ-)
      1   1   1n   n   1   1   1n   n
      'he used to arrive at the road'   'he used to take the road'

  d. a nkə nkuʊ̀m lɑ́ʔ   ≠   a nkə ndoɔ́ʔ lɑ́ʔ
      1   1   13   3   1   1   13   2
      'he used to arrive at the   'he used to take the compound'
      compound'

---

[8] I cannot present all the evidence for the underlying forms posited
in this paper. Some arguments may be found in section 4.2.

e. nkuùm Ia? ntswə nừm diaə́ŋ mvə̀n mbɑ́? kừ έ
   13   3   3 4 443   4   3   4 3
   '(he) arrived at-compound took-place on chair of-chief crossed
   legs his' (he arrived at the compound, sat down on the chair of
   the chief and crossed his legs).

(16) after the subjunctive:

   a. a tú̀m nzə̀   a yə́n nzə̀
      2 1   n   2 1   n
      'that he may leave the road'   'that he may see the road'

   b. a tú̀m Iɑ́?   a yə́n Iɑ́?
      2 1   2   2 1   2
      'that he may leave the   'that he may see the compound'
      compound'

   c. a kú̀m nzə   a Ió̋? nzə
      2 1n   n   2 1n   n
      'that he may arrive at the   'that he may take the road'
      road'

   d. a kú̀m Iɑ?   ≠   a Ió̀? Iɑ́?
      2 13   3   2 13   2
      'that he may arrive at   'that he may take the compound'
      the compound'

(17) after the consecutive:

   a. a tűm nzə   a yə̀ə̀n nzə
      1 1n   n   1 1n   n
      'and he leaves the road'   'and he looks at the road'

   b. a tűm Iɑ?   ≠   a yə̀ə́n Iɑ́?
      1 13   3   1 12   1
      'and he leaves the compound'   'and he looks at the compound'

   c. a kűm nzə   a Iò̋? nzə
      1 1n   n   1 1n   n
      'and he arrives at the road'   'and he takes the road'

   d. a kűm Iɑ?   ≠   a Iò̀? Iɑ́?
      1 13   3   1 12   1
      'and he arrives at the   'and he takes the compound'
      compound'

e. mandɔ́ɔ́m tuùm ndɑ ntɑʔ mə̀sə́ŋə
    1 21   13   3   3   4 3 3

    'man leaves house chases small-bird' (and the man goes out of the

    house and chases the little bird)

(18) after the relative of the completive:

a. z'a tɔ́ùm nzə lɑ̂   z'a yə́ə̀n nzə lɑ̂
    2 13   3 2   2 13   3 2

    'who left the road'   'who saw the road'

b. z'a tɔ́ùm lɑʔ lɑ̂   ≠   z'a yə́ə̀n lɑ̂ʔ lɑ
    2 13   3 4   2 13   2 3

    'who left the compound'   'who saw the compound'

c. z'a kɔ́ùm nzə lɑ̂   z'a lɔ́ɔ̀ʔ nzə lɑ̂
    2 13   3 2   2 13   3 2

    'who arrived at the road'   'who took the road'

d. z'a kɔ́ùm lɑʔ lɑ̂   ≠   z'a lɔ́ɔ̀ʔ lɑ̂ʔ lɑ
    2 13   3 4   2 13   2 3

    'who arrived at the compound' 'who took the compound'

In a simple surface description one could state that an H locative com-
plement is realized one level lover (or in case of the consecutive two
levels lover) after a low radical preceded by a high prefix.

4. **Analysis of the Locative Tone**

4.1. **The locative high tone.** One would like to attribute the lovering
influence in a locative complement to some defined locative tone. In
Bangangte-Bamileke a lovering influence must often be attributed to a
floating high tone. This may be demonstrated in the genetive construction:

(19) a. nduǔ mɛ́n   'the husband of the child'
        12 1

    b. nduǔ mɛn   'the husbands of the child
        13 3

The lovering should be attributed to a high tonal concord in (19b) as
opposed to a low tonal concord in (19a). The basic tone rule which is
responsible has been described as a lovering of an H tone after HL
[Voorhoeve 1971]. Discussion with my colleague A. E. Meeussen convinced
me that this anti-universal rule should be abandoned in favor of the

equally plausible and more universal lowering of an L in the environment
H—H. The underlying forms of (19) are as follows (tonal concord under-
lined):

(20) a. /n̄-dú-x̀ x̱ x̀-mɛ́n-x̀/
      b. /n̄-dú-x̀ x̱ x̀-mɛ́n-x̀/

Two successive strings of HLH in (20b) create two successive lowerings
(downsteps) which realizes mɛn (itself carrying H tone) on level 3 (in
19b) instead of on level 1 (in 19a).

In the same way one might set up the underlying forms of (5):

(21) a. /à bɔ́ d̀   x̀-ìd̂? .../
      b. /à bɔ́ d̀ x̱ x̀-ìd̂? .../

The underlying /x̱/ in (21b) has the same effect on the noun /ìd̂?/
(which is realized on level 3 instead of level 1), and explains at the
same time the downstep in /d̀/.

If my analysis is correct, the lowering effect on the locative com-
plement should be attributed to a floating high tone, preceding this com-
plement. This floating tone will be called the locative tone (or in a
more historical perspective the locative pre-prefix). The effect of this
tone will be studied in the verb forms in (15) - (19).

4.2. _Generalities about verb forms_. Very little is known about the
Bamileke verb system. A short article by Dunstan [1963] leaves aside
the tonal analysis. Hyman [1972] devoted a few pages to the verb, but
the system seems much more complicated than he assumes. Let me outline
some of the main problems here.

One observes a host of auxiliaries making very subtle distinctions
in meaning. E.g., the auxiliary /cə́g/ indicates that the action started
in the early hours, the auxiliary /zí/ that the action was premeditated
the day before, the auxiliary /ghə̀/ that a preceding action must have
been completed before this one started, the auxiliary /bɛ̀n/ that the
action is a repetition of some former action, etc. Some auxiliaries may
be combined. They make different demands on the form of the main verb.

The radical of the main verb can only show one tonal distinction (L or H), e.g., the radicals /tɔ̀g/ 'to spit' and /tɔ́g/ 'to pass' in

(22) a kwè? ntɛ́d ndɨ̀d mbɛ́d ntɔ̀ɔ̀g ntsî ntɔg ...
      1 12   1   23   2   24   3   3
      'she ent-on encountered house of-excrement spat saliva passed'
      (she went on and encountered a house of-excrement, spat saliva
      and passed...)

One will never find more than two segmentally identical verb roots, dis-
tinguished only by tone. This is one of the main reasons why I try to
analyze Bamileke on a deeper level with L and H tones only.

The radical may behave different tonally in different constructions.
A prenasalized low verb has a different tone from its non-prenasalized
counterpart. Let me give an example with the radicals /túm/ 'to leave'
and /kùm/ 'to arrive':

(23) a. with H radical   tumə   ntumə
                             1 1   1 1

      b. with L radical   kumɔ́   nkumɛ̀
                             2 1   1 2

The same kind of tonal effect of the nasal prefix is found in Fe?fe?-
Bamileke. The H radical is realized on a mid tone in both cases (pre-
nasalized or not), but the L radical is realized as a raised low to mid
if non-prenasalized, and as high (higher than mid) if prenasalized. This
makes it clear that there exists a nasal prefix in Bamileke which exerts
a tonal influence. It is normal practice to attribute this effect to the
inherent tone of the nasal prefix; I have posited a high nasal prefix
/ɦ́-/.

Example (23) shows that there is a vocalic release, realized as a
predictable vowel sentence-finally or before pause.[9] This vocalic re-
lease bears an independent tone. One is therefore entitled to expect
a verbal suffix with its inherent tone. In any case the verb form is
more complex than was thought before. Without distinguishing different

_____

[9]This vowel is identical with the preceding vowel after vowels or
glottal stops, and /ə/ in all other cases.

morphemes in the main verb, one cannot analyze the verb tones. In the following example I present some shapes of the radical /lôʔ/ 'take':

(24) a. a loóʔ jú   'and he takes the thing'
        1 12   1

     b. a lóóʔ jû   'he has taken the thing'
        1 32   3

     c. a nkə ndoóʔ jú   'he used to take the thing'
        1 1   13   3

     d. a lóóʔ jú   'that he make take the thing'
        2 13   2

     e. a aʔ loóʔ jû   'he will take the thing'
        2 2   21   2

I cannot present here all the details of the verb system. I only want to make clear that the main verb is complex and should in any case have a prefix and a suffix.

4.3. <u>The locative tone after verb forms</u>. Four verbal forms show a lowering of a following high locative complement:

(25) a. ń–R–x́   (prenasalized verb)
     b. x́–R–x́   (subjunctive)
     c. x́–R–x̀   (consecutive)
     d. x́–R–x̀x́ (relative of completive).

The last two tenses (consecutive and relative of completive) also show neutralization of an H radical to L. This neutralization can be produced as an assimilation of the radical to an L post-radical tone:

(26) H → L / ʮ [—]$_R$ L[ ]^{10}

The final segment in the environment is necessary to exclude from this rule a simple consecutive in sentence-final position. In this case the H radical keeps distinct:

(27) a. a tum   'and he leaves'   (-túm-)
        1 1

     b. a kùum   'and he arrives'   (-kùm-)
        1 1n

---

[10] H̥ or L̥ indicate a floating H or L tone.

The locative rule can now be phrased as the lowering of an H locative complement after a low radical preceded by an H verbal prefix. The fourth lines of examples 15-18 summarize all instances of this lowering:

(28) a. a nkə nkuùm Iɑʔ   ≠   a nkə ndoǒʔ Iɑ́ʔ
         1   1   13   3   1   1   13   2

      b. a kúùm Iɑʔ   ≠   a Ióǒʔ Iɑ́ʔ
         2 13   3   2 13   2

      c. a kuùm Iɑʔ   ≠   a Ioǒʔ Iɑ́ʔ
         1 13   3   1 12   1

      d. z'a kúùm Iɑʔ Iɑ̀   ≠   z'a Ióǒʔ Iɑ́ʔ Iɑ̀
            2 13   3   4   2 13   2   3

If the lowering influence is attributed to a floating high locative tone (as suggested in 4.1), the underlying forms of (28) should be:

(29) a. /...ʜ́-kùm-x́ x́ x̀-Iɑ́ʔ.../   ≠ /...ʜ́-Iòʔ-x́ x̀-Iɑ́ʔ.../

      b. /...x́-kùm-x́ x́ x̀-Iɑ́ʔ.../   ≠ /...x́-Iòʔ-x́ x̀-Iɑ́ʔ.../

      c. /...x́-kùm-x̀ x́ x̀-Iɑ́ʔ.../   ≠ /...x́-Iòʔ-x̀ x̀-Iɑ́ʔ.../

      d. /...x́-kùm-x̀x́ x́ x̀-Iɑ́ʔ.../   ≠ /...x́-Iòʔ-x̀x́ x̀-Iɑ́ʔ.../

Without any special rule, the non-locative complement should be as low as the locative one. The main tone rule downdrifts one L segment between H segments, while there is no downdrift if more L segments are interposed. This rule already gives the wrong results in (25c) and (25d) (left column), because the low radical is followed by a low segment. Downdrift should not occur here, but it does. One should therefore have a rule which deletes a floating low after a low radical:

(30) L̥ → ∅ / L]$_R$ —

This rule should follow rule (26). It also deletes the floating L in the right columns of (29c) and (29d). After this rule the underlying forms of (29c) and (29d) are:

(31) c. /...x́-kùm x́ x̀-Iɑ́ʔ.../   ≠ /...x́-Iòʔ x̀-Iɑ́ʔ.../

      d. /...x́-kùm-x́ x́ x̀-Iɑ́ʔ.../   ≠ /...x́-Iòʔ-x́ x̀-Iɑ́ʔ.../

Now only (31c) right column does not produce downdrift, as required. All other forms produce it. The only remaining problem is that (29a, b, d)

right column should produce downdrift on the verb radical, but not on the subsequent complement. This effect can only be produced if the low nominal prefix of the non-locative complement is deleted or changed to high. This could be executed by a rule like:

(32) $\underset{\circ}{L} \rightarrow \underset{\circ}{H} / \underset{\circ}{H}]_{VP} {}_{NP}[\text{ — } H$

This rule might in fact have to be more complicated, because the rule might be related to another one which changes a floating L to floating H before a complement, as shown in the following examples:

(33) a aʔ nɛɛ̀n   'he will go'
      2 2   2n

      a aʔ loɔ́ʔ ĺdʔ?   'he will take the compound'
      2 2   21   2

But this will for the moment be left out of consideration. Rule (32) does not apply to the forms in the left column, because there the NP starts with a high locative tone.

This analysis again presents interesting historical insights. The locative floating high tone seems to qualify as a prefix, preceding the nominal prefix. However, unlike the locative pre-prefix in Bantu, this prefix is high.

5. The Synchronic Relevance of Floating Tones

Hyman [1972] raised the question about the synchronic relevance of the host of floating tones which I had to posit in the analysis of the Bamileke data. In the genetive framework [Voorhoeve 1971] these tones proved clearly relevant from a historical point of view, but does this necessarily mean that they are also synchronically relevant? In fact, when one comes across a relatively simple 2-syllable construction like nduù mɛn 'the husbands of the child'(19b) and one has to accept an
    13 3
underlying representation like in (20b) /ǹ-dɔ́-ꜝ ꜝ ꜝ-mɛ́n-ꜝ/ (with three intervening floating tones), which is transformed by relatively simple tone rules into the required simple output, one may wonder why new generations of Bamileke did not invent shortcuts based on simplified underlying representations at the expense of more complicated or less universal

tone rules. This would in fact be possible, in the nominal constructions.
A rule which accepts automatic downstep between high tones would reduce
the underlying representation of (20b) to /ndú x́ mɛ́n/, which seems al-
ready much more acceptable from a synchronic point of view.

In the case of the locative construction in Bangangte-Bamileke we are
confronted with new floating tones (verbal prefixes and suffixes, and a
locative tone) which are less well motivated by comparisons with other
Bantu languages. Dialectal evidence may replace the general Bantu argu-
ments. I mentioned in section 4.2. that prenasalized L verb radicals
show the same type of tonal characteristics in Bangangte and Feʔfeʔ.
Feʔfeʔ-Bamileke shows a high /ʌ́/ before the pronoun of a subjunctive
verb form [Hyman 1972:151]. Bangangte-Bamileke has a floating high tone
in the same position, which accounts for the rising tone of a preceding
L morpheme or a falling tone of the following L pronoun. The floating
tone in one of the dialects matches a vocalic segment in one of the other
dialects.

But even in the same dialect one finds floating and segmental alter-
nations. The examples in (23) show a vocalic release of verb forms in
sentence-final position. This vocalic release with H tone is only pre-
sent sentence finally:

(34) L radical   H radical

      a nsǀ nɛ́nɔ́ 'he will go'   a nsǀ tùmə 'he will leave'
      1   2 3 2   1   2 3 3

      a bə nɛ́nɔ́ 'while he went...'   a bə tùmə   'while he left...'
      1 1 3 2   1 1 3 3

      nɛ́nɔ́   'go'   tumə   'leave'
       2 1   1 1

The tone of the vocalic release is combined with the radical tone, if the
verb is in non-final position:

(35) L radical   H radical

      a nsǀ lɔ́ɔ́ʔ jʊ̀ 'he will take   a nsǀ yə̂n jʊ̀ 'he will see it'
      1   2 32 3   it'   1   2 3   4

      a bə lɔ́ɔ́ʔ jʊ̀ 'while he took   a bə yə̂n jʊ̀   'while he saw it...'
      1 1 32 3   it...'   1 1 3   4

(35)(cont.)

    L radical   H radical

    |oó? jú   'take it'   yən jú   'see it'
    21   2   1   2

This indicates that Bamileke speakers must in some way relate the added
tone of the radical to the vocalic release.

    In one of the recorded texts I found the following sentence:

(36)   fingalóó mə ná? mvɑɗ wəó yằ ?
       2 2 12 2 1   12 21 n

       'ring I had given you where'
       (Where is the ring I had given you?)

A relative phrase in Bangangte-Bamileke is preceded by a relative concord,
in this case /zə̀/, and followed by a demonstrative element /lá/. The
preceding sentence would be elicited as :

(37)   fingaló zə́ mə ná? mvɑɗ wə lá yằ ?
       2 2 1 2 2 1   12 2 1 n

Sentence (36) is regarded by the informant as just a shortened version
of (37) with deletion of the segmental content of /zə̀/ and /lá/, but
with the tones preserved. Bamileke speakers seem able to handle such
floating tones with semantic content.

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AN OBSERVATION OF VOWEL CONTRACTION IN XHOSA[1]

Paul K. Aoki
Department of Linguistics
University of Washington

1. Introduction

In this paper, I will examine the phonetic nature of vowel contraction in the Bantu language, Xhosa, and the implication of this phonological process for generative phonology. I will present arguments in an attempt to constrain phonological theory. Specifically, I will argue against the use of transformational rules to account for vowel contraction as a unitary process.

In the literature concerning Xhosa (e.g. Jordan [1966]; McLaren [1936]; and Riordan et al. [1969]) a phonological process called vowel contraction or vowel coalescence is described. Since Xhosa does not tolerate two contiguous vowels in one syllable (i.e. syllables tend to conform to C_0^3V patterns rather than C_0^3VV patterns), two juxtaposed vowels, the first of which is neither [+high] nor [+back], appear to coalesce or contract to form one unique third vowel.

Implicit in the notion of vowel contraction is that two phonological processes are taking place. While one of the vowels is modified in at least one of its distinctive features (i.e. vowel height), the other of the two vowels is deleted, e.g. ai > e or au > o. What is significant about the notion of vowel contraction is that Chomsky and Halle [1968: 360] have proposed the need to use so-called transformational rules to account for an example of vowel contraction from Kasem, a Niger-Congo language. Transformational rules typically have two segments to the left of the arrow, e.g. AB $\rightarrow$ CD or AB $\rightarrow$ C, rather than the standard type of rule with one segment to the left of the arrow, e.g. A $\rightarrow$ B/__C, which they did not attempt to use in describing Kasem vowel contraction. I will show that the use of transformational rules to formalize vowel contraction for the data presented by Chomsky and

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Halle [1968:358-64] is superfluous in that the standard type of rule can adequately describe the data. The alternative analysis which I will propose for the Kasem data will show that transformational rules are a less explicit notational variant of standard type rules. The standard type rules will be more explicit in non-arbitrarily showing which vowel is modified and which is deleted. In addition, the standard type of rule will claim that the notion of vowel contraction is actually composed of two independent processes.

I will then show that not only may the notion of vowel contraction in Xhosa be viewed as being composed of two distinct processes, but also must be recognized as two distinct processes independent of the notion of vowel contraction as a unitary process in order to make another generalization in Xhosa. In this case, transformational rules cannot be a notational variant of standard rules. By recognizing vowel contraction as two processes, i.e. vowel lowering and vowel deletion, and by having another phonological rule apply between these two processes, not only does the nature of vowel contraction become more explicit, but we also maintain a more constrained phonological theory by eliminating transformational rules as a possible formal device in describing vowel contraction.

2. Transformational Rules

Before examining Xhosa phonology, let us first review the formal mechanism (i.e. transformational rules) used to describe vowel contraction, in light of the data from which it was first proposed.

Only when the given formal mechanisms within a framework cannot descriptively account for a certain phenomenon is an amendment made to that framework. In general, when an extension is to be made to the grammar, the burden of proof lies with the proponents of that extension to demonstrate that a body of data cannot be handled given the existing formal mechanisms. In the Kasem problem presented by Chomsky and Halle [1968:358-64](henceforth CH), it might be assumed that the standard rules with one segment to the left of the arrow (henceforth O[ne] S[egment] rules) were inadequate to handle the data, i.e. given OS rules, we could not account for simple vowel alternations. In order to

adequately describe some of the phonology concerning vowels, CH propose
a transformational rule (henceforth T[wo] S[egment] rules), to account
for vowel contraction.

Let us quickly review the Kasem data and the relevant phonological
rules. Assuming, as CH do, that the vowel system appearing in the trans-
cription consists of two high vowels i and u and three low vowels æ,
a and ɔ [1968:358], and further, that æ is [-back], a and ɔ are
[+back], u and ɔ are [+round], and æ and a are [-round], let us
observe the following data:

(1) | Singular | Plural | Gloss |
|---|---|---|
| bakada | bakadi | boy |
| fana | fani | knife |

The final a is the singular morpheme and the final i is the
plural morpheme. Now consider the following:

(2) | Singular | Plural | Gloss |
|---|---|---|
| kambia | kambi | cooking pot |
| pia | pi | yam |
| buga | bwi | river |
| diga | di | room |
| laŋa | læ | song |
| pia | pæ | sheep |
| nanǰua | nanǰwæ | fly |
| yua | ywæ | hair |
| kɔga | kwæ | back |

Assuming that (with the exception of 'sheep', 'fly', 'hair', and
'back', for which CH posit /pia/, /nanǰau/, /yau/, and /kaug/ respec-
tively as underlying forms (cf. 361-2)) the underlying forms of the noun
stems are found in the columns marked 'Singular' minus the final a , CH
propose the following set of ordered rules[2], to account for the last
three nouns in the second set of singulars, and all of the nouns in the

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[2]There is one additional rule of nasalization which applies before
velar elision. This rule, however, does not affect the present discussion.

second set of plurals.

(3) a. Velar Elision:

$$\begin{bmatrix} +cns \\ -ant \\ -cor \end{bmatrix} \rightarrow \emptyset / \_\_ \begin{bmatrix} +voc \\ -cns \\ -back \end{bmatrix}$$

(velars $\rightarrow \emptyset/\_\_$ i)

  b. Metathesis:[3]

S.D. $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$, [-cns] , $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$

        1   2   3

S.C. 1 2 3 $\rightarrow$ 2 1 3, except when 2=3= a

        (iai $\rightarrow$ aii; aui $\rightarrow$ uai)

  c. Truncation:

$$\begin{bmatrix} -cns \\ \alpha high \\ \beta back \end{bmatrix} \rightarrow \emptyset / \_\_ \begin{bmatrix} +voc \\ -cns \\ \alpha high \\ \beta back \end{bmatrix}$$

(aa $\rightarrow$ a; ii $\rightarrow$ i)

  d. Vowel Contraction:

S.D. $\begin{bmatrix} +voc \\ -cns \\ -high \\ +back \\ -rnd \end{bmatrix}$, $\begin{bmatrix} -cns \\ +high \\ \alpha back \end{bmatrix}$

            1   2

S.C. 1 2 $\rightarrow$ $\begin{bmatrix} 1 \\ \alpha back \\ \alpha rnd \end{bmatrix}$, $\begin{bmatrix} 2 \\ \emptyset \end{bmatrix}$

(ai $\rightarrow$ æ; au $\rightarrow$ ɔ)

  e. Glide Rule:[4]

$$\begin{bmatrix} -cns \\ +high \end{bmatrix} \rightarrow [-voc] / \_\_ \begin{bmatrix} +voc \\ -cns \end{bmatrix}$$

(u $\rightarrow$ w/__V)

Typical derivations are given in (4) below:

---

[3]Although metathesis has the format of a transformational rule, i.e. with more than one segment to the left of the arrow, it is not my present purpose to argue against the use of TS rules for metathesis. This paper is concerned only with vowel contraction.

[4]CH note that the glide rule does not apply before the singular suffix /a/. Thus we have forms such as pia 'yams'.

(4)

Rule	/pi+i/	/bug+i/	/pia+i/	/yau+i/	/kaug+i/
(3a)	---	bu+i	---	---	---
(3b)	---	---	pai+i	yua+i	---
(3c)	p+i	---	pa+i	---	---
(3d)	---	---	pæ	yuæ	kɔg+a
(3e)	---	bwi	---	ywæ	---
	[pi]	[bwi]	[pæ]	[ywæ]	[kɔga]

Notice that vowel contraction, in Kasem, appears to involve two simultaneous processes: the creation of a new vowel composed of features from each of the original two vowels and the reduction of two segments to one. It would therefore be appealing to devise some formal mechanism allowing the claim to be made that the two processes are in fact one process since the two always appear to be associated. This is precisely what CH have done.

Rule 3 states that a sequence of two vowels, the first of which is [+low], is contracted into a third unique vowel. This third vowel keeps the lowness of the first vowel and the backness and roundness of the second vowel, i.e. ai > æ and au > ɔ. In this type of rule there is an inherent arbitrariness as to which vowel is deleted. The rule could just as easily have been written as:

(5)   S.D. $\begin{bmatrix} +voc \\ -cns \\ -high \\ +back \\ -rnd \end{bmatrix}$, $\begin{bmatrix} -cns \\ +high \end{bmatrix}$

                    1   2

        S.C.   1 2 → $\begin{bmatrix} 1 \\ \emptyset \end{bmatrix}$, $\begin{bmatrix} 2 \\ -high \end{bmatrix}$

Given the two possibilities to formally describe vowel contraction, the theory then could claim that which of the two vowels is deleted and which undergoes feature modification is irrelevant. One could decide on a formal convention saying that it would always be the first vowel to be deleted and always be the second vowel which would undergo vowel modification; but this decision itself would be arbitrary. Whether or

not one chooses a formal convention to delete the first vowel, an un-
justified empriical claim is made, namely that it is the first vowel and
not the second which would be deleted and that it is the second vowel
and not the first which is modified. The formal apparatus, however,
appears to be correct in claiming that the vowel change in feature and
vowel deletion are both part of the same process.

One alternative to this dilemma is to formulate a rule like the
following:

(6) a.   S.D. $\begin{bmatrix} +voc \\ -cns \\ -high \\ +back \\ -rnd \end{bmatrix}$, $\begin{bmatrix} -cns \\ +high \\ \alpha back \\ \alpha rnd \end{bmatrix}$

                    1   2

         S.C.   1 2 → $\begin{bmatrix} 1 \\ \emptyset \end{bmatrix}$ $\begin{bmatrix} 2 \\ \emptyset \end{bmatrix}$ $\begin{bmatrix} 3 \\ +voc \\ -cns \\ -high \\ \alpha back \\ \alpha rnd \end{bmatrix}$

or   b.   S.C.   1 2 → $\begin{bmatrix} 1 \\ \emptyset \end{bmatrix}$ $\begin{bmatrix} +voc \\ -cns \\ -high \\ \alpha back \\ \alpha rnd \end{bmatrix}$ $\begin{bmatrix} 2 \\ \emptyset \end{bmatrix}$

or   c.   S.C.   1 2 → $\begin{bmatrix} +voc \\ -cns \\ -high \\ \alpha back \\ \alpha rnd \end{bmatrix}$ $\begin{bmatrix} 1 \\ \emptyset \end{bmatrix}$ $\begin{bmatrix} 2 \\ \emptyset \end{bmatrix}$

Such an alternative makes the same claim that the original TS rule
makes, i.e. that there is a change of vowel features and that deletion
is involved. What makes this alternative appealing is that it does not
make a claim as to which vowel is modified and which is deleted. It
makes the additional claim that the vowels contract to form a new third
vowel which is composed of features of the original two vowels, yet it
makes no claim that one vowel is more dominant in the sense that one
vowel takes the pertinent features from the other while the less dominant
vowel is deleted.

Recall that the truncation rule (3c) reduces vowel sequences of
aa > a   and   ii > i.   It does not appear that we have evidence to favor
the deletion of one of the identical vowels over the other. CH could
have written the truncation rule as a TS rule such as (7) or (8).

(7)   S.D. $\begin{bmatrix} \text{+voc} \\ \text{--cns} \\ \alpha\text{high} \\ \beta\text{back} \end{bmatrix}$, $\begin{bmatrix} \text{+voc} \\ \text{--cns} \\ \alpha\text{high} \\ \beta\text{back} \end{bmatrix}$

                  1   2

      S.C.   1 2 $\rightarrow$ $\begin{bmatrix} 1 \\ \alpha\text{high} \\ \beta\text{back} \end{bmatrix}$, $\begin{bmatrix} 2 \\ \emptyset \end{bmatrix}$

or

(8)   S.D. $\begin{bmatrix} \text{+voc} \\ \text{--cns} \\ \alpha\text{high} \\ \beta\text{back} \end{bmatrix}$, $\begin{bmatrix} \text{+voc} \\ \text{--cns} \\ \alpha\text{high} \\ \beta\text{back} \end{bmatrix}$

                  1   2

      S.C.   1 2 $\rightarrow$ $\begin{bmatrix} 1 \\ \emptyset \end{bmatrix}$, $\begin{bmatrix} 2 \\ \alpha\text{high} \\ \beta\text{back} \end{bmatrix}$

Actually, the truncation rule (3c) written as an OS rule could also
just as easily have deleted the second, rather than the first identical
vowel. Rule (9), as follows, is equivalent to rule (3c).

(9) $\begin{bmatrix} \text{+voc} \\ \text{--cns} \\ \alpha\text{high} \\ \beta\text{back} \end{bmatrix}$ $\rightarrow$ $\emptyset$/ $\begin{bmatrix} \text{+voc} \\ \text{--cns} \\ \alpha\text{high} \\ \beta\text{back} \end{bmatrix}$ ——

The truncation rule could have been written as rules (3c, 7, 8, or
9). In other words, since we do not know if it is the first or the
second vowel which is being deleted, we can describe truncation as one
of two possible OS rules, i.e. rule (3c) or (9), or as one of two pos-
sible TS rules, i.e. rule (7) or (8). Since vowel contraction contains
a truncation rule, it follows that vowel contraction should be expressible
as one of two possible (pairs of) OS rules (i.e. vowel height modifica-
tion, and trucation or deletion) or as one of two possible TS rules.

Since we have already observed the two possible TS rules, i.e. rules
(3d) and (5), let us look at the two possible pairs of OS rules which
describe vowel contraction in Kasem.

(10) a.
$$
\begin{bmatrix} +voc \\ -cns \\ -high \\ +back \\ -rnd \end{bmatrix} \rightarrow \begin{bmatrix} \alpha back \\ \alpha rnd \end{bmatrix} / \underline{\quad} \begin{bmatrix} -cns \\ +high \\ \alpha back \end{bmatrix}
$$

   (ai → æi; au → ɔu)

   b.
$$
\begin{bmatrix} +voc \\ -cns \end{bmatrix} \rightarrow \emptyset / V\underline{\quad}
$$

   (æi → æ; ɔu → ɔ)

(11) a.
$$
\begin{bmatrix} +voc \\ -cns \\ +high \end{bmatrix} \rightarrow [-high] / \begin{bmatrix} +voc \\ -cns \\ -high \\ +back \\ -rnd \end{bmatrix} \underline{\quad}
$$

   (ai → aæ; au → aɔ)

   b.
$$
\begin{bmatrix} +voc \\ -cns \end{bmatrix} \rightarrow \emptyset / \underline{\quad}V
$$

   (aæ → æ; aɔ → ɔ)

Rule (10a) changes the backness and roundness of the first of two
vowels in a sequence to the backness and roundness of the second vowel
if the first vowel is a and the second vowel is i or u. Rule (10b)
then deletes the i or u vowel.

Rule (11a) makes i or u [-high] if it follows a, i.e. there is
a partial height assimilation of i or u to the height of a. Rule
(11b) then deletes a.

The original vowel contraction, rule (3d), then, is descriptively
equivalent to rules (5, 10 and 11). In other words rules (3d, 5, 10 and
11) are notational variants of each other. Likewise rules (3c, 7, 8 and
9) are notational variants of each other. Given the original five rules
(3a-e) used to describe some of Kasem phonology, we then have sixteen
different possible grammars, e.g. rules (3a, 3b, 3c, 3d, 3e); rules (3a,
3b, 7, 3d, 3e); rules (3a, 3b, 3c, 5, 3e); rules (3a, 3b, 7, 5, 3e); etc.
Out of these sixteen possible grammars, can we choose one to be simpler

than the rest in the sense of expressing generalizations which the other cannot?

Suppose we choose a grammar consisting of rules (3a, 3b, 9, 10 and 3e), truncation (9) must precede vowel contraction (10) as follows:

(9)
$$
\begin{bmatrix} -\text{cns} \\ \alpha\text{high} \\ \beta\text{back} \end{bmatrix} \rightarrow \emptyset\ / \begin{bmatrix} +\text{voc} \\ -\text{cns} \\ \alpha\text{high} \\ \beta\text{back} \end{bmatrix} \underline{}
$$

(aa → a; ii → i)

(10) a.
$$
\begin{bmatrix} +\text{voc} \\ -\text{cns} \\ -\text{high} \\ +\text{back} \\ -\text{rnd} \end{bmatrix} \rightarrow \begin{bmatrix} \alpha\text{back} \\ \alpha\text{rnd} \end{bmatrix} / \underline{} \begin{bmatrix} -\text{cns} \\ +\text{high} \\ \alpha\text{back} \end{bmatrix}
$$

(ai → æi; au → ɔu)

b.
$$
\begin{bmatrix} +\text{voc} \\ -\text{cns} \end{bmatrix} \rightarrow \emptyset\ /\ V\underline{}
$$

(æi → æ ɔu → ɔ)

Notice that rules (9) and (10b) are very similar in that they are both truncation rules. It would be notationally convenient if we could collapse these two rules. This would be possible if rule (10a) were not ordered between them. We could then make the claim that there is really only one vowel truncation rule.

At the end of the discussion concerning the Kasem data (p. 364), CH inadvertently reordered truncation and vowel contraction when they listed the final order of rules (cf. p. 364 and example 93 on p. 361), i.e. the final order of rules is: 1 - velar elision, 2 - metathesis, 3 - vowel contraction, 4 - truncation, and 5 - glide rule. This inadvertent re-ordering raises a question. If the vowel contraction rule contains a truncation rule, e.g. rule (10b), is it not redundant to state another truncation rule (9) immediately after vowel contraction, assuming such an ordering is possible?

In other words, our grammar would have the following order: rules (3a, 3b, 10, 9, 3e). Rule (9), a truncation rule, would follow rule (10b) another truncation rule. The redundancy exists because we now have two truncation rules, one ordered immediately after the other. We have

probably missed a generalization concerning vowel deletion in Kasem.

By reformulating, i.e. collapsing, the truncation rule (9) and the truncation rule (10b) of the vowel contraction rule (10) as follows in (12), it will be possible not only to order truncation after vowel contraction (actually vowel height assimilation), but we will use an OS rather than a TS rule to formalize vowel contraction.

(12) Truncation:
$$
\begin{bmatrix} +voc \\ -cns \\ \alpha back \\ \beta rnd \end{bmatrix} \rightarrow \emptyset \; / \begin{bmatrix} +voc \\ \alpha back \\ \beta rnd \end{bmatrix} \underline{\quad}
$$

(13) Vowel Assimilation:
$$
\begin{bmatrix} +voc \\ -cns \\ -high \\ +back \\ -rnd \end{bmatrix} \rightarrow \begin{bmatrix} \alpha back \\ \alpha rnd \end{bmatrix} \; / \underline{\quad} \begin{bmatrix} -cns \\ +high \\ \alpha back \end{bmatrix}
$$

By reordering the reformulated rules with velar elision, metathesis, and glide formation, we have the following derivations:

(14) | Rule | /pi+i/ | /bug+i/ | /pia+i/ | /yau+i/ | /kaug+a/ |
|------|--------|---------|---------|---------|----------|
| Velar elision (3a) | --- | bu+i | --- | --- | --- |
| Metathesis (3b) | --- | --- | pai+i | yua+i | --- |
| Vowel assimilation(13) | --- | --- | pæi+i | yuæ+i | kɔug+a |
| Truncation (12) | pi | --- | pæ | yuæ | kɔg+a |
| Glide formation (3e) | --- | bwi | --- | ywæ | --- |
| | [pi] | [bwi] | [pæ] | [ywæ] | [kɔga] |

In the derivation of pæ 'sheep', the truncation rule will have to apply iteratively right-to-left (cf. Jensen and Jensen [1973]). In other words, the truncation rule (12) claims that the vowel immediately to the left of the rightmost vowel in a sequence causes the deletion of the rightmost vowel.

We have now captured two generalizations which the other fifteen grammars did not. First we claim that there is only one truncation rule. Second, we claim that truncation, or vowel deletion, occurs in a right-to-left direction iteratively, i.e. the rightmost vowel is deleted by the vowel immediately to its left.

In view of the fact that one of the purposes of linguistic theory is to restrict the domain of possible grammars, before accepting an extension (in this case the addition of a TS rule to account for vowel contraction), it must first be demonstrated that standard OS rules are inadequate in descriptively accounting for the data. Not only can OS rules easily account for vowel contraction in Kasem, but the internal nature of these rules makes explicit which vowel is modified and which is deleted.

Assuming that TS rules are not or at least were not intended to be a notational variant of OS rules and assuming also the possibility that CH knew that OS rules could account for vowel contraction, then perhaps CH proposed TS rules to better attain a level of explanatory adequacy in accounting for vowel contraction. In other words, given the early observations on many African languages, especially of Bantu, descriptive linguists recorded what appeared to be the single coalescence process of two juxtaposed vowels, e.g. ai > e or au > o. As this notion of vowel contraction became known, CH may have felt obligated to incorporate some formalism, i.e. TS rules, to account for the linguist's intuition that when two vowels of some languages are juxtaposed, there is a single phonological process which merges or contracts the two vowels into a third vowel.

A very possible reason which may have led many observers of language to the notion of vowel contraction as a unitary process is that they observed only the obvious and transparent cases of vowel processes in language. I have demonstrated that when we investigate other phonological processes, vowel contraction should be viewed as being composed of two separate processes in order to capture other phonological generalizations and such generalizations can only be captured by OS rules.

3. Vowel Contraction in Xhosa

I will now present some examples from Xhosa which could also lead one to the notion of vowel contraction as a unitary process. However, in light of additional data, I will demonstrate that the notion of vowel contraction must be viewed as two independent phonological processes expressed as OS rules in order to obtain a clearer and deeper understanding of the nature of Xhosa phonology.

I will assume that Xhosa has an underlying system of five vowels:

(15)

	−back	+back
high	i	u
	e	o
low		a

For our purposes, I will also consider these five vowels to be phonetic vowels.

In Xhosa, as in Kasem, there is a similar phenomenon of vowel contraction, i.e. given two vowels, they coalesce and form not a lengthened or double vowel, but a short single vowel segment. In some vowel combinations, it is not clear which vowel has undergone a feature modification and which vowel has been deleted, as seen in (16):

(16) a. a + a > a   /wa + aβa + ntu/   [waβantu]   for the people

                  /aβa + akhi/   [aβakhi]   builders

   b. a + i > e   /wa + inkosi/   [wenkosi]   of the chiefs

                  /na + impendulo/   [nempendulo]   with the answer

   c. a + u > o   /wa + umfazi/   [womfazi]   of the woman

                  /na + um + ntu/   [nomntu]   with the person

In example (16a) there is no evidence to argue whether it is the first or the second a which is deleted. Likewise, in examples (16b) and (16c) we do not know whether it is a or the [+high] vowels which delete. In addition, we have no evidence to know if it is a that becomes [−low] and [αback] or if i and u become [−high].

At a first glance, a TS rule would appear to be desirable since up to this point, vowel contraction appears to be taking place as a unitary process. At this point, we really have no justification to posit two OS rules to explain what appears to be a unitary process. We must now investigate a precise formulation of the Xhosa vowel contraction rule which utilizes a TS rule.

In order for a rule to account for the following vowel contractions: aa > a, ai > e, and au > o, the rule would have the following format:

(17)   S.D. $\begin{bmatrix} +\text{voc} \\ -\text{cns} \\ \langle +\text{low} \rangle \end{bmatrix}$, $\begin{bmatrix} +\text{voc} \\ -\text{cns} \\ \langle -\text{low} \rangle \\ \alpha\text{back} \end{bmatrix}$

                   1   2

    S.C.   1 2 $\rightarrow$ $\begin{bmatrix} 1 \\ -\text{low} \\ \alpha\text{back} \end{bmatrix}$, $\begin{bmatrix} 2 \\ \emptyset \end{bmatrix}$

The use of the angled brackets has been employed to keep cases of aa from becoming o. Notice, however, that rule (17) is actually collapsed from two distinct rules—presumably to capture a generalization. Since the angled bracket notation is an abbreviation of two rules, rule (17) represents the following ordered rules:

(18) a.   S.D. $\begin{bmatrix} +\text{voc} \\ -\text{cns} \\ +\text{low} \end{bmatrix}$, $\begin{bmatrix} +\text{voc} \\ -\text{cns} \\ -\text{low} \\ \alpha\text{back} \end{bmatrix}$

                     1   2

      S.C.   1 2 $\rightarrow$ $\begin{bmatrix} 1 \\ -\text{low} \\ \alpha\text{back} \end{bmatrix}$, $\begin{bmatrix} 2 \\ \emptyset \end{bmatrix}$

           (to account for cases like ai $\rightarrow$ e and au $\rightarrow$ o)

    b.   S.D. $\begin{bmatrix} +\text{voc} \\ -\text{cns} \end{bmatrix}$, $\begin{bmatrix} +\text{voc} \\ -\text{cns} \\ \alpha\text{back} \end{bmatrix}$

                     1   2

      S.C.   1 2 $\rightarrow$ $\begin{bmatrix} 1 \\ \alpha\text{back} \end{bmatrix}$, $\begin{bmatrix} 2 \\ \emptyset \end{bmatrix}$

          (to account for cases of aa $\rightarrow$ a)

Rule (17) looks somewhat suspicious in the sense that both a's are [+back] and it is actually redundant to utilize alpha notation. Rule (17) simply states that after the application of rule (18a), of any two contiguous vowels, the second one is deleted. But that is exactly what the following two OS rules claim.

(19)   V $\rightarrow$ $\begin{bmatrix} -\text{low} \\ \alpha\text{back} \end{bmatrix}$/___ $\begin{bmatrix} +\text{voc} \\ -\text{cns} \\ +\text{high} \\ \alpha\text{back} \end{bmatrix}$

(20)   V → ∅ / V___

In Xhosa, are TS rules simply complex notational variants of OS
rules? Perhaps TS rules are not notational variants of OS rules. We
could advance this position if we reformulate rule (17) into rule (21).
Since TS rules involving vowel contraction arbitrarily choose which
vowel to delete, rather than to delete the second vowel as in rule (17),
let us delete the first vowel as in rule (21).

(21)   S.D. $\begin{bmatrix} +voc \\ -cns \\ +low \end{bmatrix}$, $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$

              1   2

       S.C.   1 2 → $\begin{bmatrix} 1 \\ \emptyset \end{bmatrix}$, $\begin{bmatrix} 2 \\ -high \end{bmatrix}$

Rule (21) is a simplified version of rule (17) in the sense of having
fewer feature specifications, and the angled brackets are eliminated. It
states the first vowel elides rather than the second. Rule (21) states
what the two sub-rules of (17) state as well as the following two ordered
OS rules:

(22) $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$ → [-high]/ $\begin{bmatrix} +voc \\ -cns \\ -high \end{bmatrix}$ ___

(23) $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$ → ∅ /___ $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$

In answering now the question of whether TS rules are simply notational
variants of OS rules, let us consider more data:

(24) a. a + e > e /wa + eyele/   [weyele]   'he fell in'
                     /aɓa + enzi/   [aɓenzi]   'doers'

      b. a + o > o /aɓa + oni/   [aɓoni]   'wrong doers'
                     /ba + oja/   [boja]   'they roast'

We now have five instances of two contiguous vowels contracting into
one: a + a > a, a + e > e, a + o > o, a + i > e, a + u > o. We note
that only in the last two of the five cases does the second vowel undergo
a feature change. In other words, in three of the five cases, it appears

as though we simply have a deletion of the first of two vowels and only in the last two cases (cf. examples (16b) and (16c)) do we have genuine cases of feature modification of vowels in addition to vowel deletion.

As was mentioned earlier, in the case of rule (17), the alpha notation was needed to insure the deletion of one of the two a 's and not change the remaining a to [-low]. The contraction of a 's was only one of what appeared to be three legitimate cases of vowel contraction (examples (16a - c)).

Observe the following examples:

(25) a. $\begin{Bmatrix} a \\ e \\ o \end{Bmatrix}$ $\begin{Bmatrix} a \\ e \\ o \end{Bmatrix}$

(25) a. $\begin{Bmatrix} a \\ e \\ o \end{Bmatrix}$ $\begin{Bmatrix} a \\ e \\ o \end{Bmatrix}$

(25) a. $\left\{\begin{matrix} a \\ e \\ o \end{matrix}\right\}$ /ndi + akha/   [ndakha]   'I build'
      b. i +   e   >   e   /ni + enza/   [nenza]   'you make'
      c.   o   o   /ni + oʼja/   [noʼja]   'you roast'

We now have additional cases of two contiguous vowels where the first of two vowels deletes. Rule (21) should be able to account for these cases but i is [+high] and not [+low] as the structural description requires. It appears that we can eliminate the feature [+low] from the structural description and simplify rule (21) into rule (26):

(26)   S.D. $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$, $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$

                 1   2

       S.C.   1 2 → $\begin{bmatrix} 1 \\ \emptyset \end{bmatrix}$, $\begin{bmatrix} 2 \\ -high \end{bmatrix}$

It appears now that we have captured a significant generalization in Xhosa phonology. Actually we have obscured any generalization that we might have had. That is, by eliminating the feature [+low] from the structural description, the structural change states that if the second of two contiguous vowels is [+high], it is accidental that the [+high] vowel becomes [-high]; the rule, then, claims that it is not a case of vowel lowering by influence of a which is [+low] and [-high].

Moreover, is it not strange that only two of eight cases, namely the vowels i and u, undergo any feature modification, and that in the remaining six cases, there is only vowel deletion? In other words, is it not strange that rule (26) says: "in case the second of two contiguous

vowels is [+high], in addition to deleting the first vowel, make the
second vowel [-high]--otherwise just delete the first vowel." More in-
tuitively, one would expect that we have two cases of vowel lowering and
eight cases of vowel deletion. If this is true, then TS rules are actual-
ly obscuring significant generalizations concerning the nature of vowel
contraction, i.e. we really have cases of vowel lowering and vowel
deletion.

Another inadequacy of rule (26) is that we have what appear to be
counter-examples. Examine the following:[5]

(27) a. u + i > wi   /umntu + ini/   [emntwini]   'person' (locative)
                       /isisu + ini/   [esiswini]   'stomach'   "
      b. o + i > we   /isilo + ini/   [esilweni]   'animal'   "
                       /uβuso + ini/   [uβusweni]   'face'   "

The non-low ([+round, +back]) vowels become glides and do not delete.
We could prevent the deletion of u and o by stating in the structural
description of rule (26) that the first vowel must be [-round]. The
addition of the feature [-round] only prevents u and o from being
deleted. We still must formulate a rule which would convert the round
back vowels into glides, i.e. a glide formation rule:

(28) $\begin{bmatrix} +voc \\ -cns \\ +rnd \end{bmatrix} \longrightarrow \begin{bmatrix} -voc \\ +high \end{bmatrix} / \underline{\hspace{1em}} \begin{bmatrix} +voc \\ -cns \end{bmatrix}$

By creating such a rule and ordering it before rule (26), we eliminate
the need for adding the feature [-round] to the structural description of
the first vowel. Rule (28) would bleed, or eliminate, u and o as
inputs to rule (26). To attempt the converse would be to add to the com-
plexity of rule (26) and therefore make it less general and less highly
valued. Ordering (28) after (26) would force the addition of [-round]
to the structural description of (26) in order to exempt examples of u
and o which must undergo glide formation.

_____
[5]The change of the word initial vowel is a replacement of the subject
classifier by the locative classifier, i.e. a morphosyntactic change.

We have a problem. Clearly the glide formation rule must precede rule
(26). If it follows (26), there would be no back round vowels to be
converted into glides (unless, of course, we choose ad hocly to include
[-round] in the structural description). But by changing the back round
vowels to glides, we change the [+voc] feature of these segments to
[-voc]. This change poses no problem for the examples in (27a), but in
(27b) we notice that i becomes e. Rule (26) now cannot change the
feature of [+high] to [-high] for the vowel i since we no longer have
a [+voc] segment preceding i. Even if we would allow a glide, namely
w, to meet the structural description, the rule would claim that i
becomes e because of the preceding [+high] glide.

One possible solution would be to assume that there are two w glides,
one [+high] and the other [-high]. The [-high] glide would cause the
vowel i to become [-high]. A later rule would convert all [-high]
glides to [+high] glides, i.e. absolutely neutralize (cf. Kiparsky [1968])
the phonetic contrast between the two glides. However, there is no
motivation for such a solution unless one is attempting to salvage TS
rules, namely rule (26).

The real solution lies in the OS rules, precisely rules (22) and (23)
in conjunction with rule (28), which must follow (22) and precede (23).
By using these three ordered rules, we can account for the data presented
in examples (16), (24), (25) and (27).

(29) a. Rule (22) $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$ $\rightarrow$ [-high]/ $\begin{bmatrix} +voc \\ -cns \\ -high \end{bmatrix}$ ___ (Vowel Lowering)

b. Rule (28) $\begin{bmatrix} +voc \\ -cns \\ +rnd \end{bmatrix}$ $\rightarrow$ [-voc] /___ $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$ (Glide Formation)

c. Rule (23) $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$ $\rightarrow$ $\emptyset$ /___ $\begin{bmatrix} +voc \\ -cns \end{bmatrix}$ (Vowel Deletion)

Rule (22) will only lower [+high] vowels if they follow [-high] vowels.
It claims that there is a partial assimilation of vowel height to the
height of the preceding vowel. Rule (28) will convert u and o into
the glide w if it appears before a vowel, and rule (23) then deletes

the first of any two contiguous vowels.

The following are typical derivations:

(30) Rule   /wa + umfazi/   /isisu + ini/   /isilo + ini/

    (22) (VL)   wa + omfazi   ---   isilo + eni

    (28) (GF)   ---   isiw + ini   isilw + eni

    (23) (VD)   w + omfazi   ---   ---

            [womfazi]   [esiwini][6]   [esilweni][7]

By using OS rules, i.e. rules (22) and (23), our grammar forces us to make our description of vowel contraction more explicit than a grammar that employs TS rules. The grammar using OS rules is forced on internal grounds to claim which vowel is modified and which vowel is deleted. In the case of a grammar using TS rules, we were free to choose which vowel to modify and which to delete. Because of rule (28), the glide formation rule, we are forced to view the notion of vowel contraction as two independent processes. We have constrained the number of possibile grammars for Xhosa by eliminating the use of TS rules to account for vowel contraction as a unitary process.

4. Conclusion

By excluding TS rules as a possible description of vowel contraction, there are certain implications for both diachronic and synchronic grammars. First, for diachronic descriptions, the use of OS rules allows us to claim that vowel contraction took place in at least two distinct historical stages. Secondly, we could account for the possibility of there being two dialects which differ solely on the basis of reverse ordering of the two OS rules of vowel contraction.

For synchronic descriptions, TS rules are also not allowed as a possible description of vowel contraction. Even if there are no rules which intervene between the vowel modification rule and the vowel truncation or deletion rule, TS rules cannot be allowed as an acceptable formal description. Although transformational rules may exist for syntactic operations

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[6]Cf. footnote 5.

[7]Cf. footnote 5.

in the mind of the native speaker, they cannot exist in the mind of the
native speaker as part of the phonology to account for vowel contraction.

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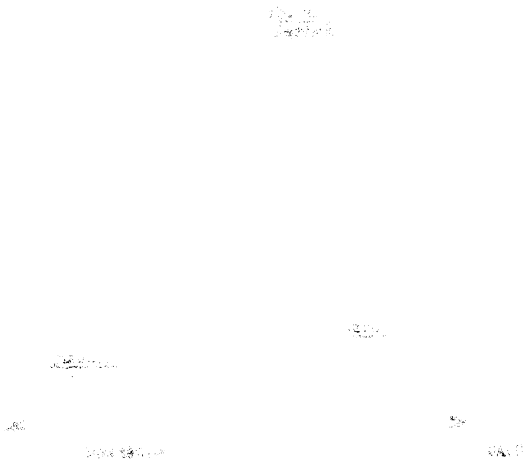
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[1] The language/group in question is indicated when this is not obvious from the title of the paper.

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