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EDITORIAL NOTE

The editorial board of Studies in African Linguistics has discussed, in its last meeting, the future editorship of the journal. Mr. Givón has indicated his intention to step down as editor at the end of the current year. The board has elected Mr. Larry Hyman to be the next editor of the journal. Mr. Hyman has accepted.

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CASE COMPLEXES IN SWAHILI[1]

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1. Introduction

In any study of those Swahili sentences whose surface structure is a realization of [V(NP_a, NP_b...)], it is soon apparent that observed patterns are co-variant with the particular items occurring both at V and NP.

For example, the choice of a particular V, whether as a simple or as an extended form,[2] involves constraints not only on the choice of concomitant nominals, but also on acceptable combinations. Thus:

(1a) mtoto alivunja dirisha lile 'Child broke window that'

(2a) mtoto alikufa 'Child died'

(3a) mtoto alifika nyumbani 'Child arrived at-house'

where -vunj- will accept an entailment[3] but -f- will not. Thus:

(1b) dirisha lile lilivunjwa na mtoto 'Window that was-broken by child'

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[1]I owe a particular debt of gratitude to my chief informant at the time of writing, Sh. Y. Omar of Mombasa, as well as to those others who have enlightened me in the past, especially Miss Salma Mbaye of Zanzibar, and Mr. John Mganga of Korogwe, Tanzania.

I should also like to acknowledge the value of comments made on the earlier draft by Mr. J. J. Christie, Dr. J. H. Carter, Dr. J. E. Maw, Dr. N. V. Smith and Dr. Talmy Givón.

[2]I define a simple form of the verb as one which cannot be further contracted [see Whiteley 1968:56]. Such forms will be abbreviated in this paper as V_s, and extended forms as V_e.

Particular extended forms will be abbreviated thus: V_{-O} (oblique extension), V_{-C} (causative extension).

[3]The term 'entailment' is used to designate the potentiality for transposition of certain lexical items which stand in a surfact subject and object relationship [Whiteley 1968:10; 1969:108]. Sentences which stand in an entailment relationship to one another may be inferred from one another, but the precise semantic relationship between them is neither constant nor, in all cases, straight-forward.

Equally the V of (1a) may differ from that of (1x) by extension:

(1x) mtoto alivunjika mguu 'Child was-broken leg'

which will accept (1y) as an entailment:

(1y) mguu wake mtoto alivunjika 'leg his child was-broken'

Any theory that is proposed for Swahili, therefore, must not only generate realizations such as (1a), but must also account for those like (2a) and (3a), together with their potentialities for entailment. As a starting point for this study I adopt the view of "...how much more instructive it can be to study small problems under powerful magnification than to try to take in great heaps of phenomena in sweeping surveys" [Weinreich 1969: 26]. It is evident that in a language like English such problems can be viewed against a solid background of documentation such as is lacking for Swahili, where there is a growing tendency to use surface data only in so far as they demonstrate that this or that theoretical point is well motivated. This can only lead to premature generalizations. By an intensive examination of surface data for one sentence type from this Bantu language, I hope not only to expose the variety of features which must be accounted for in any theoretical formulation, but to demonstrate the usefulness of certain heuristic devices in ordering this data.

An initial question is whether these surface realizations of intra-sentential relationships are correlatable with discoverable semantic properties of verbs which can be listed in the lexical component of the grammar. If this were to prove possible one would like to see if the correlation can be extended to intra-sentential relationships associated with extended forms of these verbs, which would be preferable to regarding the extensions as new base-stems, each with its own distinctive semantic/syntactic features. Even if this were to be possible, there still remains the question of the relationship between what might be termed a 'deep' structure of Swahili and any universal deep structure which might be set up. This is an area which has become fashionable in recent years, and an approach which has attracted considerable attention is that of Fillmore. In his now celebrated "The Case for Case" he asserts: "The case notions

comprise a set of universal, probably innate, concepts which identify certain types of judgments human beings are capable of making about the events that are going on around them, judgments about such matters as who did it, who it happened to, and what got changed" [Fillmore 1968:24]. An approach to intra-sentential relationships in terms of case seems to offer an attractive means of categorizing verbs, yet it is not without its difficulties for those working on languages other than their own first language. For example, the assignment of particular case labels seems to depend on the intuition of the individual speaker/hearer and leaves large areas for equivocal allocation.[4] Again it is not always easy to be sure at what level these case notions are held to apply: they have a universal quality but they are yet immediately applicable to the surface phenomena cited. On the other hand, with some modifications a case-type approach does seem to be feasible within the general framework of a re-statement grammar which seeks to classify intra-sentential relationships as functions of the semantic properties of verbs.

2. Complexes of simple verbs

To return to examples (1a) and (1b), it must be noted that these two sentences are members of a set which also includes the following focused constructions:

(1c)	alivunja dirisha mtoto yule	'This child broke the window'
(1d)	dirisha alivunja mtoto yule	'This child broke the window'
(1e)	ndiye mtoto yule aliyevunja dirisha	'It's this child who broke the window'
(1f)	ndilo dirisha alilovunja mtoto yule	'It's the window that this child broke'

All of these may be said to constitute a linear re-ordering of (1a), while (1b) constitutes rather a restructuring of (1a). All, however, may be located along a scale of focus,[5] in which either NP_1 or NP_2 is given

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[4]Some of the weaknesses in the case approach have been discussed by Huddleston [1970:501-511] and Dougherty [1970:506-531].

[5]The term focus is used for those formal devices e.g. intonation, sequence, etc., which strengthen the choices actually made of a particular item, in contrast to others not made. There is, thus, in my view a real

prominence, indicated by underlining. NP_1 of (1a) is accorded minimal prominence in (1b), but maximal prominence in (1f). The set as a whole is termed a focus-set. Fillmore would, I believe, allocate to such verbs as -vunj- the case frame (_A,O), which provides for an animate A(gentive) and an inanimate O(bjective). There is, however, something to be gained by conflating the two relationships (NP_1 + V) and (V + NP_2) into a single case-complex, in which it is the total relationship that is being emphasized rather than the individual case relationship. The complex subsumes two capacities; that for structural re-statement and that for linear re-ordering, both of these being expounded semantically by variations in focus. The capacity for re-statement obviates the need for making arbitrary decisions about particular case relationships, though the central role of the verb is still underlined. Thus relationships of the kind exemplified by (1a)-(1f) may be given the label D(irective) and would be entered in the lexical component of the grammar under the appropriate verb, along with such information relating to NP_1 and NP_2 as can be codified. Thus both the following are labelled <u>D-complexes</u>:

(4) mtoto alivunja dirisha 'Child broke window'

(5) jiwe lilivunja dirisha 'Stone broke window'

since both accept comparable re-statements. The fact that instrumental phrases may freely occur if NP_1 is animate but not otherwise is attributable to the fact that -vunj- implies deliberate rather than accidental breaking, and even where an inanimate NP_1 occurs with an instrumental phrase there is still a feeling that some purposive action took place:

(6) gari lilivunja mti wa simu kwa bampa
'A car broke the lamp-standard with its fender'

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difference in meaning between, for example (1a) and (1b), but this is of a different order from that between, say, (1a) and another sentence mzee alivunja dirisha lile 'The elder broke that window' (Cf. Halliday [1968:204ff] and, more forcefully, Chafe [1971:11]). Focus may be paradigmatic, in which an item is typically contrasted with other material outside the unit under consideration. This contrast may be retrospective, i.e. referring to material already presented, or prospective, i.e. referring to material not yet presented.

Verbs which participate in D-complexes will be labelled D-verbs.

A verb such as -f-, of example (2), however, belongs to a shorter focus-set, there being no restructuring comparable to that of (1b), in fact no NP_2 occurs, thus:

(2a) mtoto alikufa 'Child died'
mtoto wake alikufa 'Child his died'
(2c) alikufa mtoto wake 'His child died'
(2e) ndiye mtoto wake aliyekufa 'It's his child who died'

Such complexes may be labelled S(tative).

Finally, there is a large group of verbs which accept a locative as NP_2. Thus:

(3a) mtoto alifika nyumbani 'Child arrived at-house'
mtoto alikwenda mjini 'Child went to-town'

for which a focus-set comparable in length to that for D-verbs is available. However, it must be stressed that the semantic relationship between (3a)/(3b) is not comparable to that between (1a)/(1b). The realization of NP_1 in (3a) is marked relative to its occurrence in (3b), which consequently cannot occur if NP_1 is, as it were, marked intrinsically, e.g. by being a Proper Name:[6]

(3b) nyumbani kulifika mtoto 'To-the-house came some child'
*nyumbani kulifika Juma 'To-the-house came Juma'

Such complexes are labelled L-complexes and verbs participating in them L-verbs. All Swahili verbs so far encountered can have allocated to them one of these complex labels, but this represents a gross simplification of the actual situation for two reasons.

Firstly, the complex itself is an abstraction, at a level intermediate between observed data and that of the 'universal' deep structure, whether this is formalized by $[V(NP_1, NP_2...)]$ or by the Fillmorean (M + P) format. Thus the observed data may be said to realize the complexes subject to certain conditions:

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[6]Sentences of a similar type are discussed in greater detail in Roberts [1971:62].

(i) The actual occurrence of NP_1 may be correlated, among other factors with whether the utterance occurs in discourse-initial or discourse-medial position;

(ii) Structural re-statements may be more acceptable for some verbs -- and for some speakers -- than for others;

(iii) While an object-prefix (op) is a potentiality for any D-complex, the rules for its realization have not been formulated;

(iv) The status of NP_2, both within a complex and across complexes, varies widely, being obligatory in some cases but not in others.[7]

Thus in the example:

(6a) mgeni wetu amekuja 'Guest our has come'

it is not clear to a reader who is not also a student of Swahili whether one is dealing with an S-complex in which NP_2 cannot occur, or an L-complex in which NP_2 is not realized. This can only be resolved intuitively, empirically, or by reference to the lexicon. It is an important point, however, since there is evidence of what might be termed a 'scale of obligatoriness' in respect of the co-occurrence of particular items or small series of items it may be most convenient to recognize 'phraseological units' (see Weinreich [1969:42]). But apart from such cases, there is still a wide range of variation. Towards one end of the scale are two types of verb: firstly, those which themselves adequately instantiate the activity they designate e.g., -lim- 'cultivate', -chung- 'herd', -za- 'give birth', -chez- 'play', -nyw- 'drink' (negative only); and secondly, those which, when no NP_2 occurs, instantiate some special variety of the activity they designate, e.g. -l- 'eat', -shon- 'sew', -on- 'see' (possessing the faculty of sight), -siki- 'hear' (possessing the faculty of hearing). The NP_2 in most of these cases could be said to be immanent. Thus:

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[7]This is a point which has received scant attention in the Bantu field, but it is briefly referred to in Harries [1970:15-18].

(7) anafanya nini? anakula tu

'What is he doing? He's eating' (meal (ugali, wali) as opposed to relish (kitoweo))

(8) anashona,

'He's sewing' (clothes as opposed to shoes or hats, etc.)

Thus in addition to noting the complex-affiliation of a particular verb, it will be necessary to stipulate some co-occurrence restrictions in the lexical component. Towards the other end of the scale are those verbs which require complementing, typically verbs of hitting, breaking, throwing, destroying, etc. [Fillmore 1970:120-133; Halliday 1970:155-155].

Secondly, while it may be possible to demonstrate statistically that the three complexes listed above are in some sense the major complexes, they are not, as will be shown below, the only ones, and many verbs -- probably a majority -- will accept several. Thus, what started as a simple trichotomy rapidly develops into a complex mosaic as different parameters are recognized, and the problems raised become increasingly difficult to handle in general terms as each new idiosyncrasy is uncovered.

The three complexes will now be examined in much greater detail.

a. S-verbs. In the foregoing discussion the verb -f- was classed as an S-verb on the basis of example (2a)-(2c), yet a difficulty arises when it is recognized that -f- will also participate in an L-complex:

(9) mtoto wake alikufa mijini 'His child died in town'
mjini kumekufa mtoto wake 'In the town his child died'

Should one now regard example (2a) an an example of an L-complex in which NP_2 was not realized, or should one say that -f- will participate in two different complexes? There are arguments in favour of both solutions, but I favour the latter on the grounds that the pattern in which NP_2 is not realized is far more common than that in which NP_2 is a locative, and it would seem unsatisfactory for the commoner pattern to be a realization of the less common. The verb -f- will also associate with a small number of NP_2's (e.g. ndui 'smallpox', njaa 'hunger') for which an instrumental phrase may be substituted.

Amongst those verbs which, on present evidence, will only accept an S-complex[8] are the following:

(9a) -ch- 'dawn', -ku- 'mature, become adult', -pw- 'ebb' (of the tide), -pe- 'mature', -fung- (b) 'fast'[9]

In a similar manner a substantial number of S-verbs will also participate in a complex in which NP_1 is animate, and semantically related to NP_2 as whole to part. Though in a majority of cases the part may constitute an inalienable possession of the whole, this is not the fact that is being stressed. This complex will be labelled R(eferential) and verbs so designated in the lexical component of the grammar will be found typically to designate physical or mental states. Two entailments occur with this verb type, as in (10) below, of which the first is isomorphic with a D-complex pattern like (1a), except that here the object-prefix is obligatory while in the D-complex it is optional. The focus-set is comparable in length to that for D-complexes, though (1d) has not been noted:

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[8]This assertion must be understood against the background of the informants used. In my experience there are at least three major positions adopted by native speakers of Swahili:

(i) Ready acceptance of a form plus an ability to contextualize freely.

(ii) Dubious acceptance of a form as possible without the ability to contextualize.

(iii) Rejection of a form as not occurring.

Needless to say, one may, even from a single informant, demonstrate the occurrence of a rejected form, since forms may be rejected not as forms but as contexts for particular lexical items, but these seem to be the main stances taken up. I am operating from the first, but other informants might well provide evidence for other groupings. I would expect the complex-distribution to be more idiosyncratic than the semantic generalizations it is possible to reach by means of it.

[9]The glosses are intended as no more than identification devices.

(10) mzee yule amechakaa mwili 'Old man that is-worn out body' (focus on the fact that the old man is worn out)

mwili umemchakaa mzee yule 'The body is-worn out (on) that old man' (focus here on the body)

mwili wa mzee yule umechakaa 'The body of that old man is-worn out' (focus here on the body)

Amongst the verbs which will accept this complex are the following:

(10a) -chaka- 'become worn out', -duduk- 'be disfigured', -changamk- 'be cheerful', -chok- 'become tired'.

In one or two cases the meaning of the verb in the entailment differs rather markedly. Thus:

(11) mtu huyu anatetema mkono 'This man's arm is quivering (as a result of disease)'

mkono unamtetema mtu huyu 'This man's arm is itching (to hit someone)'

As will be noted below a similar complex obtains for L-verbs.

b. D-verbs. A small number of these verbs -- perhaps two dozen in all -- [Whiteley 1968:20] will also accept an S-complex. Thus:

(12a) mke wangu amefunga mlango 'My wife has closed the door'

(12b) D-complex: mlango umefungwa na mke wangu 'The door has been closed by my wife'

(12c) S-complex: mlango umefunga 'The door is closed'

This is very close to the classical ergative pattern, but its occurrence is restricted, apparently, to the -me- 'perfective' and to the -ta- 'future' forms, and in both cases potentiality is stressed. Thus it is not the fact that the door is closed that is being stressed so much as the potentiality of the door for closing properly that is being realized. The distinction of meaning involved here might be regarded as a function of 'stativizing' this D-verb, rather than as evidence for the existence of two homonymous verbs. The difficulties of fixing the boundaries between such verbs is demonstrably rather difficult [Bolinger 1971: 522-529], and the assertion of homonymy diverts attention from the overall affinity between the verbs involved. Stativization, concomitantly with

restrictions on nominal choice is relevant for the classification of a number of verbs, e.g. -fung- 'fast', -fung- 'be constipated', etc.

A second group of verbs accepts the entailment of the C(ontrastive) complex and is treated in detail below. This pattern is associated with marked retrospective focus [Whiteley and Mganga 1970:110-113], so the focus set of this complex is thereby lengthened. No complete list of verbs accepting this pattern has yet been worked out for any informant, but there is a high degree of variability in acceptance:

(13) shamba hili limelima watu ishirini
'This farm has taken twenty men to cultivate it' (reference to preceding comment on its size)

It has often been pointed out that the grammatical subject of a passive sentence is also its psychological subject (or topic). In this pattern, then, the relationship between the grammatical subject and the verb is counter-experiential, i.e. counter to one's experience of the real world.

Finally, a number of verbs will accept an L-complex, with a locative at NP_2 (as well as at NP_3, for which see below). Thus:

(14) Wanawake wanalima bondeni 'Women are cultivating in the valley'
bondeni kunalima Wanawake 'The valley is cultivated (by) women'
bondeni kunalimwa na Wanawake 'The valley is cultivated (by) women'

This latter entailment seems the commoner of the two with D-verbs.

There does not seem to be a clear division between those verbs which will, and those which will not, accept such a complex, but rather a gradual shift from those for which it is characteristic, e.g. verbs of cultivating, eating, drinking, etc. to those for which it is unusual or strained, e.g. verbs of hitting, breaking, fastening, etc.

In D-complexes NP_1 is typically animate and NP_2 typically inanimate, but this is perhaps no more than a statement about the central pattern. It should be noted, however, that where NP_1 is inanimate and NP_2 animate, there are frequently two possible patterns in the entailment. Thus:

(15) risasi ilimpiga mtoto aliyesimama karibu
'A bullet hit a child who was standing nearby'

(15a) mtoto aliyesimama karibu alipigwa kwa risasi

'A child standing nearby was hit by a bullet' (on purpose)

(15b) mtoto aliyesimama karibu alipigwa na risasi

'A child standing nearby was hit by a bullet' (accidentally)

Thic contrast between purposive/accidental action has been noted above.

c. L-verbs. Reference was made above to the C(ontrastive) complex, the entailment of which is accepted by a number of D-verbs. All L-verbs so far encountered will also accept the C-complex as additional members of their focus-set. Thus:

(16) mtoto alifika nyumba (ile) 'Child arrived at house (previously mentioned)'

nyumba ile ilifika mtoto 'That was the house the child arrived at' (so look for it there)

It will be apparent that C_a and D_a[10] below are isomorphic, being distinguishable only in terms of focus level. Thus:

(16a) C_a mtoto alifika nyumba (ile) 'Child arrived at house (that)' (focus is essentially retrospective)

(1) D_a mtoto alivunja dirisha lile 'Child broke window that' (the window is now being mentioned for the first time)

The particular level of focus characterized by C_a above for L-verbs is, for D-verbs, signalled by (1c) (see section 2 above), and the feature of contra-experientiality in the entailment is much less marked for L-verbs than for the D-verbs previously mentioned. On the other hand, there are some L-verbs for which the whole D-complex appears to occur, though with some contrast in meaning such that one might wish to list them separately in the lexical component. Cases like this are:

(17a) D-complex: mtoto aliruka jiwe 'Child jumped over stone'

jiwe lilirukwa na mtoto 'The stone was jumped over by the child'

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[10]The subscripts $_a$ and $_e$ are used to identify the base member (example (1a)) and the entailed member (example (1b)) of a focus-set.

(17b) L-complex: mtoto aliruka jiweni 'Child jumped from/to stone'

jiweni kuliruka mtoto 'The stone was jumped-to/from (by) the child'

(17c) C-complex: mtoto aliruka jiwe lile 'Child jumped onto that stone' (having been told not to)

jiwe lile liliruka mtoto 'That was the stone the child jumped over' (if you want to take some action about it)

Note also:

(17d) -kimbi- mjini 'Run out of town'

-kimbi- mji 'Keep away from town'

In its entailment with L-verbs, however, the C-complex raises a difficulty. While the entailments of other complexes are each associated with a particular focal feature which can be stated for the complex as a whole, the focus of the contrastive entailment, while clearly on NP_1, seems also to be associated in some cases with variations in the meaning of the verb, so that no satisfactory general statement is yet possible. In these patterns there are, it is evident, restrictions on the occurrence of particular items at both NP_1 and NP_2, on the occurrence of the demonstrative in association with NP_1, and on the tense/aspect markers of the verb. To simplify the presentation all examples are first cited in the -me- tense. Consider the following:

(18) sahani (ile) imetambaa jongoo 'That dish has had a millipede walk over it' (and hence it must be cleaned)

(19) njia (ile) imesimama watu 'That street is blocked with people' (as opposed to C_a where people are merely standing in it)

(20) nyumba ile imekaa wageni 'That house has guests staying in it' (so there is no point in looking for a room there)

(21) nyumba imefika wageni wengi 'The house has many guests in it' (so there is no point in our going in)

(22) shamba hili limemea mihindi 'This farm has grown maize' (the soil being more suitable than for, say, millet)

(23) bahari hii imezama meli 'This stretch of water has sunk ships' (it has a bad reputation)

(24) daraja hili limepita tembo 'This bridge has taken an elephant' (is strong enough)

(25) nyumba hii imelala watu kumi 'This house has slept ten people'

(26) shamba hili limeingia mbega 'This farm has monkeys on it'

In the complexes that have been previously considered, one might say that, in some sense, the verb articulates the relationship between NP_1 and NP_2. In the examples cited above, however, (V + NP_2) appears to have an attributive function in relation to NP_1, which is captured in an English gloss to (22) above, thus, 'this is a maize-growing farm'. In almost all cases, however, one can infer from the sentence some quality of NP_1 which is responsible for such an attribute, thus in (18) the dish has perhaps something sticky on it, or has been in a place where such insects are known, and in (26) one could infer that the farm was badly placed and was liable to get monkeys marauding on it. The element of potentiality recurs in other tenses. Thus with the -a- tense, examples (19)-(21) and (26) will connote habituity to my chief informant [Sh. Y. Omar], while (22)-(25) will connote potentiality. Examples (18) and (24), by contrast connoted both habituity and potentiality in the -a- tense. The -ta- tense is equally interesting: it was not acceptable for examples such as (20) and (21), while in all the other examples there emerges a 'resultative' connotation:

(18) sahani ile itatambaa jongoo 'That dish will have a centipede crawl over it' (as you're so stupid to leave it there)

(26) daraja hili litapita tembo 'This bridge will take an elephant' (since you have built it so substantially)

Much further work remains to be done here.

Finally, as was noted above, for S-verbs, a number of L-verbs will accept an R-complex. But while the R-complex associated with S-verbs is typically marked in the entailment of an animate NP_1 and an obligatory

object-prefix in the verb, R-complexes associated with L-verbs are typically marked in the entailment by the non-occurrence of an object-prefix and by a minimal distinction of meaning between the two members of the focus-set. Thus:

(27) nchi imeenea maji 'The country is covered with water'
maji yameenea nchi 'The water covers the country'

(28) watu wametanda uwanja mzima 'People have completely covered the whole courtyard'
uwanja mzima umetanda watu 'The whole courtyard is covered with people'

On the other hand, one might argue that the difference between this form of R-complex and that operating for S-verbs, together with the minimal difference in meaning, constituted evidence for thinking that this was not an R- but a C-complex in which the element of contrast in the entailment is minimal. While the evidence is inconclusive at this stage, there is some support for the R-complex view from patterns in the causative extension, see further below.

The complexes and combinations outlined above exemplify the simplest patterns. That is, S-verbs are essentially monadic in their ability to combine with a single NP (as surface subject), while D-verbs and L-verbs are essentially dyadic.

d. Extended patterns. Complications may be introduced by the occurrence of NP_3 (or NP_4). No comprehensive list is yet available of those verbs which will accept such an NP, but typically they appear to be D-verbs. At least four groups are clearly discernable:

(i) In some D-verbs NP_2 is a beneficiary, while NP_3 is the benefice. There appears to be only one case of a simple verb in which an NP_3 of this kind occurs obligatorily, -p- 'give', as in:

(29) watu walimpa Rais zawadi 'People gave the President a gift'[11]
Rais alipewa zawadi na watu 'The President was given a gift by (the) people'

[11]It does not seem possible to have inherently benefactive clauses without a beneficiary, as occurs in English, e.g. 'We're giving a silver coffee-pot' [Halliday 1970:150].

There are, however, a number of other verbs where such an NP_3 occurs optionally, e.g. -ambi- 'tell', -lip- 'pay', -fany- 'do', -fung- 'fasten', -l- 'eat':

(30) baba alimfunga tai 'Father tied (his) tie for him'

(31) anamla mwenzake pesa 'He's scrounging money from his friend'

(32) wamemfanya mwalimu jambo 'They've done the teacher a good turn'

All these verbs will be labelled $D_{B(enefactive)}$ which, as will be noted below, is characteristic of the -i-/-e- extension.

There are at least three verbs which can conveniently be treated here, but which are not, perhaps, so obviously 'benefactive' as the above mentioned. These are -pak- 'daub', 'smear', -ti- 'put', 'place', -paki- 'load', as in:

(33) paka mafuta! 'Put on oil/grease!

(34) mama alimpaka mtoto mafuta (mkono) 'Mother put ointment on the child ('s arm)

mtoto alipakwa mafuta (mkono) na mama 'The child ('s arm) was annointed by (the) mother'

In some cases both NP_2 and NP_3 seem to have the status of beneficiaries:

(35) Salma alipaka poda uso mzima 'Salma put powder over her whole face'

poda ilipakwa na Salma uso mzima 'The powder was put by Salma over (her) whole face'

uso mzima ulipakwa poda na Salma 'The entire face was covered with powder by Salma'

As to the verb -ti-:

(36) alitia maji 'He put water (on it)'

(37) alitia maji ndooni 'He put water in the bucket'

(38) alitia maji ndoo 'He sprinkled water on the bucket'

ndoo ilitiwa maji naye 'The bucket was sprinkled-water-on by him'

(38a) Cf. maji yalitiwa ndoo naye 'Bucket was immersed in water by him'

This clearly belongs to a different focus-set, e.g. alitia ndoo majini. On the other hand, if an object-prefix and demonstrative occur, then both

NP_2 and NP_3 have the status of beneficiaries. It is not clear how widespread this phenomenon is:

(38b) aliitia maji ndoo ile 'On that bucket he sprinkled water'

ndoo ile ilitiwa maji naye 'This bucket was sprinkled with water by him'

maji yalitiwa ndoo ile naye 'The water was sprinkled (on) this bucket by him'

It will be noted that for this verb the beneficiary typically occurs as NP_3, in contrast to the other verbs cited. There is some evidence that this is correlated with the fact that neither NP is animate here, which seems also to be contributory factor in the extent to which neither NP may have the status of beneficiary.

As to the verb -paki-:

(39) wafanyikazi walipakia meli mizigo 'Workers loaded ship (with) cargo'

meli ilipakiwa mizigo na wafanyikazi 'The boat was loaded with cargo by the workers'

Here, NP_3 may also have the status of beneficiary, but in this case NP_2 is locativized:

(39a) mizigo ilipakiwa melini na wafanyikazi 'The cargo was loaded on the boat by the workers'

For none of the verbs cited in this section is it yet clear what other members of the focus-set may occur.

(ii) For many, perhaps most, of the D-verbs which will accept an L-complex, a locative NP_3 may occur, thus conflating the D and L complexes:

(40) mamangu afyeka magugu shambani 'Mother clears weeds from the garden'

mamangu afyeka magugu 'Mother clears the weeds'

mamangu afyeka shambani 'Mother clears the field'

In such patterns the entailments of both complexes may occur, but acceptance of other members of the focus-set is difficult to obtain.

As noted above acceptability of an L-complex must be distinguished

from that of an L-phrase,[12] which may be general for all D-verbs.

Complexes accepting this pattern will be labelled D_L.

(iii) A third group of verbs accept an NP_3 which is associated essentially with some limitation or refinement of the information presented by (NP_1 + V + NP_2). This appears to be an extension of the pattern exemplified by the R-complex already set up for S- and L-verbs, but, whereas in those cases it is NP_2 which limits or refines the scope of V, here it is NP_3 which limits NP_2, as is the case with some of the causative verbs to be discussed below.

Typically, as in the simple and benefactive D-complexes, it is NP_2 which is entailed as surface subject, and NP_3 (the NP of 'limitation') which occurs in the entailment as NP_2, but some flexibility in the sequence of NP_2 and NP_3 is apparent. Complexes which will accept this pattern are labelled thus, D_R:

(41) walijenga nyumba vyumba viwili 'They built the house of two rooms' (it being implied that no more are to be built)

nyumba ilijengwa vyumba viwili 'The house was built (as) two rooms'

(42) walijenga vyumba viwili vya nyumba 'They built two rooms of the house' (it being implied that more are to be built)

(43) alitazama gari kioo 'He looked at the car's mirror' (this being a feature of the car)

gari ilitazamwa kioo 'The car was looked-at (at) the mirror'

(44) alitazama kioo cha gari 'He looked at the car's mirror' (not perhaps attached to any car, but simply an accessory)

(45) alitazama gari kwa kioo 'He looked at the car with a mirror'

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[12]The distinction might be more clearly brought out by stressing that the former is a sentence-locative while the latter is simply a verbal complement.

(46) nilimshika mwizi shati 'I caught the thief by his shirt'

(47) nilishika shati ya mwizi 'I caught the thief's shirt' (but not the thief inside it)

(48) nilimshika mwizi kwa shati 'I caught the thief with (the aid of) a shirt'

(49) mfunge mwizi kamba 'Fasten the thief with rope (tie him up with it)'

(50) mfunge mwizi kwa kamba 'Fasten the thief with rope (to something else)'

(51) namchukia Ali maneno yake 'I dislike Ali on account of his words' (but it is only his words I dislike)

(52) namchukia Ali kwa maneno yake 'I dislike Ali on account of his words' (they are what makes me dislike him)

(53) buibui amekitanda hariri chumba kizima 'A spider has woven a web over the whole room'

chumba kizima kimetandwa hariri na buibui 'The whole room was-woven-a web-over by the spider'

With a verb like -pig- a number of difficulties arise, and in any detailed study one would need to consider whether to set up 'phraseological units' for such units as -pig- pasi 'iron', -pig- mbio 'run', -pig- teke 'kick', etc.:

(54) nilimpiga mtu kichwa 'I hit the man with my head'

(55) nilimpiga mtu fimbo ya kichwa 'I hit the man a blow on the head'

(56) nilimpiga mtu kwa kichwa 'I hit the man with a head (of something, using it as an instrument)'

On the other hand:

(56a) nilimpiga mwizi jiwe/risasi 'I hit the thief by throwing a stone at him/by firing at him'

cannot easily be handled in this way, especially since there is no necessary implication of actually hitting him. It might be preferable here simply to list -pig- jiwe 'throw a stone at', -pig- risasi 'fire at'.

(iv) The most common of these patterns is that in which a part/whole relationship obtains between two NP's, the inalienable quality of the relationship being conventionally rather than universally conceived. Complexes accepting such patterns will be labelled with a subscript P(artitive)·

Relationship of NP_1 to NP_3:

(57) baba amenificha siri yake 'Father kept his secret from me'
nimefichwa siri yake na baba 'I was kept-his-secret-from by father'

As with the other NP_3 patterns (-ti- excepted) it is NP_2 (the 'whole') which is entailed as NP_1, and NP_3 (the 'part') which is entailed as NP_2.

Relationship of NP_1 to NP_2:

(58) kichwa kinamfuka mama moto 'Mother's head is hot' (i.e. she has a high fever)
kichwa chake (mama) kinafuka moto 'Mother's head is hot'

Since -fuk- is an S-verb the first of these examples looks like an R_P-complex but no entailment occurs, only the variant second sentence. It is not certain whether any other verbs follow this pattern.

Relationship of NP_2 to NP_3:

Of the three this is by far the most widespread pattern, occurring for a wide range of verbs with a D pattern among their complexes, as also for some S- and L-verbs. NP_2 is typically animate and is entailed as NP_1:

(59) niiimvunja mwenzangu mguu 'I broke my pal's leg'
niiimvunja menzangu maneno yake 'I contradicted my pal's words'

(60) niiivunja meza miguu miwili 'I broke two of the table's legs'

It could be argued, I think, that this is an example of a D_R-complex (as discussed above) rather than a D_P-complex, since what appears to be

stressed here is that the table was broken by having two of its legs broken, and not the relationship of the legs to the table, nor indeed to any table, which would find expression in:

(61) nilivunja miguu miwili ya meza 'I broke two legs of the table'

Similar patterns occur for other verbs of breaking, hitting, damaging, closing, etc., as in:

(62) mtu huyu amemwiba mwenzake maneno 'This chap stole his friend's words'

The series of items which can occur at NP_3 is restricted to immaterial possessions of NP_2, ... e.g. intelligence, opinions, reputation, shadow, etc. All material possessions require an extended verb, as in:

(63) dawa ile ilimpofoa macho 'That medicine deprived him of sight'

(64) mwizi alimpokonya mali 'The thief snatched his property (from him)'

(65) watu wengi walimwona mtu shati yake 'Many people saw (and recognized) him by his shirt'

(66) waliisafisha gari magurudumo 'They cleaned the car's wheels'

This example might be interpreted as a D_R-complex.

All the above examples operate as D-complexes, with NP_2 (the 'whole') being entailed as NP_1.

Such patterns also occur for S- and L-verbs:

(67) majasho yaliwalowa watoto mashati yao 'Sweat soaked the children's shirts'

watoto walilowa majasho mashati yao 'The children had their shirts soaked with sweat'

(68) mtoto alikauka macho machozi 'The child had his eyes dry of tears'

macho yalimkauka mtoto machozi 'The child's eyes were dried of tears'

The above entailment, however, is anomalous for complexes with L-verbs, and it is not clear how widespread such an anomaly is. Note also:

(69) kichwa chake kizima kimeenea mvi 'His whole head is covered with white hairs'

mvi zimemwenea kichwa kizima 'White hair covers (his) entire head'

Before discussing the complexes associated with extended verbs, it is worth summarizing the complex-data that will need to be incorporated into the lexical component, by considering two verbs in detail.

-ingi- 'enter'

L-complex [NP_1(+anim)] ('enter, go in'):

(70) watu waliingia nyumbani 'People entered the house'

nyumbani kuliingia watu 'Into the house entered people'

(71) watu waliingia vumbini 'People entered a dusty area'

(Vid. C-complex below)

C-complex:

(72) watu waliingia nyumba ile 'People entered that house (one previously referred to)'

nyumba ile iliingia watu 'That was the house people went into' (substantial number of people implied)

D-$complex_1$ [NP_1(+anim), V(+op)]:

(73) watu walilliingia vumbi 'People went into a dusty place'

vumbi lilliingiwa na watu 'The dusty-place was entered by people'

For some speakers, an added variant pattern

(73a) vumbi liliwaingia watu 'The dusty-place was entered by people'

occurs which is characteristic of R-complexes, though there is skewing in the R_a pattern.

D-$complex_2$ [NP_1(+anim), V(+op)] ('penetrate, infiltrate'):

(74) Wakikuyu wameuingia mji huu 'The Kikuyu have infiltrated this town'

D-$complex_3$ [NP_2(+anim), V(+op)] ('afflict'):

(75) ugonjwa ulimwingia mzee 'Illness afflicted the old man'

R-complex [NP_1(±anim), NP_2(-anim)] ('become covered with'):

(76) watu wameingia vumbi 'People are covered with dust'
vumbi limeingia watu 'Dust covered the people'

(77) wadudu wameingia sukari 'The insects are covered with sugar'
sukari imeingia wadudu 'Sugar covered the insects'

While informants from Dar es Salaam and Zanzibar accepted this complex without demur, it was not acceptable to the informant from Mombasa, who maintained that:

(77a) sukari imeingia wadudu 'The sugar was infested with insects'

could only mean that the insects had contaminated the sugar so as to make it unfit for use, and the two sentences in (77) above are not related by entailment at all, but were comparable to such pairs as:

(78) fimbo yangu imevunja kiti 'My stick has broken the stool'

(79) kiti kimevunja fimbo yangu 'The stool has broken my stick'

for which the appropriate entailments, this being a D-verb, are:

(78a) kiti kimevunjwa na fimbo yangu 'The stool was broken by my stick'

(79a) fimbo yangu imevunjwa na kiti 'My stick was broken by the stool'

The position is well illustrated by the following two examples:

(80) sumu imeingia maji 'Poison is impregnated with water (and hence diluted)'
maji yameingia sumu 'Water is contaminated with poison (and hence undrinkable)

(81) kiti kimeingia mkojo 'The chair is impregnated with piss'
*mkojo umeingia kiti

In none of the examples accepted by the informant from Mombasa was any entailment accepted, so that one must regard each sentence as a R_a in a focus-set of which it is the only member.

-tok- 'go out, come out, leave'

L-complex:

(82) mtu ametoka chumbani 'A person has left the room'

chumbani kumetoka mtu 'Someone has come out of the room' (quite unexpected, you thought the room was empty)

(83) moshi unatoka nyumbani 'Smoke is coming from the house' (from a kitchen fire, stove, etc.)

nyumbani kunatoka moshi 'From the house smoke is coming' (implying that the house is on fire)

D-complex$_1$ [NP$_1$ limited to a series of items designating extrusions, especially involuntary, from the natural orifices of the body, e.g. jasho 'sweat', pele 'pimples, damu za pua 'bleeding from nose', mkojo 'urine', mate 'spittle', shuzi 'flatulence', mavi 'excreta', ute 'dribble': [NP$_2$(+anim, + human), V(+op)]:

(84) jasho lamtoka mtu 'The man is sweating' ('Sweat comes from the man')

mtu atokwa na jasho 'He is pouring (with) sweat'

D-complex$_2$ [NP$_2$(+anim)] (there is here a sense of the event being beyond the control of NP$_2$):

(85) neno limemtoka mtu 'A word slipped out of him'

mtu ametokwa na neno 'He had a word slip out (of him)'

(86) chumba kimemtoka mtu 'The room slipped from his grasp' (he lost it)

mtu ametokwa na chumba 'He lost the room'

(87) mume amemtoka mkewe 'The husband left his wife'

(88) roho yamtoka mzee 'Life is ebbing out of the old man' (see below)

(89) huyu amemtoka mwenziwe 'This chap has pulled away from his pal (in a race)'

D-complex$_3$ [NP$_2$(+anim), V(+op)] ('stick out, protrude'):

(90) vifupa vinamtoka maskini 'The bones are sticking out of the poor chap'

maskini anatokwa na vifupa 'The poor chap has his bones sticking out of him'

(91) (D_e only) mtu huyu ametokwa na jino 'This chap has a protruding tooth'

(Here NP_2 limited to series of protrudable parts of the body, e.g. shingo 'neck', masikio 'ears', ulimi 'tongue'.)

R-complex [NP_2 limited to an extremely short series of items designating abnormal extrusions from the natural orifices, e.g. damu 'blood', usaha 'pus', machozi 'tears']:

(92) mtu ametoka damu 'The man is bleeding'
damu imemtoka mtu 'Blood is coming out of him'

R_a only. [NP_2 restricted to excisable parts of the body, e.g. jino 'tooth', mguu 'leg', mkono 'arm']:

(93) mtu ametoka jino 'He's lost a tooth'

C-complex:

In C_a the relationship of NP_1 to NP_2 is that of contained: container, or component: whole, as in:

(94) shoka limetoka kipini 'The axe has come out of the haft'

(95) pombe imetoka chupa hii 'The beer has come from this bottle'

(96) pombe yatoka mnazi huu 'The beer comes from this palm tree'

(97) maji yametoka ndoo hii 'The water comes from this bucket'

(98) maji yatoka mfereji huu 'The water comes from this tap'

(99) vitabu vimetoka kabati hili 'The books come from this cupboard'

In C_e the relationship is not easy to define and in some cases the pattern does not occur at all (e.g. *(95), *(97)):

(94a) kipini kimetoka shoka 'The handle comes from (i.e. belongs to) the axe'

(96a) mnazi huu watoka pombe 'This palm tree still yields beer'

(98a) mfereji huu watoka maji 'This is a water-producing tap'

(99a) kabati hili limetoka vitabu 'This cupboard yields books' (discovered accidentally)

There are some cases in which C_e occurs but not C_a. Thus:

(100) kiambaza kimetoka nyufa 'The wall has come out in cracks'
*nyufa zimetoka kiambaza hiki

The major complexes and combinations accepted by simple verbs are summarized in Appendix 1, below.

3. Complexes of extended verbs

a. The -i-/-e- extension. Verbs characterized by this extension have been variously referred to in the standard literature as 'applied', 'directive' or 'prepositional' [Aston 1944; Loogman 1965; Polome 1967; Sacleux 1909] and most writers have recognized the very wide range of meanings associated with them. They have, however, been handled generally on morphological grounds, with little attempt to treat the syntax of such extensions. At least four areas of meaning can be distinguished, but it must be recognized that examples can readily be culled from the periphery of each area so that on semantic grounds additional distinctive areas could be proposed:

1. Contrastive: -nuk- 'smell bad', -nuki- 'smell pleasant; -sem- (+op.+anim.) 'speak ill of', -seme- 'speak to'; -chek- (+op.+anim.) 'mock', -cheke- (+op.+anim.) 'be indulgent to'; -tend- (+op.+anim.) 'treat badly', -tende- (+op.+anim.) 'treat well'; -kos- 'commit an error', -kose- 'commit a trivial error'; -on- 'see', -one- 'bear a grudge against'.

On the other hand there is little contrastive in the pairs: -baki 'remain over', -baki- 'remain over'; -um- 'hurt', -umi- 'hurt'; -ngoj- 'wait for', -ngoje- 'wait for'. Speakers may, however, vary in this respect.

2. Benefactive: -let- 'bring', -lete- 'bring for'; -fung- 'close', -fungi- 'close for'; -lim- 'cultivate', -limi- 'cultivate for'.

Again, there is little conformity with the above in the following pairs: -l- 'eat, -li- 'eat someone else's portion of food'; -zib- 'stop up', -zibi- 'stop up against someone'.

3. Locative: -end- 'go', -ende- 'go to' (directional); -kimbi- 'run off', -kimbili- 'run off to', 'run after'; -me- 'sprout', -mele- 'sprout among, in'; -pit- 'pass', -piti- 'pass by'; -geuk- 'turn', -geuki- 'turn towards'.

4. Instrumental: -let- 'bring', -lete- 'bring with (the aid of)'; -on- 'see', -one- 'see with' (e.g. binoculars); -fung- 'fasten', -fungi- 'fasten with, by means of'.

These areas of meaning are associated with characteristic syntactic patterns which may be more or less closely related to those characteristic of the simple verbs. Those extended forms, for example, with contrastive meanings seem generally to accept complexes similar to those for the simple form, and they will not be further discussed here, beyond remarking that it should not be assumed that because an extended form is associated with a contrastive meaning it cannot also be associated with either benefactive or instrumental meanings (see -on- below).

The remaining extended verbs may be described as monadic, dyadic or triadic in their capacity to combine with one, two or three NP's but the role of NP_2 (and NP_3) differs significantly from that of comparable NP's in complexes associated with simple verbs. For example, while there is a wide range of variation in the status of NP_2, its occurrence with extended verbs in benefactive and instrumental complexes appears typically to be obligatory, though there <u>are</u> cases in which NP_2 is optional:

(101) anapitia 'He's passing by'

(102) wanatazamia tu 'They're just looking out'

(103) watakiani? 'What do you want?'

In a very few cases an S-complex can be set up:

(104) mwalimu, Juma anaibia! 'Teacher, Juma's copying!'

What is true for NP_2 also holds for NP_3: in a majority of cases (V_e+NP_2) adequately instantiates the activity designated by V_e, but in others NP_3 is obligatory. This is a characteristic of D-verbs, while (V_e+NP_2) complexes are characteristic of L- and S-verbs. Thus this extension appears

to require the addition of an NP, typically occurring obligatorily, which contributes to the conversion of D-complexes into D_B-complexes; L- and S-complexes into D-complexes, and S-complexes into L-complexes according as the NP is plus or minus locative.

(i) B(enefactive) complexes may be regarded as a variety of D-complex, in the sense that they will accept comparable entailment, but the focus-set to which they belong is much shorter and comprises additionally only (e) and (f) as listed earlier, see Section 1. The following examples are illustrative of the area of meaning involved:

(105) Yohana anamlimia baba shamba 'Yohana is cultivating the plot for his father'

baba analimiwa shamba na Yohana 'Father is having the field cultivated for him by Yohana'

Implicit here is a partial entailment in which NP_3 occurs as surface subject:

(105a) shamba linalimwa (na Yohana) 'The field is cultivated (by Yohana)'

The beneficiary could only be expressed as some form of benefactive phrase:

(106) Mwana amemfia baba baharini 'The child died to his father's bereavement at sea'

baba amefiwa na mwana baharini 'The father was bereaved through the death of his son at sea'

baharini kumekufa Yohana 'In the sea Yohana died'

(107) iletee maji hii meza 'Bring the water for this table (to wash it)'

hii meza iletewe maji 'This table should be brought water'

maji yaletwe 'Water should be brought'

(108) Alimletea mtu zawadi 'He brought a present for the man'

(109) Amewaachia watoto wake mali 'He left his children wealth'

(109a) Nimemwachia mtu lile deni 'I've let the chap off that debt'

(110) Ukinionea kalamu ninunulie 'If you see a pen for me, buy it (for me)'

(111) Amenizibia njia 'He's blocked the path against me'

(112) ...nani yule aliyetufungia mlango... 'Who was it who shut the door on us?'

nenda kanifungie mlango! 'Go and close the door for me!'

(113) Aliwasemea mambo mengi sana 'He said a great deal to them'

(114) Watu wamenijalia nyumba tele 'People have filled the whole house for me' (a complaint against uninvited guests to a funeral party)

(ii) In I(nstrumental) complexes NP_3 precedes both NP_1 and the verb, where there is a concomitant NP_2, and there is no object-prefix associated with either of the NP's.[13] Where no NP_2 occurs NP_3 may either precede the verb and NP_1 or follow them. There appears to be no entailment, and no member of this focus-set has been noted. Such complexes will be labelled $D_{I(nstrumental)}$. Examples are:

(115) ndoo hii aletea maji 'With this bucket, he brings the water'

(115a) ndoo hii mtoto aletea maji 'With this bucket, the child uses for bringing water'

There is clear evidence that in this pattern NP_3 is treated, intonationally at any rate, as in parenthesis.

The following examples illustrate the area of meaning involved. All triadic examples are of verbs whose simple complex inventory includes D; all dyadic examples are of verbs whose simple complex inventory includes L:

(116) kamba ile, nitafungia sanduku 'With that bit of rope I'll fasten the box'

(117) simiti, amezibia nyufa 'With cement he's filled the cracks'

(118) ninaonea mbali miwani hii 'I can see a long way with these glasses'

(119) ... siyaonei hata kidogo 'I don't see with them (eyes) at all'

(This last example (119), from a modern novel [Abdalla 1968], is one of the few counter-examples I have for the statement above about object-prefixes, see footnote 13.)

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[13] There appears to be considerable variation with geographical dialect, some speakers preferring NP_2 in post-verbal position, and not excluding the occurrence of an object-prefix.

(120) chakula watalia sahani hii 'The food they'll eat with this plate'

(121) koti hili natembelea 'In this coat I go out'

(122) twaa kibao ukalie 'Take a bench and sit on it'
kalia kiti kile 'Sit on that chair!'

The fact that D_B or D_I complexes occur for a given verb in no way precludes the co-occurrence of D or L complexes for that extended verb; the former being characteristic of verbs whose simple inventory includes D and L, while the latter occurs only for verbs whose simple inventory contains L or S.

(iii) D-complexes: As noted above an object-prefix is obligatory where NP_2 is animate, but not otherwise. For E-verbs it is difficult to abstract a semantic element in these complexes, possibly they constitute an inchoate new base form. For L-verbs direction 'to/from' is implicit:

D, L-verbs:

-tazam-

(123) watu wanalitazamia gari 'People are looking out for the car'

-ju-

(124) anaijulia (redio) 'He knows (all) about it'

(125) huyu mkali lakini namjulia 'She's sharp-tongued but I know (how to handle her)'

L, C-verbs:

-j-

(126) amenijia 'He has come to me (i.e. to see me)'

-tembe-

(127) mtembelee Juma 'Call on Juma!'

-rudi-

(128) akarudia toza yake 'He returned to the bowl of his pipe [Abdalla 1968]'

-kimbi-

(129) walikimbilia basi 'They ran after the bus'

(130) walimkimbilia mwizi 'They ran after the thief'

but note:

(131) navikimbilia viatu hivi 'I'm after these shoes (in a sale)'

L-complexes: These behave as do L-complexes for simple verbs:

(132) mti umemelea maweni 'The tree has sprouted among stones'

(133) wageni wamefikia nyumbani 'Visitors have come to my house (i.e. to stay)'

A complex-inventory for such extended forms might be established as follows:

-on- (D) 'see'
-one-$_1$ (D) 'bully'
-one-$_2$ (D_B,D_I) 'see for (on behalf of)', 'see with (the aid of)'

-kimbi-$_1$ (L,C) 'run away from'
-kimbili- (D) 'run after'
-kimbi-$_2$ (D) 'keep away from'

-pit- (D,C_e,L) 'pass'
-piti-$_1$ (D -op, NP_2-anim) 'pass by, pass along'
(D +op, NP_2+anim) 'pass into'
(D +op, NP_2±anim) 'pass by (over), neglect'

b. The 'causative' extension. Not all verbs will accept this extension but this is not a fact which can easily be inferred from the 'real world' picture. While one might reasonably argue that a verb like -ch- 'dawn' would be unlikely to accept such an extension, the non-occurrence of the extension for verbs like -let- 'bring', -zib- 'stop up', -j- 'come', -tazam- 'look at', etc. must be regarded as in some way culture-specific.[14]

[14]An interesting study could be made of causatives that have only recently gained currency; thus, -taifish- 'nationalize', (e.g. the banks, etc.) rather than 'grant independent to', which might have occurred given the meaning 'nation' of taifa, and a causative extension.

It must also be pointed out that in Swahili there is evidence that the morphological element labelled 'causative' may represent two different extensions, the one associated with causation, the other with intensification. On semantic grounds therefore, the two would require separate treatment. Consider, for example, the following:

(133a) -ny- 'drip, rain' > -nyesh- 'rain hard'; -ongo- 'guide' > -ongoz- 'lead'; -nyama- 'be silent' > -nyamaz- 'be very quiet'; -ap- 'swear' > -apiz- 'curse at'; -tok- 'come out' > -tokez- 'project'; -siki- 'hear' > -sikiz- 'listen'.

The line between such 'intensives' and what I would call 'causatives' may well be drawn differently: Scotton [1967], for example, includes -sikiz- in her study of causatives, as well as -onyesh-, which I would prefer to treat as a 'double causative'. It must also be borne in mind that, as with the -i-/-e- extension discussed above, some causatives are associated with a contrastive meaning and with complexes characteristic of simple verbs, e.g. -on- 'see', -ony- 'advise', 'reprove'. Finally, there are likely to be a number of special cases which do not fit easily into already established categories, such as -pit- 'pass', -pish- 'let pass' (see also -pitish- below), as in:

(134) njia hii haipishi 'This road is impassable' (but temporarily only, in contrast to haipitiki, which is more permanent)

Where NP_1 is animate this extension will accept a D-complex but not otherwise. It seems best, therefore, to label -pish- with a D-complex and add the proviso that where NP_1 is inanimate then NP_2 is realized as zero. Similarly, with -on- 'see, -ony- 'reflect' (see -ony- above):

(135) Kioo hakionyi 'The mirror doesn't reflect'

Here, one can quite simply accord $-ony-_2$ a special gloss and an S-complex. Next, consider -pend- 'like', -pendez- 'please (someone)':

(136) leso hii yapendeza 'This headscarf pleases'

Superficially this appears similar to -pish- above, but in fact -pendez- will accept a D-complex whether NP_1 is animate or not, and can, therefore,

simply be accorded a D-verb status.

In the discussion that follows, I shall treat as causatives only those forms which are:

(i) characterized by a causative extension,[15] and

(ii) associated with an NP_1 which either directly or indirectly, deliberately or involuntarily effects the state or activity designated by the simple verb. As will be noted below it may not always be the case that success is achieved.

Consider the following examples:

(137) mzee alimchekesha mtoto wangu 'The old man amused my child'

(138) alimfungisha Ali 'She was responsible for Ali's being jailed'

In example (137) NP_1 was directly responsible for making the child laugh, either by telling jokes, pulling faces, etc. In (138), the woman was indirectly responsible for the jailing by her testimony, but perhaps involuntarily. Scotton [1967] makes a clear distinction between the former, with NP_1 as 'director' and the latter, with NP_1 as 'actor', but while the distinction is clear in some cases it is not always so, and the implication of direction is often less appropriate than that of initiation of an action, suggested by Christie [unpublished], who still has to recognize that in the sentence:

(139) aliwavusha watoto wale 'He got the children across (the river)'

both initiation and action may be involved, depending on circumstances, e.g. whether he phoned up the ferry and got someone to take them over, or took them over himself.

It can be argued that in these and other such cases, V_c involves two sets of complexes, the second being implied as a consequence of the first (V_c = causativized verb; V_s = simple verb):

(139a) $NP_1 + V_c + NP_2 + (NP)_3 \supset NP_2 + V_s + (NP)_3$

---

[15]For the shape of this extension see the standard texts, e.g. Ashton [1944].

To return to the examples:

(137)	mzee alimchekesha mtoto wangu 'The old man amused my child'	⊃	mtoto wangu alicheka 'My child laughed/was amused'
(138)	alimfungisha Ali 'He had Ali locked'	⊃	Ali alifungwa 'Ali was locked'
(139)	aliwavusha watoto wale 'He got the children across'	⊃	watoto wale walivuka 'The children crossed'
(140)	alijaza ndoo maji 'He filled bucket water'	⊃	ndoo ilijaa maji 'The bucket was filled with water'

The example (138) is anomalous, with -fungish- designating both 'cause to fasten' and 'cause to be imprisoned'. The simple form of the latter is the passive -fungw- and not the simple form -fung-.

There has been, in recent months, a considerable amount of discussion on the relationships between such pairs as 'become full/fill', 'like/please', etc. which seem to find a counterpart in the causative system of languages such as Swahili. One must recognize, however, that while the implication suggested above will hold for many cases, there are a number where it will not. While, in other words, the process of causation implies success in many cases, in some it does not. One may cause someone to remember something by reminding him, but it does not follow that he will remember, which cannot be said of forgetting. Similarly one can show someone something without their necessarily seeing it. The status of this implication will, therefore, vary.

Returning to the examples above, it is possible to allocate to each extended verb a complex-label which includes as a subscript that of the simple verb in the implication where this is operative. Thus:

(140a) -chekesh- (D_S) 'cause to laugh, amuse'
-fungish-$_2$(D) 'effect the imprisonment of'
-vush- (D_D) 'cause to cross (river), ferry over'
-jaz- (D_R) 'fill, cause to be full'

Again, the complex-labels are ideal statements: the D_D for -vush- indicates that NP_3 may occur, just as in the example for -jaz- NP_3 need not occur. Simple D complexes seem to participate in focus-sets of a length comparable to those for simple verbs, but for D_R the series seems to be restricted to (c), (e) and (f) of the original series (see Section 1, above). Both NP_2 and (in some cases) NP_3 may be entailed as surface subject in the D_D complex, and the focus-set is restricted to (e) and (f) types only.

(i) Verbs with S-complexes in their simple inventory. (No causative patterns have been noted for -ch-, -pw-, -pe- or -fung-(B).)

-ku-/-kuz-(D)

(141) Mungu akukuze! 'May God bless you'

-changmk-/-changamsh-(D)

(142) habari hii itawachangamsha sana 'This news will greatly cheer them up'

-chok-/-chosh-(D)

(143) kazi hii itanichosha 'This job will tire me'

-chokesh-(D)

(144) kalamu hii imenichokesha 'This pen has wearied me'

(ii) Verbs with D-complexes in their simple inventory. (No causative patterns have been noted for -chung-, -finyang-, -ib-, -let-, -on-, -tazam-, -vun-, -vunj-, -zib-.)

-pend-/-pendez-(D) 'please'

(145) msichana huyu anipendeza sana 'This young girl pleases me very much'

-pendez- accepts an R-complex for which there appears to be no parallel in the language beyond its converse -tukish- (Mombasa dialect: St. -chukiz-). Thus:

(146) koti hili lakupendeza 'This coat suits you'

(147) wapendeza kwa koti hili 'You look well in this coat'

(148) koti hili lakutukisha 'This coat doesn't suit you'

-pand-(D,C_e)/-pandish-(D_D,D) 'cause to climb'

(149) mpandishe mtoto mti 'Get the child to climb the tree'

(150) askari aliipandisha bendera 'The soldier raised the flag'

-l-(D,C_e)/-lish-$_1$(D_D) 'feed'

(151) mama amelisha mtoto wali 'Mother has fed her child rice'

-lish-$_2$(D) 'graze (on)'

(152) mchungaji alisha ng'ombe 'The herdsman is grazing the cattle'

(153) ng'ombe walisha majani 'Cattle graze on grass'

-lish-$_3$(S) 'whet the appetite'

(154) achari yalisha sana 'Pickles are great appetizers'

(155) hapa palisha sana 'This is a very attractive place' (used in fishing to describe a good place for finding fish, or by young men of a place where they will find plenty of girls)

-va-(D,C_e)/-vish-(D_D) 'clothe'

(156) mama anamivisha mtoto soksi 'Mother is putting the child's socks on'

-pig-(D,C_e)/-pigish-(D_D) kelele 'cause to shout'

(157) mtoto anampigisha mamake kelele 'The child is making its mother shout' (at it)

-fung-(D)/-fungish-(D_D) 'cause someone to close something'

(158) ametufungisha mlango bure 'He has made us shut the door to no purpose'

-fungish-$_2$(D) 'cause to be defeated, jailed'

(159) Juma aliifungisha timu yake 'Juma was instrumental in causing his team's defeat' (he simply played badly)

-fungish-$_3$(D) 'take an option on, reserve'

(160) amefungisha leso ile kwa Ibrahim 'She has reserved that kerchief with Ibrahim'

-fungiz-(D) 'confine'

(161) mvua imetufungiza leo 'The rain has kept us in today'

-shik-(D,C_e)/-shikish-(D_D) 'cause to take hold of'

(162) mshikishe mtoto kikabu 'Get the child to take hold of the book'

-shikiz-(D) 'stabilize'

(163) ishikize meza kwa kitu 'Stabilize the table with something'

-pik-(D,C_e,L)/-pikish-(D_D) 'make cook'

(164) mtoto amempikisha mama chakula 'The child has got his mother to cook food'

-naw-(D,L)/-nawish-(D_D) 'provide washing water'

(165) nimemnawisha mtoto (mikono) 'I have provided water for the child to wash his hands'

-navy-(D) or (D_D?) 'clean by washing'

(166) nimemnavya mtoto (choo) 'I have cleaned the child (after defecation)'

-som-(D,L)/-somesh-(D) 'provide education (for), teach'

(167) mimi nimemsomesha mtoto wangu 'I have seen to my child's education'

(168) mwalimu anawasomesha wanafunzi 'The teacher is teaching the pupils'

(169) skuli yawasomesha wanafunzi wengi 'The school produces/turns out many pupils'

-lim-(D,C_e,L)/-limish-(D) 'make cultivate'

(170) X alimisha shamba lake 'X. gets labour to cultivate his farm'

(171) shamba hili limenilimisha mwezi mzima 'This farm requires a whole month of hired labour'

-pit-(D,C,L)/-pitish-(D_D) 'cause to pass, enable to pass'

(172) mumewe alipitisha gunia chumbani 'Her husband got the sack into the room' (e.g. by pushing it)

(iii) <u>Verbs with L-complexes in their simple inventory</u>.

-ruk-(L,C,D)/-rush-(D_L) 'make fly'

(173) mtoto anarusha kishada chake kiwanj 'The child is flying his kite on the playing field'

-rukiz-(D_D,D) 'make fly over'

(174) alimrukiza mtoto sura mbili 'He got the child to skip two chapters'

(175) nimerukiza sura mbili 'I have skipped two chapters'

-kimbi-(L,D,C)/-kimbiz-(D_L) 'make run off'

(176) ukali wake ulimkimbiza sokoni 'His fierceness drove him from the market'

(177) mtu alimkimbiza mtoto shuleni 'Someone made the child run away from school'

-fik-(L,C,D_e)/-fikish-(D_L) 'cause to arrive'

(178) tulimfikisha mgeni mjini 'We saw the guest into town'

-tembe-(L,C,D_e)/-tembez-(D_L) 'take for a walk'

(179) alimtembeza mgeni mjini 'He took his guest for a walk in town'

-ka-(L,C,D_e)/-kalish-(D_L) 'keep seated, confine indoors'

(180) amenikalisha nyumbani kutwa 'He made me stay at home all day'

-shuk-(L,C,D_e)/-shush-(D_L) 'make descend, lower'

(181) mtu alishusha kikapu 'The man put down/lowered the basket' (i.e. by himself)

-shukish-(D) 'guide down, help lower'

(182) mtu alishukisha kikapu 'The man guided the basket down' (i.e. helped to bring it down)

-me-(L,C)/-mez-(D_L) 'plant'

(183) Ali ameimeza miti mingi sana (shambani) 'Ali has planted many trees (in the field)'

-rudi(L,C)/-rudish-(D_L) 'return something'

(184) mwanafunzi aliyarudisha mabuku yote 'The pupil returned all the books'

-tot-(L,C)/-tos-(D_L) 'Throw overboard, into the sea'

(185) mabaharia waliimtosa Ali baharini 'The sailors threw Ali into the sea'

-ja-(L,C,R)/-jaz-(D_R) 'fill'

(186) mama alijaza ndoo maji 'Mother filled the bucket (with) water'

-pa-(L,C,R)/-paz-(D_R) lit: 'cause to rise'

(187) habari iiimpaza mgeni roho 'The news gave the guest a turn' (lit: 'made his heart rise')

-wak-(L,C,R)/-wash-(D_R) 'set light to'

(188) mtu huyu aliwasha nyumba moto 'This man set fire to the house'

-wakish-(D)(NP_2 - anim) 'inflame' (fig.)

(189) tabia yake iiimwakisha mumewe 'Her behaviour infuriated her husband'

-ene-(L,C,R)/-enez-(D_R) 'cause to spread'

(190) mtu ameeneza habari mji mzima 'He spread the news round the whole town'

From a consideration of the above data it seems clear that a close syntactic relationship exists between the simple and the causative form. Provided the complex-inventory of the simple form is known, then the complex-pattern of the causative can be predicted with a high degree of probability. Thus, while a D-complex is a feature of all causatives, those verbs with S in the complex-inventory of their simple forms will accept D_D. Those with L and R will likewise accept D_L and D_R respectively.

4. Conclusions

In the foregoing pages an attempt has been made to reach a classification of Swahili verbs in terms of their capacity for participation in different kinds of complexes, this being an abstract device set up between the observable surface patterns and hypothesized deep structures. Basically the classification is trichotomous, yielding Stative, Directive and Locative case-complexes of verbs, but the boundaries between the classes are blurred because of what might be termed the multiplex character of verbal behaviour. The syntactic evidence for this is the participation by a given verb in different complexes, so that a number of verbs have to be labelled as e.g. Stative-Referential, Directive-Contrastive, Locative-Referential, Directive-Locative, etc. For example, an important group of Directive verbs may, equally, be Locative-oriented, while a substantial number of Locative verbs may be Directive-oriented, being associated, seemingly with progression through space (e.g. walk, run, etc.),

in contrast with non-Directive oriented locatives which to a significant extent are associated with dispersion over space (e.g. melt, float, etc.). While classification by surface behaviour is thus no simple trichotomy, some evidence has been presented to show that, given a complex-inventory for a simple verb, then that for the extended forms so far examined may be predicted with a high degree of probability.

The classification, however, reflects essentially a semantic ordering of reality, a given complex being a function of a particular component of meaning. At the same time, we have seen that a given verb may be associated with several meanings, some of which are linked to particular complexes and some of which are not. Are such verbs to be regarded as polysemous, or should one settle for a number of distinct but homonymous verbs? The difficulties of demarcating the boundaries between such homonymous verbs has been alluded to in Bolinger [1971], and will be apparent from the Swahili material presented here. Yet in the case of -tok-, such meanings as 'come from', 'leave', 'exude', 'protrude', 'belong to', etc. can plausibly be said to have some family resemblance, and it requires no great exercise of ingenuity to see a similar relationship between 'close', 'tie', 'jail', 'fasten', 'be constipated', etc. for -fung-. To argue for complete disparity here would be to lose sight of such affinities, which can more easily be kept in view if one suggests that they are all realizations of a hypothesized abstract meaning. Differences in meaning expressed as surface syntactic differences are then treated as functions of complex-membership on the one hand, and of the features and length of nominal series on the other. The limitations on nominal choice, for example, are commonly associated with specialization of meaning. Cases of surface ambiguity will undoubtedly occur,[16] but there are a number of ways to resolve them. A greatly simplified sketch for -fung- is given in Appendix 2, below.

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[16]As, for instance with the English verb 'remind'. Thus:

He reminded me of Tom (i.e. he looked like Tom)

He reminded me of Tom (i.e. he made me remember something to do with Tom)

A number of articles have recently appeared devoted to particular kinds of verbs, i.e. those of hitting, breaking, judging, 'performative' verbs, etc. For example, Halliday [1970] recognizes that, as far as the ideational component of the grammar is concerned, the English clause shows three principal types: action, mental process and relation, and he suggests that "possibly all languages distinguish three such categories" [Halliday 1970:153-156]. I have not been concerned here with relational clauses but it is worth pausing to consider whether his findings for the other two types are corroborated by the data for Swahili. Mental process clauses are listed as expressing perception, reaction, cognition and verbalization, all of which may be expressed in Swahili by Directive complexes. Evidence about the frequency of the Passive, suggested by Halliday, is difficult to adduce in any satisfactory way for Swahili, but his comment that what is perceived or felt or thought may also be a metaphenomenon is more interesting. Verbs of cognition in Swahili e.g. 'believe', 'realize', 'think', 'see' (figurative), 'worry', etc. may be followed not by NP_2 but by S, prefixed by some such item as kuwa, kwamba, etc. Thus:

(191) nafikiri kwamba amekosea 'I think he's made a mistake'

as contrasted with:

(192) nafikiri mambo mengi 'I think many things'

(193) niliona kuwa mengi yamebadilika 'I saw that much had changed'

Some verbs of verbalization are also characterized in this way, e.g. 'say', but others are not, e.g. -ping- 'contradict'. In a verb like -ambi- 'tell', which is typically characterized both by NP_2 and NP_3, only the latter can be replaced by S. Thus:

(194) nilimwambia Ali kwamba mgeni atafika leo 'I told Ali that the guest would come today'

By contrast, with verbs of perception and reaction, e.g. 'look at', 'stare at', 'see' (literally), 'like', 'dislike', etc., such substitutions of NP_2 do not normally occur. A sentence such as:

(195) napenda kuwa afike 'I want him to come'

is definitely rather strained. I recognize the unsatisfactoriness of such frequency statements but, as so often, one is not faced with a clear contrast between occurrence and non-occurrence, but between more or less probable, more or less acceptable, which seems to demand some kind of probabilistic statement based on quantitative evidence.

Thus it cannot be said, within my framework, that mental process clauses contrast generally with action clauses in Swahili: rather it is the case that some verbs which connote mental processes and accept Directive-complexes, also display features which would justify the setting up of some sub-group. It is likely that other sub-groups could be established by invoking additional criteria. Thus, verbs with S or $L(L_R)$ in their complex-inventory will typically not accept imperativization, in contrast to those with D(including L_D) in their inventories which will. Yet an L-verb like -j- 'come' is anomalous in this respect, and for certain D-verbs of <u>reaction</u> e.g. 'like', 'want', 'dislike', 'feel', 'know', etc., a simple imperative is probably unacceptable in most varieties, though an imperative with object is perhaps marginally more acceptable. For some verbs, too, one would need to recognize homonymous forms to be marked plus or minus imperative.

Several points need to be made here. Firstly, the selection of test frames for syntactic environments e.g. what X did to Y as to ... is difficult to operate outside certain central cases and leads quickly towards a large area of indeterminancy. Secondly, the boundaries of sub-groups thus established tend to overlap and to complicate the overall picture considerably. Finally, it is not clear by what criteria different frames are to be selected (e.g. is imperativization a more significant phenomenon than passivization?).

As stated at the outset, the aim of this paper is essentially exploratory, seeking to expose the diversity of surface patterns which must be explicitly accounted for in any theoretical treatment of sentences of this type if simplistic theoretical formulations are to be avoided.

REFERENCES

Abdalla, M. S. 1968. Kisima cha Giningi. London: Evans.

Ashton, E. O. 1944. Swahili Grammar. London: Longmans.

Bolinger, D. 1971. "Semantic overloading: a restudy of the verb remind." Language 47.3:522-547.

Chafe, W. 1971. "Directionality and paraphrase." Language 47.1:1-26.

Christie, J. J. 1971. "A note on causatives in Swahili." (Unpublished)

Dougherty, R. C. 1970. "Recent studies on language universals." Foundations of Language 6.4:506-531.

Fillmore, C. 1968. "The case for Case," in Universals in Linguistic Theory. Edited by Emmon Bach and Robert T. Harms. New York: Holt, Rinehart and Winston.

Fillmore, C. 1970. "The grammar of hitting and breaking," in Readings in English Transformational Grammar. Edited by R. A. Jacobs and P. S. Rosenbaum. Waltham, Mass.: Ginn.

Halliday, M. A. K. 1968. "Notes on transitivity and theme in English" (III). Journal of Linguistics 4.2:179-215.

Halliday, M. A. K. 1970. "Language structure and language function," in New Horizons in Linguistics, pp. 140-165. Edited by John Lyons. Harmondsworth: Penguin.

Harries, L. P. 1970. "Obligatory relationships in Bantu grammar." Journal of the Language Association of Eastern Africa 1.2:15-18.

Huddleston, R. 1970. "Some remarks on Case-grammar." Linguistic Inquiry 1.4:501-511.

Loogman, A. 1965. Swahili Grammar and Syntax. Pittsburgh: Duquesne University Press.

Polomé, E. C. 1967. Swahili Language Handbook. Washington, D. C.: Center for Applied Linguistics.

Sacleux, C. 1909. Grammaire des Dialectes Swahilis. Paris: Procure des Pp. du Saint-Esprit.

Scotton, C. M. M. 1967. "Semantic and syntactic subcategorization in Swahili causative verb shapes." Journal of African Languages 6.3:249-267.

Weinreich, U. 1969. "Problems in the analysis of idioms," in Substance and Structure of Language. Edited by J. Puhvel. Berkeley: University of California Press.

Whiteley, W. H. 1968. Some Problems of Transitivity in Swahili. London: School of Oriental and African Studies.

Whiteley, W. H. and J. Mganga. 1970. "Focus and Entailment: further problems of transitivity in Swahili." African Language Review 8:109-125.

APPENDIX 1

Summary of major complexes and combinations accepted by simple verbs.

A. S-complexes [V(-op), -NP_2]

(S_R) e.g. -chaka- 'be worn out', -chok- 'become tired'

(S,L) e.g. -f- 'die'

(S_P) e.g. -fuk- 'emit'

B. D-complexes [V(±op)]

(D) [NP_1(+anim)]
e.g. -log- 'bewitch', -pos- 'ask in marriage', -kumbuk- 'remember', -tand- 'catch fish' (dagaa)

(D,D_P) e.g. -on- 'see', -fich- 'hide', -safish- 'clean'

(D_B) [V(+op, +anim)]
e.g. -p- 'give', -lip- 'pay', -fany- 'do', -pak- 'smear, daub', -paki- 'load'

(D,C_e) e.g. -l- 'eat', -nyw- 'drink', -va- 'put on clothes', -pig- 'hit', -shik- 'grasp'

(D,D_R) e.g. -jeng- 'build', -tazam- 'look at', -shik- 'catch hold of', -pend- 'like', -chuki- 'dislike'

(D,D_B,D_R) e.g. -fung- 'fasten'

(D_L)
- (D,L) [NP_1(+anim)] e.g. -vun- 'harvest', -chung- 'herd', -naw- 'wash (esp. hands and face)', -som- 'read', -fyek- 'clear land'
- (D,C_e,L) e.g. -lim- 'cultivate', -pit- 'pass', -pand- 'climb', -pand- 'plant', -pik- 'cook'
- (D,L,D_B) e.g. -ti- 'put, place'
- (D,L,D_P) e.g. -vunj- 'break'

The important division here is between those D-verbs which will accept an L-complex and those which will not. Acceptance of C_e patterns is subject to a much higher degree of variability among informants.

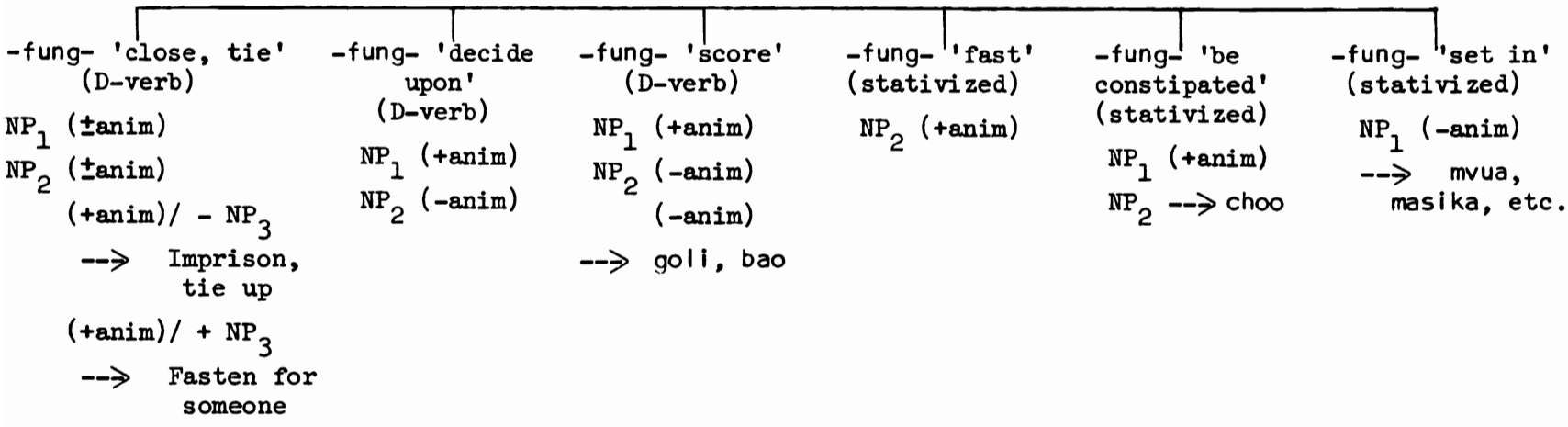
C. L-complexes [V(-op)] Including C-complexes in all cases.

(L)	e.g.	-pepe- 'wave', -vuj- 'leak', -pa- 'rise', -ning'ini- 'sway', -yeyuk- 'melt' -zam- 'sink', -me- 'sprout', -ele- 'float', -j- 'come', -tot- 'sink down, drown'
(L_R)	e.g.	-tand- 'spread over', -ja- 'become full', -wak- 'burn, be burning'
(L_R,L_P)	e.g.	-ene- 'extend over', -kauk- 'become dry'
(D_L) (L,D)	e.g.	-ruk- 'jump on, over', -end- 'go', -kimbi- 'run from, avoid'
(D_L) (L,D_e)	e.g.	-simam- 'stand up', -fik- 'arrive', -tembe- 'walk, stroll', -telemk- 'descend', -tamba- 'crawl'

The important division here is between those L-verbs which will accept a D-complex and those that will not.

APPENDIX 2

-FUNG- 'ENCLOSE



NOTE: The slash '/' denotes 'in the environment of'.

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TONE FEATURES AND TONE RULES

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1. Introduction

Linguists, working within the Generative Phonology paradigm, are attempting to establish a theory which defines formally and substantively the phonological components of grammars which will specify all and only the set of possible sound systems of human languages. Such a theory must provide a set of features for characterizing tone and other prosodic phenomena of language. It must also include constraints on tonal representation, the formal properties of tonal rules, and conventions which govern the interactions of tone rules with other rules of the grammar. This paper attempts to deal with some of these important questions. In particular it will discuss the distinctive features of tones (level and contour tones), tonal representation, and rules in a generative grammar.

2. The Distinctive Features of Level Tones

In one of the earliest proposals concerning "The distinctive features of tone" [Gruber, 1964] two tonal features, High and High 2 were proposed, which features provided the means for distinguishing between two, three, or four level tones. Implicit in this proposal is the claim that the basic distinction in any tone language is between high tones and non-high tones, with all other tonal contrasts being made within these two disjunctive sets. Thus, a language with two contrastive tones, would utilize only the feature High, a language with three or four contrastive tones would, in addition, specify tones using the feature High 2 as shown under (1).

(1) a. Two tone contrast: [+high] and [-high]

b. Three tone contrast: $\begin{bmatrix}+\text{high}\\+\text{high 2}\end{bmatrix}\ \begin{bmatrix}+\text{high}\\-\text{high 2}\end{bmatrix}\ [-\text{high}]$

or $[+\text{high}]\ \begin{bmatrix}-\text{high}\\+\text{high 2}\end{bmatrix}\ \begin{bmatrix}-\text{high}\\-\text{high 2}\end{bmatrix}$

c. Four tone contrast: $\begin{bmatrix}+\text{high}\\+\text{high 2}\end{bmatrix}\ \begin{bmatrix}+\text{high}\\-\text{high 2}\end{bmatrix}\ \begin{bmatrix}-\text{high}\\+\text{high 2}\end{bmatrix}\ \begin{bmatrix}-\text{high}\\-\text{high 2}\end{bmatrix}$

Wang [1967] accepts Gruber's primary division between + and - High, but proposes two additional tonal features to replace High 2: Central and Mid. (In addition, he adds four 'contour' tone features, which will be discussed below.) Assuming a number of universal redundancies which he proposes, by this system, five level tones can be distinguished, as shown in (2).

(2)

	High	+	-	+	-	-
	Central	-	-	+	+	+
	Mid	-	-	-	-	+

Wang's features seem immediately superior to Gruber's in that the ad hoc feature High 2 is replaced by features with greater phonetic plausibility, and, in addition, five rather than four tones may be contrasted.

Sampson [1969] finds certain difficulties with Wang's system, particularly in relation to the feature Mid, which according to Wang would be needed only for those languages with five level tones. He proposes, therefore that the three tone features be High, Central, and Low providing the contrasts as shown in (3).

(3)

	High	+	+	-	-	-
	Central	-	+	+	+	-
	Low	-	-	-	+	+

Although in this proposal, both the features Central and Low are used only when there are more than three contrastive tones, it is of course possible that the particular tone system of a language could (unless constrained by the theory) utilize the features High and Central or High and Low. This position is argued for below.

The features suggested by Sampson are essentially those adopted by Woo [1967, 1969].

At a conference on 'Tone in Generative Phonology', held in Ibadan in 1970, following a suggestion by Maddieson [1971], the participants concluded that the features Raised and Lowered should be substituted for High and Low respectively "to avoid possible confusion with 'High' and 'Low' as features of tongue height." [p. 76] They further concluded that

for a four or five level system a feature Extreme be utilized. Two, three, four, or five tone systems would thus be represented as given in (4).

(4) a. two tone system

i.

	High	Mid
Raised	+	-

or ii.

	Low	Mid
Lowered	+	-

b. three tone system

	High	Mid	Low
Raised	+	-	-
Lowered	-	-	+

c. four tone system or five tone system
(in a four tone system, the fourth tone is either 'extra high' or 'extra low')

	Mid	High	Low	Extra high	Extra low
Raised	-	+	-	+	-
Lowered	-	-	+	-	+
Extreme	-	-	-	+	+

[Cf. Maddieson, 1971]

Maddieson attempts to present both phonetic and phonological reasons for the four level tone features exemplified in (4). The discussion does not seem to be over as yet. In a paper presented to the Seventh International Congress of Phonetics, Halle [1971] continues the debate. He agrees that "it is clearly necessary that the universal phonetic framework provide for a distinction of at least three pitch levels: high, mid, and low." Relating these pitch distinctions to vocal cord stiffness, he proposes two binary features which can distinguish these three tones: [stiff vocal cords] and [slack vocal cords]. (This proposal is earlier made in Halle and Stevens [1971]. The earliest proposal concerning these features was put forth by Maran [1968] and adopted by Bird [1971].)

The earlier discussions on tonal features do not attempt to provide physiological correlates for them but relate them more specifically to auditory correlates. Thus Maddieson notes that "the phonetic correlate of [+Raised] is 'higher than a notional median pitch' and of [-Raised] 'not higher than a notional median pitch'." [p. 8] The phonetic correlates of Lowered are described similarly. Halle's proposal on the other hand ties the pitch levels directly to glottal states as is shown in (5).

(5)

	Mid - V	Low - V̀	High - V́
Stiff	-	-	+
Slack	-	+	-

(The following symbols will be used throughout:
V = Mid Tone; V̄ = Lower Mid Tone; V́ = High Tone;
V̀ = Low Tone; V̌ = Rising Tone; V̂ = Falling Tone;
V̗ = Down Step)

In a language with three contrastive tones, such as Yoruba or Nupe, these two features are needed to specify the phonological vowels as to tone. For languages in which there are only contrasts between two tones, such as Akan, Igbo or Hausa, it would seem, then, that either the feature Slack or the feature Stiff would be redundant. In languages such as English with no lexical tonal contrast, vowels would all be [-stiff, -slack], neither feature being distinctive. This follows the suggestion that the vowel specified as [-stiff, -slack] is the 'neutral' vowel [Halle, 1971; Halle and Stevens, 1971]. Marking conventions can then specify a 'mid tone' vowel as the unmarked vowel as shown in (6).

(6)

a. u Stiff vocal cords $\rightarrow$ - / $\left[\begin{array}{l}\text{\_\_\_\_\_}\\ \text{+syllabic}\\ \text{-consonantal}\end{array}\right]$

b. u Slack vocal cords $\rightarrow$ - / $\left[\begin{array}{l}\text{\_\_\_\_\_}\\ \text{+syllabic}\\ \text{-consonantal}\end{array}\right]$

(But see below for marking conventions concerning these features when specified for consonants.)

For languages with two contrasting tones only one vowel would be marked. For Akan or Igbo (following the suggestion of Maddieson [1971]) the high tone vowel would be marked in contrast with the neutral vowel, while in Hausa, the low tone would be marked. A non-tone language such as English would then have all unmarked vowels for these features.

One problem is immediately apparent using the Halle/Stevens tonal features. Halle states that the theory must distinguish "at least three pitch levels." 'At least' is not 'only'. There is no way given the features Slack and Stiff to distinguish more than three level tones, since, as they themselves point out, [+stiff, +slack] is physiologically impossible and must therefore be disallowed by marking conventions. Yet, "systems with four contrasting levels...are clearly established for several languages" as shown by Welmers [forthcoming] in the following examples:

(7)

			Tones	
Tigong:	a.	efíkpí	mid-high-high	'axes'
	b.	esya	mid-mid	'holes'
	c.	enwā	mid-lowered mid	'men'
	d.	ekì	mid-low	'canoes'
Ndoro:	e.	símí	high-high	'adze'
	f.	čarɪ	mid-mid	'axe'
	g.	čēlā	low mid-low mid	'stone'
	h.	šòrà	low-low	'chicken'

Longacre [1952] has presented evidence for five distinctive pitch levels in the Mixtecan language Trique, and Fang Kusi Li reported that Black Miao has five level tones and two rising and falling tones (as reported by Voegelin [1965]).

It is of course true that phonetically many more levels of pitch must be distinguished. There are a number of ways to specify these, the easiest probably being to rewrite tonal features into relative pitch levels using integers. But the question as to whether we need more than three phonological tone contrasts is, to quote a linguistic cliche,

'an empirical one'. If Welmers and Longacre and Fang Kusi Li are correct, the Halle tonal features would be descriptively inadequate.

There are additional problems which arise even if it is shown that all the four and five level systems are lexically or basically three tone systems.

One of the main motivations for using Stiff and Slack as features for tonal specification was because "the same set of features governs both pitch levels in vowels and voicing in obstruents" [Halle, 1971]. This proposal then is based on the claim that one finds "three types of obstruents: voiceless, voiced, and intermediate: the first corresponding to the high pitch vowels, the second to the low pitch vowels, and the third to vowels with mid pitch." It is further argued that "the appearance of high pitch in a vowel adjacent to a voiceless consonant, and of low pitch in a vowel adjacent to a voiced consonant is not fortuitous but rather a case of assimilation (supporting)...the claim...that the same set of features governs both pitch levels in vowels and voicing in obstruents." Halle therefore proposes to substitute the two features discussed above for the feature Voiced. (Two additional features, Spread Glottis and Constricted Glottis are also substituted for the earlier features Tensity, Glottal Constriction, and Heightened Subglottal Pressure [Halle and Stevens, 1971]. A criticism of the phonetic adequacy of these features for consonants is beyond the scope of this paper but cf. Lisker and Abramson [1971], Ladefoged [1971a].)

Given these two features, the contrast between voiced and voiceless stops in languages with a two-way distinction would then be represented as:

(8)

	Voiceless	Voiced
Stiff	+	-
Slack	-	+

Since the unmarked obstruent is presumably voiceless, we can reveal this by changing the Marking conventions given under (6) above to:

(9)

a. u Stiff --> α Stiff / $\begin{bmatrix} \_\_\_\_ \\ -\ \alpha syl \\ \alpha cons \end{bmatrix}$

b. u Slack --> - Slack / $[\_\_\_\_]$

In other words, the unmarked value for Stiff for vowels is minus, but plus for consonants; and the unmarked value for Slack is minus for true vowels and true consonants, and glides. (Glides are also specified as [-stiff, -slack].) No mention is made of liquids [Halle and Stevens, 1971].

The highly marked nature of 'slackness' and the asymmetry of these two features is not the basic difficulty. Using the former feature Voiced, a phonological rule which voices obstruents intervocalically reveals this assimilation as a change from an unmarked feature value to a marked [Schachter, 1969]. Using the new features the same process occurs.

(10) [+stiff] --> [-stiff] / [-stiff] ___ [-stiff]

But this assimilatory rule also occurs in tone languages. For the assimilatory nature of the process to be revealed, the intervocalic voicing would have to be restricted to occurring between non-high vowels, since high tone vowels, like voiceless obstruents are [+stiff, -slack]. Where intervocalic voicing occurs before <u>all</u> vowels, regardless of the tones, the rule will have to be written as in (11).

(11) [+stiff] --> [-stiff] / [+syl] ___ [+syl].

But (11) makes it appear that this 'unstiffening' process is non-assimilatory, or ad hoc. Furthermore, in languages where vowels are devoiced after certain voiceless obstruents (such as in Japanese) the rule must be stated as in (12).

(12) [+syl] --> [+spread glottis] / $\begin{bmatrix} -syl \\ +stiff \end{bmatrix}$ ___

(12) must be stated in this ad hoc fashion because according to Halle and Stevens [1971] the feature specification of the relevant segments is as shown in (13).

(13)

	VOWELS				OBSTRUENTS	
	V	V̀	V́	Voiceless V	Voiced	Voiceless
spread glottis	-	-	-	+	-	-
constricted gl.	-	-	-	-	-	-
stiff v. cords	-	-	+	-	-	+
slack v. cords	-	+	-	-	+	-

Using these features we are forced to abandon our traditional collective linguistic intuition that the voicing and devoicing of consonants and vowels is a natural process, i.e. that the voicing of intervocalic consonants occurs because vowels are voiced, irrespective of the pitch of the vowels. This is not to say that there is no relationship between tension of the vocal cords and pitch. But a rise in pitch may result from either an increase in the tension of the vocal cords or an increase in the air pressure below them [Ladefoged, 1963, 1964, 1967, 1971a; Ohala, 1970]. In fact, in tone languages, "there is often an increase in subglottal pressure during high tones" [Ladefoged, 1971b]. The attempt, then, on the part of Halle to explain the relationship between voicing and tones, obscures the relationship between identical glottal strictures for consonants and vowels. Ladefoged suggests instead that a feature glottal stricture be posited to account for just such phenomena, and for other phonological oppositions Halle and Stevens specify by their features. This feature would have a number of possible values (although, according to Ladefoged, any one language will not utilize more than three contrasting values.) He states that the feature defines a continuum and that it is impossible (even meaningless) to state how many possible values there are. He further suggests that on the classificatory level we might specify this feature by binary values for languages using only two states of the glottis, and by the integers /0 1 2/ in the classificatory matrices for languages contrasting three states of the glottis. Then, by either universal 'interpretive rules' or by context-restricted phonological rules, these items would be given appropriate values.

While I am in basic agreement with this proposal, the need for language specific mapping rules would create an unnecessary problem. If, however, the continuum is divided into a given set of discrete values and if, for example, [5 glottal stricture] means voiced for all languages, one can easily write a natural rule of voicing assimilation as in (14).

(14) [+segment] --> [5 GS] / [5 GS] ___ [5 GS]

One may recall that Chomsky and Halle [1968] argued for the substitution of the features High, Back and Low for the earlier features Diffuse, Compact and Grave because "the former framework...did not bring out the fact that palatalization and velarization characteristically occur before front and back vowels, respectively; the connection between palatalization and front vowels and between velarization and back vowels was no more motivated than a connection between glottalization or voicing and front vowels." [p. 308] If we accept this reasoning, and I think we should, one cannot at the same time accept the new features proposed, since the intervocalic voicing of obstruents between high tone vowels or the unvoicing of vowels after voiceless consonants would then be "no more motivated than a connection between...voicing and front vowels."

The desire to select features in the universal set which will explain diachronic changes as well as synchronic phonology is admirable. Until we can find a more 'explanatory' set of features, it would be better to include in the universal theory a set of statements relating glottal strictures and vowel tones than to substitute, for features such as Voiced, features which obscure natural processes in synchronic grammars.

One more question must be considered prior to deciding on the most adequate set of tonal features. In both Halle's system and Maddieson's, the 'neutral' or 'unmarked' tone is the mid tone -- [-stiff, -slack] and [-raised, -lowered], respectively. This presents certain difficulties for 'terraced level' [Welmers, 1959] tone languages. In these languages, one finds three 'phonetic' tones -- high, lowered high ('downstep' or 'drop' represented as $\overset{!}{V}$), and low, in which the 'downstep' tone occurs only after a high tone. This 'downstep' is illustrated in the examples from Akan, shown in (15):

(15) a. mɛ́hɔ́[1] [¯ ¯] 'I will strike'
b. mé bɔ̀ [¯ -] 'my stone'
c. mé bɔ̀ [¯] 'my chest'
-

Following a proposal by Stewart [1964], Schachter and Fromkin [1968] derive all 'downstep' tones by a pitch assignment downdrift rule and vowel deletion rules. In such a case, one need not be concerned about the feature specification for the 'downstep' tone, since it would be specified as a high tone (i.e. [+stiff] or [+raised]) and its differentiation from other high tones would be solely based on a pitch value assigned to it. In (15b) and (15c) the underlying forms for 'stone' and 'chest' are ɔ̀bɔ́ and ɔ̀bɔ̀ respectively. The ɔ̀ represents a nominal prefix which is deleted in certain contexts. The following rules will take care of the 'drop' tone which appears on the surface.

(16) Pitch assignment (PA): a. [+ high] --> p 1
b. [- high] --> p 3
(p = relative pitch value. [± high] is used here arbitrarily, i.e. for these rules one could also use [± stiff] or [± raised]. I am following the suggestion of Johnson [1970] and Williamson [1971] in their comments on Schachter and Fromkin [1968] to designate the highest relative pitch by '1' and all lower pitches by larger integer values.)

(17) Downdrift (DD)
RL: [αH] --> [αH p <+ 1>] / [αH p]< [-αH]$_1$ > ___
(where H = high tone)

The 'RL' at the beginning of the rule specifies it is a Right Linear Rule [Johnson, 1970] which applies to the left most segment which meets the rule specification first, then moves to the next segment from left to right, applying in each case when the structural description is met. The formulation with slight changes was provided by Grover Hudson. It abbreviates the following four rules:

---

[1]In (15) and in subsequent examples the Akan utterances are given in orthographic representation except for the tones.

(17) a. [+H] --> [+H p+1] / [+H p] $[-H]_1$ ___

b. [+H] --> [+H p] / [+H p] ___

c. [-H] --> [-H p+1] / [-H p] $[+H]_1$ ___

d. [-H] --> [-H p] / [-H p] ___

(18) Vowel Deletion (VD) V --> Ø in certain contexts.

The following derivations illustrate how these rules apply.

(19)

	/ me ɔbó / 'my stone'	/ me ɔbò / 'my chest'
PA	1 3 1	1 3 3
DD	2	———
VD	Ø	Ø
	[mé bó]	[mé bò]
	1 2	1 3

While the above may solve the problem for terraced level languages in which all downstep tones are derived from underlying high tones, it seems that this is not true in all synchronic grammars. One finds that at a certain stage in the history of such languages, the derived 'downstep' may become 'phonemic'. That is, even in Akan, where most 'downstep' tones are still derived from high tones, as in the examples above, there are formatives which now have 'downstep' tones which cannot be derived from high tones after the deletion of low tones without a great deal of ad-hoc-ery, as shown in (20).

(20)

a.	àbèrántɛ́ɛ́	[- - -]	'young man'
b.	àkúá	[- -]	'Akua' (name of a girl born on Wednesday)
c.	ɑ́ɑ́né	[- -]	'yes'

One can, of course, set up an underlying low tone which never appears on the surface and which is later deleted. The 'absolute neutralization' [Kiparsky, 1968] solution only obscures what has really occurred historically in the language, i.e. the derived mid or downstep tone has become phonemic. As Vennemann [personal communication] points out, a solution

which does not posit an underlying 'downstep' tone fails to reveal a complexity in the language which has arisen by historical processes, and such a solution should therefore be considered unacceptable, even if by such a method we appear to arrive at a 'simpler' two-tone language solution.

Assuming the correctness of this position, how would one use either the Halle or Maddieson features to specify the three way underlying tonal contrast? If the 'downstep' tone is considered a 'mid' tone (and in their systems it would have to be), then it is just this mid, neutral, unmarked tone which is highly restricted and very infrequent. This is certainly a counter-intuitive specification. In addition, using their features, the 'downstep' tone would be equally distant from the high and low tones. This of course is not the case, since all derived 'downsteps' emerge from underlying high tones. Neither Halle's nor Maddieson's tone features capture the relationship between High and Downstep. Wang's and Sampson's features do. Thus, given a 'terraced level' language with both underlying 'downstep' tones and derived ones, we can rewrite the tone rules given above. One must also include the Morpheme Structure Condition (21) which constrains the 'Downstep' to positions after high tones.

(21) MSC: If: [ ] [+ Mid]

Then: [+ High]

The features specifications of the three tones would be:

(22)

	High	Downstep	Low
High	+	+	-
Mid	-	+	-

To derive the correct relative pitches in a language with three underlying tones, high, downstep, and low, the pitch assignment rule (16) need not be changed, but the Downdrift Rules must be changed as given in (23):

(23) $[\alpha\ H] \text{ --- } [\alpha\ H\ p\ <+1>_{1,2}] / \begin{bmatrix} \alpha\ H\ p \\ <-\ M>_1 \end{bmatrix} < [-\alpha H]_1 >_2 \begin{bmatrix} \overline{\quad} \\ <+\ M>_1 \end{bmatrix}$

which expands to:

a. $[+\ H] \text{ --- } [+\ H\ p\ +1] / \begin{bmatrix} +\ H\ p \\ -\ M \end{bmatrix} \begin{bmatrix} \overline{\quad} \\ +\ M \end{bmatrix}$

b. $[+\ H] \text{ --- } [+\ H\ p\ +1] / [+\ H\ p]\ [-\ H]_1 \_\_\_$

c. $[+\ H] \text{ --- } [+\ H\ p] / [+\ H\ p] \_\_\_$

d. $[-\ H] \text{ --- } [-\ H\ p\ +1] / \begin{bmatrix} -\ H\ p \\ -\ M \end{bmatrix} \begin{bmatrix} \overline{\quad} \\ +\ M \end{bmatrix}$

e. $[-\ H] \text{ --- } [-\ H\ p\ +1] / [-\ H\ p]\ [+\ H]_1 \_\_\_$

f. $[-\ H] \text{ --- } [-\ H\ p] / [-\ H\ p] \_\_\_$

(24) provides a derivation which illustrates how the rules work:

(24) / àbèrántɛ́ɛ́ bɛ́kɔ́ ɛ̀hɔ́ / [àbèrántɛ́ɛ́ bɛ́kɔ́ hɔ́]

'The young man will go there'

PA	3	3	1	11		1	1	3	1	
DD				22		2	2	4	3	
VD					Ø					$\begin{bmatrix} - & - & - & - & - \\ - & - & & & - \end{bmatrix}$
	3	3	1	22		2	2	3		

By the Pitch Assignment rule all tones designated as [+H] (including the Downstep Tones which are also [+M]) are assigned a pitch value of '1', and all [-H] tones are assigned a pitch, of '3'.

We start applying the Downdrift Rule to the left most tone. None of the rules collapsed by the schema (23) applies since it is the initial tone. Moving to the next tone, a, b, and c are inapplicable since the tone is [-H]; d does not apply since the tone is not [-H, +M] (in fact, it can never apply since no tone will be so specified); e cannot apply since the tone is not preceded by a [+H]; f applies vacuously since the assigned p = 3 already matches the assigned value to the preceding Low tone. None of the rules apply to the first high tone so the pitch value is left at '1'. a applies to the next tone, since it is specified as [+H, +M] and is preceded by a [+H, -M] tone. We therefore add '1' to the value assigned to the previous High Tone pitch value, deriving a pitch

value of '2'. Only c applies to the next three [+H, -M] tones, assigning the same pitch value, '2', as has been specified for the previous [+High, +Mid] tone. Note that the value for the feature Mid does not influence this pitch assignment. The ɛ̀ in ɛ̀hɔ́ is assigned a pitch value of '4' by e, and the final tone is assigned a value of '3' by b. After the Vowel Deletion Rule has applied, the final output has two downstep tones, one underlying and the other derived.

By specifying the 'downstep' tone as [+high] we are able to show the relationship between the High tone pitch values and the 'downstep' tone, and use the same rules to assign pitch values for underlying 'drop' tones as well as derived 'drop' tones. This, I believe, argues strongly against either the Halle features or the Maddieson features. One can of course write a complicated set of rules deriving the correct pitch values using features which specify the 'downstep' as 'equally related' to both the high and the low tones. The effort does not seem warranted however, since the Halle features have been shown to be deficient on other accounts, and the Maddieson features do not seem to add anything or explain any more than do Sampson's or Wang's features. Rather, less is explained, since using a mid feature the historical development of three-tone languages from two-tone languages is more easily revealed.

For the reasons given above, I propose that the Universal Set of Distinctive Features include three tone features: High, Mid, Low. In addition, I suggest that it is impossible to specify which tone is the 'unmarked' tone for all languages, since each particular tone system evolves historically in different ways. While the mid tone may be the least marked tone in a language such as Yoruba, in Twi where we find a three tone system developing from a two tone system, it is the low tone which is 'unmarked'. One may, however, suggest that the historical changes which occur will move toward a more stable three tone system in which the 'downstep' will become the 'neutral' tone, or it may become a contour tone as in Gwari [Larry Hyman, personal communication]. More research is needed on the historical developments of tone languages before we can reach this conclusion. Finally, I suggest that there is a hierarchy for tonal features, i.e. that in tone languages the basic

division, following Gruber and Wang, is between high and non-high tones, but that the features Low and Mid are equally placed in this hierarchy. That is, for a three tone language, either Low or Mid will be the second tone utilized, depending upon the particular phonological system of rules in the synchronic grammar. Similarly, for a four or five tone system, the feature specifications for the mid tones should depend on the particular tonal rules present, i.e. a four tone system may include High, High-Mid, Mid, and Low tones, or, High, Mid, Low-Mid, Low, etc.

We may, of course, find, upon further investigation, that there are universal constraints governing the interaction of tones in a multi-tone system. Before such empirical evidence is presented, however, our theory must at the minimum be descriptively adequate. Placing constraints at this time may force us into Procrustean solutions which will obscure the intricacies of tonal phenomena.

3. The Need for 'Contour' Features

In Section 2, the features for the specification of level or 'register' tones were discussed. Phonetically, all linguists have observed the occurrence of 'contour' or 'non-stationary' tones. To provide for such occurrences, Wang [1967] proposed that a feature Contour be used to distinguish stationary from non-stationary tones. He further suggests that for tones specified as [+ contour], three additional features be available: Rising, Falling, and Convex. All [+ contour] tones would be redundantly [- central, - mid]. Using this set of features, one could then distinguish eight contour tones as shown in (25).

(25)

Contour	+	+	+	+	+	+	+	+
High	+	-	+	-	+	-	+	-
Rising	+	+	-	-	+	+	+	+
Falling	-	-	+	+	+	+	+	+
Convex					-	-	+	+

(Note that Convex is redundantly - for contour tones which have opposite values for Rising and Falling.)

There are two main questions which concern contour tones: (1) whether Contour tonal features are needed at all, and (2) if they are needed are Wang's features the set which should be included in the theory.

As to the first question, a suggestion by Woo [1967, 1968, 1969, 1970] that contour tones should be represented in the lexicon in all cases as sequences of level tones was adopted by the Ibadan Conference [1971], by Leben [1971] and by Halle [1971]. Halle extends the proposal to the phonetic level as well as the classificatory level. "...on the systematic level all tones are stationary. Non-stationary tones, such as 'rising', 'falling', or 'convex' are more or less surface phenomena; they have much the same status as the different formant transitions that are found in a given vowel when it is adjacent to different stop consonants." In other words, according to Halle, the universal set of features will not include contour features for tone.

The evidence for restricting underlying, phonological tones to stationary tones is based to a great extent on the existence of 'tone copy' rules. It is shown, for example, that there are no cases reported where a contour tone is copied; in the case of rising tones, a high tone is copied, and in the case of a falling tone, a low tone is copied, when it is the following tone which is changed [Leben, 1971]. Leben provides numerous examples from Hausa, Yala, and Mende in support of this position; Woo [1970] shows this to be the case in North Tepehuan; Halle [1971] presents further evidence from Serbo-Croatian and Slovenian.

In Nupe, George [1970] has shown that all rising and falling phonetic tones can be derived from underlying level tones. Rising tones are the result of a 'tone copy' rule which George writes as in (26)

(26) [+H] --> [+G] / [+L] [+Cons, +Vcd] ___

([+H] = High Tone; [+L] = Low Tone; [+G] = Gliding Tone)

This rule can also be written as (27) if it is stated that a sequence of two immediately following tones are realized phonetically as a glide.

(27) [+H] --> [+L] [+H] / [+L] [+Vcd] ___

In fact, unless one posits the rising tone (i.e. Low to High Tone Glide) as a sequence of two tones, the first being a copy of the tone which immediately preceded it, the rule seems very ad hoc.

Since no evidence has been put forth showing the need to consider underlying contour tones as intrinsic, can we then dispense with any contour tone features? Do contour tones indeed "have the same status as the different formant transitions"?

To exclude from the universal set of features any contour tonal feature would violate the very goals Halle accepts: "all grammatically determined facts about the production and perception...are embodied in the 'phonetic transcription'" [Chomsky and Halle, 1968]. Furthermore, as Chomsky [1967] points out: "it is important to note that the distinctive features postulated in universal phonetic theory are absolute in several senses but relative in others. They are absolute in the sense that they are fixed for all languages. If phonetic representation is to provide sufficient information for identification of a physical signal, the specification of feature values must also be absolute." [p. 404]

If we find that in every language, a succession of two tones is always realized as a contour or gliding tone, the absolute nature of the phonetic signal is fixed and one can, as Halle suggests, dispense with any contour tonal feature.

Unfortunately, the facts seem to contradict this assumption. In Nupe, as rule (27) shows, the sequence of a low tone followed by a high tone is realized as a low tone followed by a rising tone only if the two syllabic segments are separated by a voiced consonant. Thus one finds the following phonetic contrasts: (all examples from George [1970]).

(28) a. ètú [ètú] [_ ¯] 'parasite'

b. èdú [èdǔ] [_ ◡] 'taxes'

(29) a. èkpá [èkpá] [_ ¯] 'length'

b. ègbá [ègbǎ] [_ ◡] 'a garment border'

Leben [1971] provides other examples from Yala where phonetically one must differentiate between a high tone followed by a low tone, and a high tone followed by a falling tone:

(30) a. ó kà [˥ ˥˩] 'he said'

b. kó kà [˥ ˧] 'let him speak'

According to Leben, (30b) does not have the glide because of the deletion of an intervening low tone, which rule follows the glide formation rule. If the phonetic representation is to represent the grammatically determined facts of Yala, and "sufficient information for the identification of a physical signal", then the difference between a contour tone and a sequence of level tones must somehow be represented in the systematic phonetic output of the grammar.

Another example of the need for a contour/non-contour contrast is given by Stewart [1962]. He points out that in some dialects of Fante, depending on the syntactic and lexical features of a string, a pre-pause high tone may be realized as a high-rising gliding tone rather than a high level pitch, as illustrated in (31).

(31) a. ɔbɛ́ká [˧ ˥˩] 'he will remain'

b. ɔbɛ́ká [˧ ˥] 'he will bite it'

Furthermore, in Nupe, there is a phonetic falling tone which derives from a sequence of either high-low or mid-low in rapid speech, which is realized as step tones in slow deliberate speech as shown in (32) [George, 1970].

(32) ebe ètʃ 'monkey howling'

a. slow speech: [ebeètʃ] [˥ ˥ ˧ ˥]

b. rapid speech: [ebêtʃ] [˥ ˩˥ ˥]

Before discussing the implications of these facts for phonological theory, it is of interest to relate the question of these contour tones

to the previous question of tonal features. The Nupe examples in which the contour tone occurs if and only if the intervening consonant is voiced may seem to support the use of [-stiff, +slack] specification for both voiced consonants and low tone vowels. The copy rule would be as given in (33).

(33) $\begin{bmatrix}\text{+stiff}\\ \text{-slack}\end{bmatrix} \dashrightarrow \begin{bmatrix}\text{-stiff}\\ \text{+slack}\end{bmatrix}\begin{bmatrix}\text{+stiff}\\ \text{-slack}\end{bmatrix} \;/\; \begin{bmatrix}\text{-stiff}\\ \text{+slack}\end{bmatrix}\begin{bmatrix}\text{-stiff}\\ \text{+slack}\end{bmatrix}\;\_\_\_$

The 'tone copy' would not occur after a [+stiff, -slack] (e.g. voiceless) consonant. But since according to Halle's new features a voiced consonant has the same 'tonal' specifications as a low tone vowel, one might expect that a high tone vowel followed by a voiced consonant would phonetically be realized as a high-low fall on the preceding vowel, or a low to high or mid tone glide on the following vowel, no matter what the tone of the preceding vowel is. This, of course, is not what occurs. Furthermore, in Yoruba, Fresco [1970] and Courtenay [1968] show that the gliding rule occurs when the intervening consonant is voiceless as well as voiced, as shown in (34).

(34)	Yoruba:	a.	ɔ̀tá	[_ ⌣/]	'enemy'
		b.	àwé	[_ ⌣/]	'friend'
		c.	ɛ̀gbã́	[_ ⌣/]	'senior sibling'
		d.	ɛ̀sɔ̃́	[_ ⌣/]	'nine'

On the systematic phonetic level, without a contour tonal feature, how is <u>ètú</u> [_ ‾] in Nupe to be distinguished from <u>ɔ̀tá</u> [_ ⌣/] in Yoruba?

It seems quite obvious that the gliding pitch which occurs in some tonal sequences but not others is not predictable in the way that formant transitions are. The example given in (32) shows that even when two different tones occur on adjacent vowels level step tones are possible. Furthermore, even if some gliding occurs between two tones on adjacent vowels, on the phonetic level we must be able to distinguish between a contour tone on a single short vowel and a level tone.

If we do require some contour tonal feature for phonetic specification one may then question the hypothesis which would constrain all phonemic representations of contour tones to sequences of level tones. It seems highly unlikely that a phonetic contrast will never occur as a phonological contrast. As pointed out by Margaret Langdon [personal communication] given a phonetic contrast one can assume that historically such a contrast will or can become restructured as an underlying phonemic contrast. This is not too different from the suggestion that historically all nasal vowels derive from a sequence of vowel + nasal. To suggest that nasal vowels never occur at the systematic phonemic level contradicts synchronic facts [cf. Hyman, forthcoming].

What is being suggested here is that the universal set of features must include a feature or feature combination which will distinguish between contour tones and level tones. The particular feature(s) are discussed below, as is the question of deriving all contour tones from sequences of level tones, since the answer to the first question is dependent on the latter.

4. Segmental vs. Suprasegmental Representation of Tone

Woo's proposal [1970] that "prosodic features are segmental rather than suprasegmental" was based on the claim that all contour tones occur only when there are long vowels in the underlying forms. Maddieson [1971] points out that "both Longacre [1952] and Spears [1968] talk of syllables on which three tone phonemes or pitches appear without any mention of lengthening of the vowel. These cases include syllables of the structure CV in which C is voiceless." [p. 15] The Ibadan conference concluded "that a contrast must be made between a sequence of two (or more) 'tones' and a sequence of two (or more) pitches which form a single 'tone'. This may be done by marking one or more of the segments bearing pitch as [-syllabic]." [p. 81] They further support this conclusion by stating that this "implies that one expands the class of 'glides' and forgets the myth that non-syllabic vowels necessarily have closer tongue positions than syllabic ones." At the conference Williamson pointed out that

"in Igbo, in a sequence, close vowel + open vowel which are on different tones, both remain syllabic, whereas in the same sequence on identical tones the close vowel becomes non-syllabic." [p. 81]

Leben [1971] also shows that at least in Hausa and Mende short vowels must be specified phonologically as a High-Low sequence. The existence of 'contour' tones on short vowels (revealed by many linguists over the years, cf. e.g. Welmers, Pike, Wang, Longacre, etc.) convinced Leben that Woo's hypothesis constraining contour tones to long vowels must be abandoned. Because he and Halle [1971] wish to maintain Woo's other hypothesis, i.e. that there are no underlying contour tones, they propose that "the theory be modified so as to allow prosodic phenomena to be treated also as suprasegmental phenomena." In an attempt to justify this position Leben criticizes the hypothetical feature [+ [+High] followed by [-High]] (to represent a sequence realized as a falling tone) suggesting that "this would render Woo's hypothesis vacuous: it would permit the representation on a single segment of any sequence of level tones, regardless of whether its syllable contained a short vowel, a long vowel, or whatever. In this case the claim that contour tones are underlying sequences of level tones would become nearly empty, since the representation [+ [+high] followed by [-high]] on a segment is empirically equivalent to the representation [+falling]." [p. 14-15] If in the suprasegmental matrix posited by Leben and Halle, a sequence of [+high] [-high] is later to be mapped onto a single segment (how, is never made clear), it seems to me that this is also "empirically equivalent to the representation [+falling]." Leben further suggests that "it is not clear how the rule of tone copying could be prevented from incorrectly copying the feature [+ [+high] followed by [-high]] instead of copying the feature [-high]." It seems to be the case that in progressive 'tone copy' the final feature value is copied, whereas in regressive 'tone copy' rules the initial tonal feature is copied. By a universal convention this can certainly be specified. The rule itself can make this clear. Leben cites some examples from Mende compounds in which the following Compound Rule is posited:

(35) [Leben, 1971, p. 188]

(a) Copy the last tone of the first member of the compound onto the first syllable of the second member.

(b) Assign a low tone to the remaining syllables of the second member.

This rule accounts for the following examples:

(36) a. pɛ́lɛ́ + hanǐ = pɛ́lɛ́ -hánǐ

b. bɛ̀lɛ̀ + hanǐ = bɛ̀lɛ̀ -hànǐ

c. mbû + hanǐ = mbû -hànǐ --- mbú-hànǐ

Using the feature he rejects, one can write (35a) as:

(37) [tone] --> [αtone] / [(β tone followed by) αtone] ___

He states further that "the falling tone on mbû is converted into a high tone by tone deletion." This can be accomplished by a tone simplification rule as well as a tone deletion rule as in (38).

(38) [[+high] followed by [-high]] --> [+high]

There seems to be no formal reason why a feature such as [[+high] followed by [-high]] cannot be utilized to specify contour tones in underlying representation. It would create fewer problems than the proposal to include two matrices, one segmental and the other suprasegmental, for each surface structure, as I will attempt to show below.

One can however utilize a [-segmental] but tone bearing unit which could accomplish the same thing (as was proposed by Schachter and Fromkin [1968]) or adopt the Ibadan Conference proposal utilizing tone-bearing non-syllabic vowels. Thus, in Mende, the segmental matrices given under (39i) and (39ii) are equivalent to the suprasegmental matrices given under (39iii).

(39)

			i.	ii.	iii.
a.	mbû	'owl'	/ mbúV̀ /	/ mbúù' /	/[+h] [-h]/
b.	mbǎ	'rice'	/ mbàV́ /	/ mbàá' /	/[-h] [+h]/
c.	mbâ	'companion'	/ mbàV́V̀ /	/ mbàá'à' /	/[-h] [+h] [-h]/

(The V' represents a non-syllabic vowel.)

The number of tonal units, without segmental features, or the number of possible syllabic vowels in a string, can be restricted by morpheme structure conditions, and universally, there can be a convention which transfers the tones of the non-segmental units or non-syllabic vowels to the preceding segment. Once this is done of course, the Contour feature will also have to be added.

Leben, in keeping with the basic goals of generative phonology, is desirous of including the strongest possible constraints in the theory, thereby limiting the class of possible grammars. If, then, one solution restricts the kind of rules which can be utilized in a grammar, and if this constraint is supported by empirical evidence, this constraint should be incorporated in the general theory. He suggests that this is the case if tone is represented suprasegmentally rather than in segmental matrices, and attributes his argument to Wang [1967]. Leben states: "If tone is a feature on some entity more abstract than the segment -- such as the syllable or the morpheme -- then it is impossible to state a rule which changes the tone in an environment determined by the segments below it. This shows that the assumption that tone is expressible phonologically can serve to limit the class of phonological grammars defined by the theory in a way which cannot be done with underlying segmental features of tone." [p. 198] But this is a specious argument since Leben himself points out that "the status which the theory must give to Mandarin and Thai is that the point in the derivation at which tone is initially expressed as a segmental feature is the beginning of the derivation -- i.e. that for such languages there is no stage in the derivation at which tone is a suprasegmental feature." [p. 199] Thus, tone both is and is not a suprasegmental feature. And nowhere does either he nor Halle explain how the sequence of tones which phonetically are realized as contour tones is to be specified once such sequences are mapped onto single segments. He is correct of course in stating that this would limit the class of languages given that he is correct in stating that "if a language does not meet the narrow constraints imposed by Woo's framework, then it is subject to the constraint imposed by suprasegmental

representation: rules like (a low-tone raising rule) must be ordered after all those rules in which tone is expressed as a suprasegmental feature." [p. 199] But in the Nupe examples given above, it is clear that the tone-copying rule must depend on segmental feature specification. Thus, according to Leben, it should occur after suprasegmental information is translated into segmental information. This requires a rule assigning two tones to a single segment early in the derivation. How can this be done without a 'contour' feature or without the use of [-segmental] or [-vocalic] tone bearing units? If such a feature or such a method of representation is needed at some point in the derivation why not use it for the lexical representation? The example Leben cites from Hausa similarly involves a tone change depending on vowel length (i.e. segmental information). He does not consider the Hausa case a counter example because in this case he says that the suprasegmentals must have already been applied to the segments.

If every such counter example involves a similar early mapping, then I fail to see how the class of languages is constrained. And to repeat myself, if two tones must be applied to one segment there must be some way of doing this which can conceivable be done from the start.

Not only are there tone rules which must include segmental feature information but tone rules must also include syntactic information present in the surface structures of the string feeding into the phonological component.

In the Akan examples given above, the Vowel Deletion rule deletes all the segmental features as well as tonal features. By Leben's proposal, then, the mapping of suprasegmental matrices onto segmental matrices must occur before the Vowel Deletion rule. The Vowel Deletion rule must also occur after the Pitch Assignment and Down Drift rule. One may conclude that the mapping of suprasegmental onto segmental matrices occurs at the beginning of the derivation. The problem is complicated, however, because there are certain cases where tone is the only realization of grammatical morphemes.

In (40) Ø represents the Habitual Low tone morpheme.

(40) ɔ́ bá Ø Ghánà [ɔ́bá Ghánà] 'He comes to Ghana (habitually)'

The 'drop' tone on the first syllable of Ghana may be compared to the tone on this syllable in other contexts, as shown in (41).

(41) a. Òdwàá wɔ̀ Ghánà 'Odwaa is (located in) Ghana'
[òdwàá wɔ̀ Ghánà]

b. ŋ̀kràŋ né Ghánà àhèŋkùró 'Accra is the capital of Ghana'
[ŋ̀kràŋ né Ghánà àhèŋkùró]

To derive the 'downstep' in (40), the pitch assignment and downdrift rules must apply prior to the deletion of the 'non-segmental' low tone morpheme, as shown in (42).

(42)

	ɔ́bá	Ø	Ghánà
PA	3 1 3		1 3
DD	3 1 4		2 5
Tone Del	3 1		2 5

Since the tone is deleted in Vowel Deletion rules or when a tone occurs without any segmental features it is necessary to map (if one wishes to take this road) the suprasegmental matrices onto the segmental prior to these deletion rules, which rules must occur after the other tonal rules (e.g. PA and DD). This being the case there must be some way to represent a non-segmental tone in the segmental matrices. If we utilize the proposal of Schachter and Fromkin, that is, represent such units as [-segmental, +tone], there is no difficulty. Contour tones on short vowels may be similarly represented. All units may then be specified as [±segmental], with [-segmental] further divided into [±boundary]. [-segmental, -boundary] units will be tone bearing units

with no segmental features specified. I believe this is a better solution than the proposal by the Ibadan Conference which would represent such units as [-syllabic, +tone] vowels, since in the case of grammatical morphemes such as the above, it would be stretching a point to specify this vowel as the least marked vowel /a/ which, as in the case of the Akan Habitual, is never realized on the surface. If it was possible to avoid the mapping of the suprasegmental matrices onto the segmental matrices then there might be some point in including two distinct matrices. But since the examples from Hausa, Nupe, Akan, etc. force us to treat the tonal features segmentally, interacting with segmental features, and requiring syntactic information for the correct application of tone rules, I cannot see that the new proposal has any merit. In fact, since the motivation for the new Halle/Stevens features was to use identical features for vowel tone and consonantal glottal strictures, the proposal to then separate these features into two matrices seems rather unwarranted.

A contour tone in an underlying matrix may then be represented as in (43):

(43) a. $\begin{bmatrix}+h\\+seg\end{bmatrix}\begin{bmatrix}-h\\-seg\end{bmatrix}$ = falling tone $\wedge$

b. $\begin{bmatrix}-h\\+seg\end{bmatrix}\begin{bmatrix}+h\\-seg\end{bmatrix}$ = rising tone $\vee$

c. $\begin{bmatrix}-h\\+seg\end{bmatrix}\begin{bmatrix}+h\\-seg\end{bmatrix}\begin{bmatrix}-h\\-seg\end{bmatrix}$ = convex tone $\vee\wedge$

By a universal convention any sequence of two or more tone bearing units, in which the first is [+segmental] and the second (and third) is [-segmental] will be further specified by adding the feature [+contour] to all such units. In other words this kind of representation can be the formal way of specifying contour tones. In a language such as Yoruba, the 'gliding' rule can be stated as (44).

(44) [tone] $\dashrightarrow$ [αtone] $\begin{bmatrix}-\alpha tone\\-seg\end{bmatrix}$ / [αtone] ___

where, if α = [+H], - α = [+L]

and, if α = [+L], - α = [+H]

Once the feature Contour is available, it will also be possible to utilize this feature in languages where tone copy rules do not occur. Schane [personal communication] has observed that since there are tone languages in which only register, level tones occur, but no tone languages in which only contour tones occur, register tones take precedence in the hierarchy; that is, the Contour feature can only be used if there are tones without the contour feature. Furthermore, a tone represented as [+high, +contour] will then specify a 'rising' tone, one represented as [-high, +contour] or [+low, +contour] will specify a 'falling' tone, and one represented as [+high, -high, +contour] will specify a 'convex' tone. By a universal convention, a progressive tone copy rule will copy the specified [+high] of a preceding contour tone, whereas a regressive tone copy rule will copy the opposite value of the following contour tone. The convention can be stated as in (45).

(45)

$$\text{Tone} \longrightarrow \begin{bmatrix} [\alpha H] \;/\; \begin{bmatrix} \alpha H \\ +\text{contour} \end{bmatrix} \_\_ \\ [-\alpha H] \;/\; \_\_ \begin{bmatrix} \alpha H \\ +\text{contour} \end{bmatrix} \end{bmatrix}$$

Using these conventions it is possible to represent all contour tones in the lexicon without resorting to the [-segmental] units. For non-segmental tonal units which represent grammatical morphemes in the surface structure however, the [-segmental, +tone] units may still be necessary.

5. Conclusion

The above discussion on tonal features and tonal rules has attempted to show (a) that the features Stiff Vocal Cords and Slack Vocal Cords for both vowel tones and glottal states are inadequate and should not be adopted; (b) that three features for tones High Mid Low prove to be the best yet proposed (whether High and Low are called Raised and Lowered is immaterial) since the use of the feature Mid permits specification of a mid tone either as 'closer' to High, or to Low or 'intermediate'; (c) that a contour tonal feature is necessary for descriptively adequate phonetic representations; and (d) that the inclusion of suprasegmental

matrices for tonal specification in surface structures does not resolve the problem of poly-tones (or contour tones) on one segment -- it merely places the problem in a different part of the grammar.

REFERENCES

Bird, C. S. 1971. "Observations on initial consonant change in Southwestern Mande," in Papers in African Linguistics, pp. 153-174. Edited by Chin-Wu Kim and Herbert Stahlke. Edmonton, Alberta and Champaign, Illinois: Linguistic Research, Inc.

Chomsky, N. 1967. "The formal nature of language," Appendix A of E. Lenneberg, Biological Foundations of Language. New York: John Wiley and Sons.

Chomsky, N. and M. Halle. 1968. The Sound Pattern of English. New York: Harper and Row.

Courtenay, K. 1968. A Generative Phonology of Yoruba. Unpublished doctoral dissertation, University of California, Los Angeles.

Fresco, E. M. 1970. Topics in Yoruba Dialect Phonology. Supplement 1 of Studies in African Linguistics.

George, I. 1970. "Nupe tonology." Studies in African Linguistics 1.1:100-122.

Gruber, J. S. 1964. "The distinctive features of tone." Unpublished manuscript.

Halle, M. 1971. "Theoretical issues in phonology in the 1970's." Paper delivered to the 7th International Congress of Phonetics, August, 1971. Montreal, Canada.

Halle, M. and K. N. Stevens. 1971. "A note on laryngeal features." Quarterly Progress Report No. 101, pp. 198-213, Research Laboratory of Electronics. Cambridge: Massachusetts Institute of Technology.

Hyman, L. "Nasals and nasalization in Kwa." (forthcoming)

Johnson, C. J. 1970. "Formal aspects of phonological description," POLA No. 11. Berkeley: University of California

Kiparsky, P. 1968. "How abstract is phonology." Unpublished paper.

Ladefoged, P. 1963. "Some physiological parameters in speech." Language and Speech 6.3:109-119.

Ladefoged, P. 1964. "The vocal cords," in Research Potentials in Voice Physiology, pp. 246-252. Edited by D. Brewer. New York: State University of New York.

Ladefoged, P. 1967. "Research possibilities in phonetics." Annual Bulletin 1:31-34, Research Institute of Logopedics and Phoniatrics, University of Tokyo.

Ladefoged, P. 1971a. "Three glottal features." Paper presented to the 82nd meeting of the Acoustical Society of America. Denver, Colorado.

Ladefoged, P. 1971b. Preliminaries to Linguistic Phonetics. Chicago: University of Chicago Press.

Leben, W. R. 1971. "Suprasegmental and segmental representation of tone." Studies in African Linguistics, Supplement 2:183-200.

Lisker, L. and A. S. Abramson. 1971. "Distinctive features and laryngeal control." Language 47.4:767-785.

Longacre, R. E. 1952. "Five phonemic pitch levels in Trique." Acta Linguistica 7:62-68.

Maddieson, I. 1971. "The inventory of features." Research Notes 3:3-18. Ibadan: University of Ibadan.

Maddieson, I., editor. 1971. "Tone in generative phonology." Research Notes 3:parts 2 and 3. Ibadan: University of Ibadan.

Maran, La Raw. 1968. "Glottal features." Unpublished manuscript, Massachusetts Institute of Technology.

Ohala, J. 1970. "Aspects of the control and production of speech." Working Papers in Phonetics 15. Los Angeles: University of California.

Sampson, G. 1969. "A note on Wang's phonological features of tone." IJAL 35:62-66.

Schachter, P. 1969. "Natural assimilation rules in Akan." IJAL 35:342-355.

Schachter, P. and V. A. Fromkin. 1968. "A phonology of Akan: Akuapem, Asante, and Fante." Working Papers in Phonetics 9. Los Angeles: University of California.

Spears, R. 1968. "Tonal dissimilation in Maninka." Journal of African Languages 7:88-100.

Stewart, J. M. 1962. An Analysis of the Structure of the Fante Verb. Unpublished doctoral dissertation, University of London.

Stewart, J. M. 1965. "The typology of the Twi tone system." Legon: Institute of African Studies.

Voegelin, C. F. and F. M. Voegelin. 1965. "Languages of the world: Sino-Tibetan Fascicle 3." Anthropological Linguistics 7.4.

Wang, W. S.-Y. 1967. "Phonological features of tone." IJAL 33:93-105.

Welmers, W. 1959. "Tonemics, morphotonemics, and tonal morphemes." General Linguistics 4:1-9.

Welmers, W. African Language Structures. (forthcoming)

Williamson, K. 1971. "Downdrift/downstep." Research Notes 3. Ibadan: University of Ibadan.

Woo, N. 1967. "A marking system for prosodic features." Unpublished paper.

Woo, N. 1968. "Tones and Vowel Length." Unpublished paper.

Woo, N. 1969. Prosody and Phonology. Doctoral dissertation, Massachusetts Institute of Technology.

Woo, N. 1970. "Tone in Northern Tepehuan." IJAL 36:18-30.

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CONSONANT ALTERNATION IN FULA[1]

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1. Introduction

The suffixes that are added to nouns in Fula occur in pairs. For example, the noun stem ƭummu 'calabash' takes the suffix pair (de,ɗe).[2] The singular form of this noun is formed by suffixing de to the noun stem, giving ƭummude. The plural form of this noun, ƭummuɗe, is formed by adding the other suffix, ɗe, to the noun stem. A given noun stem can only occur with a given pair of suffixes, so that ƭummu always occurs with the suffix pair (de,ɗe) and never with a pair such as (gol,ɗi). The noun stem ƭādor 'belt', on the other hand, occurs with this pair; ƭādorgol is the singular form, ƭādorɗi is the plural form. Of course, ƭādor never takes any other suffix pair besides (gol,ɗi).

Some of the suffixes have semantic content. For example, the suffix pair (ɗo,ɗe) always occurs with nouns that refer to human beings, such as jaggoƭō 'servant', lāmī 'king', maccu 'slave', and so on. Another suffix pair (gel,kon) has a diminuative sense. Thus, from the stem peɗir 'head', we have peɗirgel 'a small head' and peɗirkon 'small heads'.

With certain nouns the initial consonants of the suffixes vary. This variation is referred to as suffix alternation. Similarly, the initial consonants of stems can vary, depending on the suffix added to the stem. This type of variation is referred to as stem alternation. Traditional analyses of consonant alternation in the Fula noun system have implicitly calimed that suffix alternation is different from stem alternation. Suffix alternation appears to consist of four types or grades: a

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[1]I would like to thank Herb Stahlke for his helpful comments on this paper.

[2]The data used in this article is from Klingenheben [1963]. His work is a description of the Adamawa dialect of Fula. Klingenheben represents pre-nasalized consonants with the form ᶇ. This notation is used throughout this paper. Klingenheben also uses ɟ and c to represent the voiced and voiceless palatal stops in Fula.

continuant grade, a stop grade, a nasal grade, and a zero grade. The initial consonant of the suffix can appear in four different forms, depending on the stem to which the suffix is attached. In the zero grade, the initial consonant of the suffix has been deleted. In stem alternation, the zero grade does not appear; the initial consonant of the stem can take the other three grades, but the initial consonant is never missing as in suffix alternation.

In this paper I will argue that suffix alternation is indeed the same as stem alternation and that the suffixal zero grade is really a form of the continuant grade. Traditional analyses have also postulated that the continuant grade is the basic, underlying grade. I will argue, to the contrary, that the stop grade is the basic grade and that the continuant grade is derived from the stop grade. Finally, having shown that suffix and stem alternation are essentially the same, I will consider how morphemes in Fula should be specified for consonant alternation.

2. Suffix alternation

Depending upon the particular stem, the suffix may take a zero grade, a continuant grade, a stop grade, or a nasal grade. Consider the pair of suffixes (de,δe). These suffixes take the following forms for each of the given grades:

(1)	zero	re	e
	continuant	re	je
	stop	de	δe (~le)
	nasal	d̰e	δe (~le)

The stems new and ƴoy take the zero forms of de and δe:

(2a)	new-	'palm (of the hand)'	newre	newe
	ƴoy-	'craftiness'	ƴoyre	ƴoye

Examples of stems taking the continuant form of the suffixes are:

(2b)	tapā-	'cliff'	tapāre	tapāje
	dūjī-	'owl'	dūjīre	dūjīje
	jammō-	'surname'	jammōre	jammōje

With this pair of suffixes we can distinguish between those stems taking the stop form de and those taking the nasal form ɲde. First, some examples of stems taking de:

(2c)	ʈummu-	'calabash'	ʈummude	ʈummuδe
	durdu-	'pasturage'	durdude	durduδe
	jaŋɲgir-	'school'	jaŋɲgirde	jaŋɲgirδe
	naŋɲgar-	'peat for religious washings'	naŋɲgarde	naŋɲgarδe
	ɲal-	'24-hour day'	ɲalde	ɲalδe
	lōʈir-	'soap'	lōʈirde	lōʈirδe
	ɓirdu-	'milking pail'	ɓirdude	ɓirduδe

Now some examples taking the nasalized form ɲde:

(2d)	ʈī-	'forehead'	ʈīɲde	ʈīδe
	dar-	'position'	darɲde	darδe
	lay-	'forest'	layɲde	layδe
	ɓer-	'heart'	ɓerɲde	ɓerδe
	ʔin-	'name'	ʔinɲde	ʔinδe

For some speakers, there is a variant le of the plural suffix δe; for example, stems taking the nasal grade of the suffix sometimes take this variant form:

(3)	ɲamā-	'debt'	ɲamāɲde	ɲamāle
	ʔiyē-	'rain'	ʔiyēɲde	ʔiyēle

There are a large number of singular suffixes which occur with the plural suffix δe or with the variant δi, which is apparently replacing the older δe.[3] The plural suffix δi alternates just like δe:

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[3]For example, with the singular suffix go, " ... in älteren Formen nach der δe- und in jungeren meist nach der δi-Klasse" [Klingenheben 1963:73]. In words taking the singular suffix gol, the plural suffix δi is found in continuous speech, the archaic form δe in the pronunciation of the isolated word [Klingenheben 1963:88].

(4)	zero	i
	continuant	ji
	stop	δi (~li)
	nasal	δi (~li)

The singular suffix goi occurs with the plural suffix δi. We have the following examples of each of the grades:

(5a)					
	zero	lēɓ-	'butter'	lēɓoi	lēɓi
		mah-	'wall'	mahoi	mahi
	continuant	bilē-	'large feather'	bilēwoi	bilēji
		mētalē-	'turban'	mētalēwoi	mētalēji
	stop	tādor-	'belt'	tādorgoi	tādorδi
		bin̰dir-	'pen'	bin̰dirgoi	bin̰dirδi
	nasal	goŋ-	'tears'	goŋ̰goi	gonδi[4]
		dāŋ-	'tether for calf'	dāŋ̰goi	dānδi

From these examples, we notice that goi alternates as follows:

(6)	zero	oi
	continuant	woi
	stop	goi
	nasal	g̰oi

A couple examples of where li replaces δi are:

(7)				
	cūm-	'snout'	cūmgoi	cūmli
	jomor-	'tax'	jomorgoi	gomorli

Now consider the pair of suffixes (δo,ɓe), which alternate as follows:

(8)	zero	o	ɓe
	continuant	jo (~wo)	ɓe
	stop	δo	ɓe
	nasal	δo	ɓe

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[4]The velar nasal is assimilated to the initial implosive of the suffix.

The suffix ɓe is invariable for all of the grades. Consider the stem ɓur 'director'. This stem takes suffixes in the zero grade. Thus, the singular form is ɓuro and the plural is ɓurɓe. Examples of stems taking the continuant grade of suffixal alternation are as follows:

(9a)	ʔalajī-	'pilgrim to Mecca'	ʔalajījo	ʔalajīɓe
	nayē-	'old man'	nayējo	nayēɓe
	sōbā-	'friend'	sōbājo	sōbāɓe

If a stem that takes the continuant grade of the suffix ɗo ends in ō, then wo is added instead of jo:

(9b)	defō-	'cook'	defōwo	defōɓe
	jaŋgi̱nō-	'teacher'	jaŋgi̱nōwo	jaŋgi̱nōɓe
	ƭigō-	'merchant'	ƭigōwo	ƭigōɓe
	lōƭō-	'washerwoman'	lōƭōwo	lōƭōɓe
	ɲōƭō-	'tailor'	ɲōƭōwo	ɲōƭōɓe
	ɓa̱rō-	'murderer'	ɓa̱rōwo	ɓa̱rōɓe

A couple of stems ending in ā also take wo instead of jo:

(9c)	sōbirā-	'friend'	sōbirāwo	sōbirāɓe
	hammirā-	'older brother'	hammirāwo	hammirāɓe

Examples of stems taking the stop grade ɗo are as follows:

(10)	jaggoƭō-	'servant'	jaggoƭōɗo	jaggoƭōɓe
	lāmī-	'king'	lāmīɗo	lāmīɓe
	maccu-	'slave'	maccuɗo	maccuɓe

For this particular pair of suffixes the nasalized grade is indistinguishable from the stop grade.

Without giving any more examples, consider the alternations that the other suffixes can take:

(11)	zero	ru	e	o	o	al	i	ol	um	ri
	continuant	ru	ye	wo	ho	wal	hi	hol	jum	ri
	stop	du	ge	go	ko	gal	ki	kol	ɗum	di
	nasal	ḏu	g̱e	g̱o	ko	g̱al	ki	kol	ɗum	ḏi

zero	a	a	u	a	am	el	um	al	on
continuant	wa	wa	wu	ha	jam	yel	wum	hal	hon
stop	ga	ba[5]	gu	ka	ɗam	gel	gum	kal	kon
nasal	g̃a	b̃a	g̃u	ka	ɗam	g̃el	g̃um	kal	kon

We can summarize the alternations of the suffixes in terms of the initial consonant of the suffix:

(12)								
zero	-	r	-	-	-	ɓ	-	
continuant	w	r	w	y	h	ɓ	j	(~w)
stop	b	d	g	g	k	ɓ	ɗ	(~l)
nasal	b̃	d̃	g̃	g̃	k	ɓ	ɗ	(~l)

g alternates with w if the vowel of the suffix is a back vowel; g alternates with y if the vowel of the suffix is a front vowel. Thus, the suffixes ge and gel have the continuant forms ye and yel. The continuant forms of the suffixes go, gal, gol, ga, gu, and gum all begin with w. In addition, we notice that only voiced stops can be nasalized; the voiceless stop k and the implosives ɓ and ɗ cannot be nasalized.

One interesting distributional fact is that if a stem ends in a nasal that is homorganic to the initial stop of the suffix, then the suffix will end up in the nasalized grade instead of the stop grade. For example:

(13)				
ʔen-	'breast'	ʔend̃u	ʔenɗi
ʔin-	'name'	ʔind̃e	ʔinɗe
goŋ-	'tears'	goŋg̃ol	gonɗi
dōŋ-	a type of load	dōŋg̃al	dōŋle
ƭeŋ-	'louse'	ƭeŋg̃u	ƭenɗi
dāŋ-	'tether for calf'	dāŋg̃ol	dānɗi
ƭon-	'lip'	ƭond̃u	ƭonɗi

The stem-final nasal does not necessarily assimilate to the suffix-initial stop. In such cases, the stem can take suffixes in the stop grade. For example:

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[5]An older singular suffix ba is still found in western dialects of Fula. This form is the remnant of an older class of words [Klingenheben 1963:100].

(14)	lim-	'number'	limgal	limle
	cūm-	'snout'	cūmgol	cūmli
	jaŋ-	'lesson'	jaŋde	jaŋle

But of course stems like these can appear in the nasal grade too, just like stems ending in non-nasal segments:

(15)	ɓem-	'tongue'	ɓemgal	ɓemɓe
	dim-	a type of load	dimgal	dimle
	tī-	'forehead'	tīde	tīɓe

In other words, there are many stems that take the nasalized form of the suffix without any phonetic condition. But stems ending in a nasal homorganic to the initial consonant of the suffix may take suffixes in the nasal grade because of a phonetic rule of nasalization:

(16) $\begin{bmatrix} +\text{cons} \\ -\text{cont} \\ +\text{vcd} \\ \alpha F \end{bmatrix} \rightarrow [+\text{nasal}] \; / \; \begin{bmatrix} +\text{nasal} \\ \alpha F \end{bmatrix} + \_\_$

Within morphemes voiced stops following nasals must be nasalized, even if the segments are non-homorganic:

(17)	jambō-	'betrayer'
	jaŋginō-	'teacher'
	kandond-	'chain'
	ɲāmdu-	'food'
	?injin-	'machine'

Thus the nasal assimilation is more general within morphemes:

(18) $\begin{bmatrix} +\text{cons} \\ -\text{cont} \\ +\text{vcd} \end{bmatrix} \rightarrow [+\text{nasal}] \; / \; [+\text{nasal}] \; \_\_$

Finally, let us consider the zero grade. Nearly all those that have investigated Fula have claimed that the zero grade is an independent grade. But if we consider what kinds of stems take the zero grade of the suffix, we note that they all end in a consonant:

(19)	ɓur-	'director'
	new-	'palm (of the hand)'
	ỷoy-	'craftiness'
	lēb-	'butter'
	mah-	'wall'

Nearly all the stems taking the continuant grade of the suffix end in a vowel:

(20)	?alajī-	'pilgrim to Mecca'
	nayē-	'old man'
	sōbā-	'friend'
	defō-	'cook'
	jaŋg̰inō-	'teacher'
	tigō-	'merchant
	lōtō-	'washerwoman'
	ɲōtō-	'tailor'
	ḇ̰arō-	'murderer'
	sōbirā-	'friend'
	hammirā-	'older brother'
	tapā-	'cliff'
	dūjī-	'owl'
	jammō-	'surname'
	bilē-	'large feather'
	mētalē-	'turban'

Except for the alternation of the implosive ɓ, the only difference between the zero grade and the continuant grade is that a glide (w, y, or h) has been deleted in the zero grade. The sonorant r occurs in both grades. Let us postulate a rule that will delete glides when preceded by a stem-final consonant:

(21) $$\begin{bmatrix}-\text{cons}\\-\text{syll}\end{bmatrix} \longrightarrow \emptyset \;/\; [-\text{syll}] + \underline{\quad}$$

Now we can claim that there are actually only three grades in suffix alternation and that the zero grade arises because of a rule deleting a glide preceded by a stem-final consonant.

There are some exceptions to this generalization. Consider a stem like yakatab, a type of shoe, which takes the continuant form of the suffix pair (go,δe), or a stem like pampam 'empty peanut shell', which takes the continuant form of the suffix pair (gu,δi):

(22) yakatabwo yakatabje
pampamwu pampamji

We do not get the expected forms *yakatabo and *yakatabe, or *pampamu and *pampami. Perhaps the w fails to delete in this environment because the preceding consonant (b or m) is labial. There are a few examples where j has failed to delete before a consonant, as in:

(23) merlem- a type of frog merlemru merlemji

rather than *merlemi. Nonetheless, it is a fact that every stem that does take the zero grade ends in a consonant, while the great majority of stems taking the continuant grade end in a vowel.

The alternation of the implosive δ is highly irregular. Although the other implosive, ɓ, never alternates, δ does. In addition, δ alternates in the continuant grade with a palatal stop, j, rather than with a continuant. We did notice, however, that with stems taking the singular suffix δo and ending in a back vowel (ō and sometimes ā), the back glide w showed up instead of j. This peculiar behavior of δ suggests that the dental implosive actually alternates with a front glide, and that this front glide can be changed to the back glide w in the environment of two back vowels, as in the examples:

(24) defō + δo ==⇒ defōwo
sōbirā + δo ==⇒ sōbirāwo

If the continuant form of δ actually is a glide, we can also explain why the zero grade of δ is null. According to our rule of glide deletion, a glide produced from δ could be deleted before a stem-final consonant. The glide would remain if the stem taking the continuant form of δ ended in a vowel. In this case, the glide would be realized as the palatal stop j unless it occurred between two back vowels. Note that

this glide would be voiced and palatal. The crucial change then would be to simply make a stop out of the glide y.

In summary, every stem takes a certain pair of suffixes. A stem will be marked for taking the continuant, the stop, or the nasal form of the suffix. If a stem ends in a consonant and takes the continuant form of the suffix, the initial continuant of the suffix will be deleted if it is a glide. There are only three grades of suffix alternation, not four.

3. Stem alternation

Not only does the initial consonant of the suffix alternate, but in a similar way, the initial consonant of the stem itself can alternate, depending on the suffix that is added to the stem. Just as there are stems that always take the continuant (or zero) grade of the suffix, there are suffixes that take stems beginning with a continuant. Similarly, there are suffixes that occur with stems having stops in initial position. For example, consider the pair of suffixes (de,ðe). The singular suffix de takes stems in the continuant grade. The other suffix, ðe, takes stems in the stop form. Consider the following alternations of stems that take this pair of suffixes:

(25)	f ~ p	fijirde	pirjirðe	'playground; game'
	w ~ b	wawarde	bawarðe	'shield'
	r ~ d	ramde	damðe	'billy goat'
	s ~ c	sāgorde	cāgorðe	'forearm'
	y ~ j	yardude	jarduðe	'drinking place'
	h ~ k	harɓāde	karɓāðe	'hip joint'
	y ~ g	yettōre	gettōje	'gratitude'
		yimre	gime	'song'
		yelemre	geleme	'calf (of the leg)'
	w ~ g	wāyre	gāye	'itch'
		wonorde	gonorðe	'home'
		wamrude	gamruðe	'dancing place'
		wasarde	gasarðe	'mine'

Like the suffix alternation of g, the stem-initial g alternates with the front glide y if the following vowel is a front vowel; g alternates with the back glide w if the following vowel is a back vowel.

Similarly, there are suffixes that take stems with nasalized initial consonants. For example, consider some stems that occur with the pair of suffixes (gu,ɗi); the singular suffix gu takes stems in the nasalized grade and ɗi takes stems in the stop grade:

(26)	b̰ ~ b	b̰irīwu	birīji	'peanut'
	d̰ ~ d	d̰ūɓu	dūɓi	'year'
	j̰ ~ j	j̰agāwu	jagāji	'lion'
	g̰ ~ g	g̰il̰gu	gilɗi	'worm'

Voiceless stops, on the other hand, cannot be nasalized:

(27)	p ~ p	puccu	pucci	'horse'
	ƭ ~ ƭ	ƭeŋgu	ƭenɗi	'louse'
	c ~ c	cirgu	cirɗi	'leopard'
	k ~ k	kaywāwu	kaywāji	'leather sack'

We also noticed that the suffixes beginning with a voiceless stop were never nasalized by suffix alternation.

Suffix alternation never applied to the implosive consonant in the suffix ɓe. Likewise, stem alternation never affects words beginning with ɓ. The continuant form of ɓ is also ɓ:

(28)	ɓirdu-	'milking pail'	ɓirdude	ɓirduɗe
	ɓer-	'heart'	ɓer̰de	ɓerɗe

Likewise, the nasalized grade of ɓ remains unchanged:

(29)	ɓog̰-	'mosquito'	ɓog̰u	ɓog̰i

There are, in fact, other consonants that do not alternate. For example, the voiceless dental stop, ƭ, does not alternate with a continuant form:

(30)	ƭ ~ ƭ	ƭiŋg̰ē-	'onion'	ƭiŋg̰ēre	ƭiŋg̰ēje
		ƭummu-	'calabash'	ƭummude	ƭummuɗe
		ƭī-	'forehead'	ƭḭ̄de	ƭīɗe

Glottal stops, nasals, liquids, nasalized stops, and implosives are also not affected by stem alternation:

(31)

continuant	stop				
ʔ	ʔ	ʔin-	'name'	ʔinde	ʔinɗe
m	m	maccu-	'slave'	maccuɗo	maccuɓe
n	n	naŋgar-	'peat for religious washings'	naŋgarde	naŋgarɗe
ɲ	ɲ	ɲal-	'24-hour day'	ɲalde	ɲalɗe
l	l	lōtir-	'soap'	lōtirde	lōtirɗe
ɓ	ɓ	ɓarō-	'murderer'	ɓarōwo	ɓarōɓe
ɗ	ɗ	ɗowtā-	'obedience'	ɗowtāre	---
ʼy	ʼy	ʼyoy-	'craftiness'	ʼyoyre	ʼyoye

(32)

nasal	stop				
ʔ	ʔ	ʔasgum-	'cock'	ʔasgumri[6]	ʔasgumje
m	m	mōʔ-	'termite'	mōʔu	mōʔi
n	n	nor-	'crocodile'	norwa[6]	norji
ɲ	ɲ	ɲākurē-	'small horse-fly'	ɲākurēwu	ɲākurēji
l	l	lel-	'gazelle'	lelwa	lelji

Thus the only segments that alternate are the simple stops p, b, d, k, and g. All of the simple stops except t may alternate with a corresponding continuant, and only voiced simple stops may alternate with a nasalized stop.

In those stems in which stem alternation takes place, what is the underlying initial consonant? Klingenheben [1963:12,25], Arnott [1970:48], and Sapir [1970:69] have noted that the alternation can in general be accounted for if underlying continuants rather than underlying stops are postulated for those stems that alternate. The basis for this claim is that Fula contains a large number of stems whose initial stops, like t, do not alternate. For example:

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[6]The singular suffixes di and ga take stems in the nasalized grade.

(33)	battā-	'leather box'	battāru	battāji
	defō-	'cook'	defōwo	defōβe
	dūjī-	'owl'	dūjīre	dūjīje
	jammō-	'surname'	jammōre	jammōje
	jūlir-	'mosque'	jūlirde	jūlirδe
	kurfu-	'boot'	kurfuwo	kurfūji[7]

Suppose that the continuants are underlying in stems that are affected by stem alternation, and that we postulate a rule that will change continuants to stops depending on the type of suffix added to the stem. Then we could claim that in such words as tiŋge, battā, defō, jammō, and kurfu the stops were all underlyingly present. In this case, the rule of stem alternation would not affect underlying stops, only underlying continuants; and thus stems with underlying stops would never alternate.

However, there are also a number of exceptions with continuants as well. Non-alternating continuants do show up where stops should occur; for example:

(34)	sōbā-	'friend'	sōbājo	sōbāβe
	sōbirā-	'friend'	sōbirāwo	sōbirāβe
	hammirā-	'older brother'	hammirāwo	hammirāβe
	hamilā-	'sword belt'	hamilāwol	hamilāji
	yakatab-	a type of shoe	yakatabwo	yakatabje
	sōro-	a type of house	sōrowol	sōrōji
	suka	'small young man'	sukayel	sukahon

In addition, there are loan words that have initial continuants that do not alternate:

(35)	suley-	'shilling'	suleyre	suleyje
	sōje-	'soldier'	sōjējo	sōje?en
	hayru-	'luck'	hayru	hayrūji
	hakīka-	'truth'	hakīka	hakīkāji
	fōto-	'photograph'	fōto	fōtōji

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[7] V --> V̄ / ___ j .

Such words generally do not add any singular suffix, but do have the continuant form occurring with the plural suffix ði, which is supposed to occur with stems in the stop grade. There are a large number of re-analyzed nouns in the language which fit into this pattern. For example, consider the noun saɓɓo 'nest' which originally had the plural form caɓɓe. Re-analysis has taken place, and a new plural saɓɓōji has replaced the older form caɓɓe. Other examples show that such nouns can begin with continuants as well as stops:

(36)			
	'palace'	fāda	fādāji
	'game'	waɲɲo	waɲɲōji
	'end'	ragare	ragarēji
	'hour'	sā?a	sā?āji
	'hope'	yela	yelāji
	'wonder'	hayðēgam	hayðēgamji
	'word'	kalma	kalmāji
	'farm in suburbs'	ciraka	cirakāji
	'luck'	barka	barkāji
	'trick'	dabare	dabarēji
	'ability'	gikku	gikkūji
	'wrong'	jambaa	jambāji
	'pencil'	pensur	pensurji
	'plague'	ƭorra	ƭorrāji

There is another pattern of suffixes that admits underlying continuants as well as stops. This is exemplified by sōje 'soldier', a loan word from English. The singular form is sōjējo, the plural is sōje?en. Again, both unalternating continuants and stops can fit into this pattern:

(37)				
	fādawa-	'courtier'	fādawājo	fādawa?en
	wajīri-	'minister'	wajīri[8]	wajīri?en
	sarāki-	'official'	sarākījo	sarāki?en
	yaƭīme-	'orphan'	yaƭīmējo	yaƭīme?en
	hawsa-	'Hausa'	hawsājo	hawsa?en

[8]Sometimes the jo suffix is deleted.

gāji	'youngest one'	gāji/gājījo	gāji?en
jāwar-	'widow'	jāwarjo	jāwar?en
ƭalaka-	'poor person'	ƭalakājo	ƭalaka?en
bigawla-	'chief slave'	bigawla/ bigawlājo	bigawla?en
derke-	'child'	derke/derkējo	derke?en
kila-	'smith'	kila/kilājo	kila?en

All of these examples indicate that the tendency in Fula is to eliminate stem alternations. There are a large number of stems beginning with both stops and continuants that do not alternate. Recent loan words do not alternate. The rule that is responsible for stem alternation must be an exceptional rule in the sense that a stem must be marked as [+ STEM ALTERNATION] in order for alternation to occur, and that the unmarked or expected case in Fula is that stems are [- STEM ALTERNATION]. In any event, we cannot use the lack of consonant alternation in certain words to account for the type of underlying consonants in words that do show alternation.

One especially striking fact is that if a stem does alternate for a given pair of suffixes, then one of the forms must be in the stop grade. Thus, we can find the following types of alternation:

(38)

singular	plural	example pair of suffixes
stop	continuant	(ɗo,ɓe)
continuant	stop	(de,ɗe)
nasal	stop	(gu,ɗi)
stop	nasal	(gel,kon)

But we never find in noun stems an alternation between the continuant and the nasal form. In other words, if a stem alternates, the stop form always shows up. With some suffix pairs, the other form of the stem will be in the continuant grade. With other suffixes, it will be a nasalized stem. But the stop form will always manifest itself in a surface form.

Let us postulate then two simple rules, one to change stem-initial stops to continuants when they occur with certain suffixes (continuant-producing suffixes), and the other to nasalize voiced stops when they

occur with certain other suffixes (nasal-producing suffixes):

(39) $\begin{bmatrix}+\text{cons}\\-\text{cont}\\+\text{vcd}\end{bmatrix} \rightarrow [+\text{nasal}] \;/\; [\_\_X]_{\text{stem}} + \text{N-suffix}$

(40) $\begin{bmatrix}+\text{cons}\\-\text{cont}\end{bmatrix} \rightarrow [+\text{cont}] \;/\; [\_\_X]_{\text{stem}} + \text{C-suffix}$

The rule of stem alternation that produces continuants can explain the alternation of g. As we have seen, g --> w occurs before back vowels and g --> y before front vowels. We also have the unconditioned alternations b --> w and j --> y irrespective of the following vowel. If the stops b, g, and j are postulated as the underlying segments, we can easily predict which glide will alternate with which stop. But if the glides are the underlying segments, one cannot wholly predict which stops alternate with a given glide. For example, w can alternate with g or b if w is followed by a back vowel:

(41)	'shield'	wawarde	bawarðe
	'mine'	wasarde	gasarðe

The verb is also affected by stem alternation. For example, after the first person plural pronoun miN 'we', a verb in the past tense will begin with a nasalized stop, but after the first person singular pronoun mi 'I', the verb will be in the continuant grade:

(42)	bōð-	'to be pretty'	mi wōði	mim ᵬōði
	gar-	'to come'	mi wari	miŋ g̃ari
	jeh-	'to go'	mi yehi	miɲ j̃ehi
	gett-	'to thank'	mi yetti	miŋ g̃etti
	dem-	'to plough'	mi remi	min d̃emi
	piδ-	'to shoot'	mi fiδi	mim piδi
	com-	'to be tired'	mi somi	miɲ comi
	keɓ-	'to receive'	mi heɓi	miŋ keɓi

According to Klingenheben [1963:12], there is a nasal assimilation rule in Fula that will change a continuant to either a voiced nasal stop or a voiceless non-nasal stop. Klingenheben postulates that the continuous

segments are underlying and that his nasal assimilation rule will convert, for example, y --> j in the stem yeh 'to go', but with the stem yett 'to thank', y --> g. Since in both stems the vowel following the front glide is a front vowel, there is no way to predict which rule, y --> j or y --> g, should apply to these given stems. Thus Klingenheben is forced to indicate which stop alternates with the glide for some stems with an initial glide.[9] But if we postulate underlying stops, the glides are completely determined by our rule of stem alternation. We simply say that the rule of stem alternation that produces continuants applies to the verb stem in the first person singular past tense. The fact that in the first person plural the verb stem takes initial stops in the nasalized grade can be explained by our more general nasalization rule. The final nasal in miN 'we' is first made homorganic to the initial consonant of the verb stem:

(43) $[+\text{nasal}] \rightarrow [\alpha F] \; / \; \_\_\_ + \begin{bmatrix} +\text{cons} \\ \alpha F \end{bmatrix}$

and then voiced stops are nasalized across the morpheme boundary:

(44) $\begin{bmatrix} +\text{cons} \\ -\text{cont} \\ +\text{vcd} \\ \alpha F \end{bmatrix} \rightarrow [+\text{nasal}] \; / \; \begin{bmatrix} +\text{nasal} \\ \alpha F \end{bmatrix} + \_\_\_$

This rule is the same rule that accounts for the suffix alternation of stems ending in a nasal homorganic to the suffix-initial consonant (cf. rule (16)). The fact that the stem-initial stop of the verb stem in mim b̰oδi is nasalized can be accounted for by a very general nasalization rule.

Our rules of stem alternation are, in fact, the same rules that we need to account for suffix alternation. We have seen that suffix alternation consists of three basic grades instead of four, that the zero grade is really derived from the continuant grade by a glide-deletion

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[9] "Angesichts dieser Verschiedenheiten empfiehlt es sich, bei der Anführung von mit w und y anlautenden Wurzeln durch hinzugesetztes b, g, oder j anzudeuten, zu welcher Permutationsreihe sie gehören...." [Klingenheben 1963:25]. For a similar solution, cf. Arnott [1970:48].

rule (rule (21)). In fact, the same three grades are found in stem alternation. Except for the dental implosive, ɗ, all the suffix alternations are exactly the same as the corresponding stem alternations:

(45)

continuant	w	r	w	y	h	ɓ
stop	b	d	g	g	k	ɓ
nasal	b	d	g	g	k	ɓ

But ɗ is invariable in stem alternation, but not in suffix alternation:

(46)

continuant	ɗ	j
stop	ɗ	ɗ
nasal	ɗ	ɗ

Except for this anomaly, we can postulate a single set of alternation rules that will account for the consonant alternation of both suffixes and stems.

4. Lexical specification in Fula

We have noticed that each given suffix always occurs with stems in a certain grade. For example, the suffixes ɓe and de always take stems in the continuant grade. The suffixes di and kon take stems in the nasalized grade. On the other hand, the suffixes ɗo, ɗe, ɗi, and gel always take stems in the stop grade. Let us say that suffixes such as ɗo, ɗe, ɗi, and gel are unmarked for an alternation rule; that is, they do not cause alternation in the stem. Suffixes like ɓe and de will be marked as [+AC] since only stems in the continuant grade can occur with these suffixes. This means that the alternation rule that changes stops to continuants will apply to a stem attached to such a suffix. Suffixes like di and kon will be marked as [+AN] since only stems in the nasalized grade can occur with these suffixes.

In addition, each given stem always occurs with suffixes in a certain grade. For example, stems like new 'palm (of the hand)' and ƭapā 'cliff' always take suffixes in the continuant grade. So these stems will be marked as [+AC]. Stems like ƭī 'forehead' and dar 'position' always take nasalized suffixes. Hence, these stems will be marked as [+AN]. Stems that take suffixes in the stop grade will be left unmarked

for an alternation rule. Thus we note that every morpheme, whether a suffix or a stem, may be marked as either [+AC] or [+AN]. It's also possible that a morpheme can be left unmarked. But more importantly, the rule marking does not mean that the rule will apply to the morpheme itself, but rather to the other morpheme that co-occurs with that morpheme. As an example, consider the morpheme birT 'peanut' which occurs with the suffix pair (gu,δi). Now birT is marked [+AC] and gu is marked [+AN], but δi is unmarked. Thus, we have the following derivations:

(47)	birT + gu	birT + δi
	[+AC] [+AN]	[+AC]
	b̰irTwu	birTji

The order of rule application is not important. birT can only co-occur with suffixes in the continuant grade and so gu is converted to wu and δi is converted to ji. And gu itself can only occur with stems in the nasalized grade and so birT is changed to b̰irT. But δi does not affect the underlying initial stop in the stem and so the underlying stem birT remains in the plural.

Of course, there are numerous stems with underlying stops that will not alternate even though they may occur with a suffix that is marked as occurring with an alternating stem. For example:

(48)	battā + du	batta + δi
	[+AC] [+AC]	[+AC]
	battāwu	battāji

Although the suffixes are altered, the stem is not, even though the suffix du requires a stem to be in the continuant grade. We do not get *wattawu. We noticed that there are a large number of stems, especially borrowed and re-analyzed words that the alternation rules never apply to. Stem alternation will therefore be considered exceptional and the natural case is for stems to be minus alternation (or [-A]). If a stem does alternate, then it must be marked so. Hence, battā is not only [+AC] (that is, it occurs only with suffixes in the continuant grade), but it is [-A]. Even though the suffix du is marked as [+AC], the fact that battā is [-A] means that consonant alternation will be blocked from

applying to battā. The stem birī will be marked as [+A]. In other words, the speaker must memorize that birī alternates. Hence, an alternation rule can apply to a stem only if the stem is marked as [+A]. If it is not, then the stem is never affected by alternation.

REFERENCES

Arnott, D. W. 1970. The Nominal and Verbal Systems of Fula. London: Oxford University Press.

Klingenheben, August. 1963. Die Sprache der Ful (Dialekt von Adamaua). Hamburg: Verlag J. J. Augustin.

Labouret, H. 1952. La langue des Peuls ou Foulbé. Mémoires de l'institut français d'Afrique noire 16:1.

Sapir, J. David. 1971. "West Atlantic: An inventory of the languages, their noun class systems and consonant alternation." Current Trends in Linguistics 7:45-112. The Hague: Mouton.

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A FOUR-TERM PERSON SYSTEM AND ITS RAMIFICATIONS

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1. Introduction

It is the aim of this paper to present a description of the person system of Ekpeye, and to display the various means of identifying unambiguously the dramatis personae in indirect speech.

Ekpeye is a member of what Williamson [1968] calls the Lower Niger group of languages, whose best known representative is Igbo. It is spoken in the neighbourhood of Ahoada in the Rivers State of Nigeria, and the material presented here was gathered during a period of field work in 1965-66.[1]

2. The pronominal prefixes

The verb structure of Ekpeye is highly complex, and only those aspects of it which are directly relevant to the present theme can be dealt with here.[2]

The normal way of specifying the category of person in Ekpeye verbs is by means of a set of pronominal prefixes. These prefixes constitute a four-term system, whose members may be glossed 'I', 'we (exclusive)', 'you', and 'he/she/it'. The items which manifest these persons are listed below. Three of the four terms have forms which vary with the tense of the verb, and in addition manifest vowel harmony or homorganic assimilation.

(1)

'I'	mV-/N̩-
'we (excl.)'	a-
'you'	I-/E-
'he/she/it'	U-/V-

Of the above upper case symbols, N̩ represents a syllabic nasal homorganic with the following consonant; I, E and U represent two-way

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[1]This work was assisted financially by a grant from the Central Research Fund of the University of London, and practically by various members of the Nigeria branch of the Summer Institute of Linguistics.

[2]For a full description, see Clark [1969].

vowel harmony systems on a basis of tongue height; and V represents a five-way vowel harmony system involving both tongue height and tongue position.[3] In the appendix of this paper (section 5):

(2) I is manifested by /i/ or /ị/
E is manifested by /e/ or /ɛ/
U is manifested by /u/ or /ụ/
V is manifested by /e/, /ɛ/, /a/, /ɔ/ or /o/
N̩ is manifested by /m/ or /n/

In their tense conditioning, the I- and U- forms occur with one set of tenses, and the E- and V- forms with another set. The tense distribution of mV- and N̩- is slightly different, but as the tense system is outside the scope of this article, no further details are given. The a- form is invariable in all tenses.

Thus far, traditional labels for the terms in the category of person have been carefully avoided. This is because such labels almost inevitably suggest misleading comparisons with European or other languages whose structure is quite different. Instead, the four terms of the Ekpeye system are labelled (in the same order as the forms given above) Speaker (S), Speaker's Group (SG), Hearer (H), and Referent (R). The category of number is relevant nowhere else in Ekpeye grammar, and its introduction here would complicate the description to no useful purpose.

3. The subject suffixes

The question now arises how Ekpeye handles those (notional) terms in the person system which are not covered by the forms shown in the previous paragraph. The answer lies in the co-occurrence potential of the pronominal prefixes with a certain order of suffixes.[4] Verbal suffixes, in addition to a functionally based division into classes and a phonologically

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[3]See Clark [1971b] for a full description of these and other systems.

[4]There are over sixty suffixes in Ekpeye, as described and discussed in Clark [forthcoming].

based division into tone groups, are on the basis of their co-occurrence potential, divided into orders. On these grounds, twenty-one orders are established. Within some of these orders, the members are semantically related to each other, and in order 17 in particular, the four members all have a semantic reference to the subject of the verb. For present purposes, the members of this order are referred to as subject suffixes. Their forms are as follows:

(3) -ɓɛ̀
-m̀
-mà
-nì[5]

-mà will be dealt with later, but the other three suffixes have a strictly controlled range of co-occurrence potential with the various pronominal prefixes. This is set out in (4) below, where filled cells indicate those combinations which may occur.

(4)

		-ɓɛ̀	-m̀	-nì
S	mV-/N-		x	
SG	a-			x
H	I-/E-			x
R	U-/V-	x		

The occurrence of -m̀ with the S term in the person system is obligatory in certain tenses, and does not cause any change in the semantic content. With -ɓɛ̀ and -nì, however, it is a different matter, and their occurrence with the R or H/SG terms does alter the semantic content. (See examples (9) through (22) which are set out paradigmatically in section 5.) The observed co-occurrences may be glossed as follows:

(5) a- + -nì 'we (inclusive)' (cf. examples 10 and 13)
I-/E- + -nì 'you people' (cf. examples 11 and 14)

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[5]In this paper, ´ is used to mark high tone, ` low tone, ˆ a high-to-low fall, and ˝ a high-to-mid fall. Mid, or down-stepped, is left unmarked.

U-/V- + -ɓɛ̀ 'they' (cf. examples 12 and 15)

Without the combination of a- with -nì, it would be a simple task to gloss -nì as pluralising the H term, and -ɓɛ̀ as pluralising the R term. They would thus be morphologically conditioned allomorphs of a plural morpheme. However, the a- + -nì combination, reinforced by the fact already stated that the category of number is not otherwise relevant in Ekpeye grammar, renders such an analysis untenable. It is for this reason that the pidgin English form 'you people' has been given as a gloss in preference to the standard form 'you (plural)'. (It is perhaps comparable with the 'you all' of some varieties of American English.)

Can -ɓɛ̀ and -nì, then, be allotted any coherent semantic domain? The most acceptable solution seems to lie in the concept of "group membership": thus -ɓɛ̀ can be said to mean that the group of which the Hearer is a member is the subject of the verb (whether or not the Speaker is a member of the same group). There is no need for further definition of the "groups" involved, since the language does not employ contrasts of gender, animate/inanimate or the like.

This description avoids introducing an awkward and otherwise superfluous category of number, and instead makes explicit a concept which, though not part of conventional grammatical terminology, is both socially and psychologically appropriate to West Africa.

It can now be seen that by its combinations of pronominal prefixes and subject suffixes, Ekpeye can readily express the full range of person distinctions familiar in European languages.

4. Indirect speech

One of the prominent characteristics of Ekpeye narrative is the very high proportion of indirect reported speech. Indeed, direct speech in narrative was recorded only from one informant, and he a man much more influenced by English than any of the others.

In Ekpeye, there are two particles which may introduce indirect speech, ménɪ́ and ɓṵ́, both of which are glossed as 'that'. The choice between them is determined by the person term in the verb introducing the indirect

speech; if it is S or SG, mɛ́nɪ́ occurs, and if it is H or R, ɓʊ́ occurs, as shown in (6).

(6)

Person ↓	Introductory Particle: mɛ́nɪ́	ɓʊ́
S	x	
SG	x	
H		x
R		x

The indirect speech following the introductory particle is either reflexive (examples (9) through (15)) or non-reflexive (examples (16) through (22)). Where it is non-reflexive, the position is relatively straightforward, as the full range of pronominal prefixes may occur with the verbs involved (examples (16) through (19)). The subject suffixes may also occur, co-occurring with the pronominal prefixes in the same combinations as outlined for direct speech in section 3 (examples (9c), (16c), (20) through (22)). The only limitation is semantic: some forms are very frequent, while others occur but rarely, or in artificial contexts. The possible combinations of introductory particle, pronominal prefix and subject suffix for non-reflexive indirect speech are summed up in (7).

(7)

Indirect Person ↓ \ Direct Person →	S	SG	H	R	
S		mV-/N̩-	mV-/N̩-	mV-/N̩-	-m̀
SG	a-		a-	a-	-nɪ̀
H	ɪ-/ɛ-	ɪ-/ɛ-		ɪ-/ɛ-	
R	ʊ-/ʌ-	ʊ-/ʌ-	ʊ-/ʌ-	ʊ-/ʌ	-ɓɛ̀
	mɛ́nɪ́		ɓʊ́		

In (7), blank cells represent reflexive forms. There is no blank at the intersection of the R row and column, since the resultant meaning

is not necessarily reflexive. For example, in 'He said that he would come', the second 'he' may be a fourth person. In Ekpeye, there would be no ambiguity here since a reflexive meaning would be expressed differently. Compare (19) with (12).

When the indirect speech is reflexive (examples (9) through (15)) there are more restrictions. Only the S and SG pronominal prefixes may occur (examples (9) and (10)), and only the -nì subject suffix of the three dealt with above (example (13)). The possible forms are set out in (8).

(8)

	Direct Person (No SFx.)	Indirect Person	Particle	Direct Person (With Sfx.)	Indirect Person
S	mV-/N̩-	mV-/N̩-	ménî		
SG	a-	a-	ménî	a- -nì	a- -nì
H	I-/E-	(yâ) (-mà)	bú	I-/E- -nì	a- (-nì)
R	U-/V-	(yâ) (-mà)	bú	U-/V- -bɛ̀	a- (-nì)

The most notable feature is that when the H or R person of the direct speech combines with a subject suffix, the SG person must occur in the direct speech (examples (14) and (15)). Where the H or R person of the direct speech is not combined with a subject suffix, no pronominal prefix may occur at all in the indirect speech. The emphatic reflexive pronoun yâ 'self, himself/herself/itself' occurs instead (examples (11) and (12)). When this happens, the subject suffix -mà (section 3) is obligatory with certain tenses (examples (11c), (12c)). In (8), -mà is bracketed because its distribution is limited in this way. yâ is bracketed because it is not a person prefix, and the -nì forms in the right hand column are bracketed because they are not obligatory, but rather depend on the sense of the non-linguistic context.

Ekpeye is thus seen to have a definite and unambiguous system of representing any participant in a narrative in both direct and indirect speech. Difficulties in analysis and/or speaking mastery arise not so much from the multiplicity and complexity of the forms themselves as from

the fact that potential ambiguities of reference are resolved less by the occurrence of any given form than by the co-occurrences of person prefixes, subject suffixes and introductory particles. Such difficulties will always arise where any two languages employ items from different categories in their respective grammars to express the same semantic domain.

5. Appendix

As it is not possible to exemplify all the forms cited above from unelicited material, the following examples are given in paradigm form. In these examples, all prefixes and suffixes are marked off by hyphens, and the monosyllabic verb root ze - go is used throughout. The suffix -lɛ̂ is tense-conditioned in its occurrence.

Examples (9) through (15) are reflexive:

(9)	a.	má-kà ménǐ mè-zé	'I said that I would go'
	b.	má-kà ménǐ mé-zè	'I said that I went'
	c.	má-kà ménǐ mé-ze-lɛ̂-m̀	'I said that I had gone'
(10)	a.	à-kà ménǐ à-zé	'We (excl.) said that we would go'
	b.	à-kà ménǐ à-zè	'We (excl.) said that we went'
	c.	à-kà ménǐ à-zé-lɛ̂	'We (excl.) said that we had gone'
(11)	a.	ɨ́-kà ɓú yá zé	'You said that you would go'
	b.	ɨ́-kà ɓú yá zè	'You said that you went'
	c.	ɨ́-kà ɓú yá zé-lɛ̂-mà	'You said that you had gone'
(12)	a.	ù̱-kà ɓú yá zé	'He said that he (himself) would go'
	b.	ù̱-kà ɓú yá zè	'He said that he (himself) went'
	c.	ù̱-kà ɓú yá zé-lɛ̂-mà	'He said that he (himself) had gone'
(13)	a.	à-kà-nɨ́ ménǐ à-zé-nì	'We (incl.) said that we would go'
	b.	à-kà-nɨ́ ménǐ à-zè-nì	'We (incl.) said that we went'
	c.	à-kà-nɨ́ ménǐ à-zé-lɛ̂-nɨ́	'We (incl.) said that we had gone'
(14)	a.	ɨ́-kà-nɨ́ ɓú̱ à-zé	'You people said that you would go'
	b.	ɨ́-kà-nɨ́ ɓú à-zè	'You people said that you went'
	c.	ɨ́-kà-nɨ́ ɓú à-zé-lɛ̂	'You people said that you had gone'

(15) a. ù-kà-ɓɛ̀ ɓú à-zé 'They said that they would go'
b. ù-kà-ɓɛ̀ ɓú à-zè 'They said that they went'
c. ù-kà-ɓɛ̀ ɓú à-zé-lɛ̂ 'They said that they had gone'

Examples (16) through (22) are non-reflexive:

(16) a. ù-kà ɓú mè-zé 'He said that I would go'
b. ù-kà ɓú mé-zè 'He said that I went'
c. ù-kà ɓú mé-ze-lɛ̂-m̀ 'He said that I had gone'

(17) a. ù-kà ɓú à-zé 'He said that we (excl.) would go'
b. ù-kà ɓú à-zè 'He said that we (excl.) went'
c. ù-kà ɓú à-zé-lɛ̂ 'He said that we (excl.) had gone'

(18) a. ù-kà ɓú è-zé 'He said that you would go'
b. ù-kà ɓú ɨ-zè 'He said that you went'
c. ù-kà ɓú é-ze-lɛ̂ 'He said that you had gone'

(19) a. ù-kà ɓú è-zé 'He said that he (another) would go'
b. ù-kà ɓú ù-zè 'He said that he (another) went'
c. ù-kà ɓú è-zé-lɛ̂ 'He said that he (another) had gone'

(20) a. ù-kà ɓú à-zé-nì 'He said that we (incl.) would go'
b. ù-kà ɓú à-zè-nì 'He said that we (incl.) went'
c. ù-kà ɓú à-zé-lɛ̂-nì 'He said that we (incl.) had gone'

(21) a. ù-kà ɓú è-zé-nì 'He said that you people would go'
b. ù-kà ɓú ɨ-zè-nì 'He said that you people went'
c. ù-kà ɓú é-ze-lɛ̂-nì 'He said that you people had gone'

(22) a. ù-kà ɓú è-zé-ɓɛ̀ 'He said that they would go'
b. ù-kà ɓú ù-zè-ɓɛ̀ 'He said that they went'
c. ù-kà ɓú è-zé-lɛ̂-ɓɛ̀ 'He said that they had gone'

As other non-reflexive forms can easily be derived by permutation from the above examples, they are not given separately.

REFERENCES

Clark, D. J. 1969. "A grammatical study of Ekpeye." University of London doctoral dissertation. Unpublished.

Clark, D. J. 1971a. "Three 'Kwa' languages of Eastern Nigeria." Journal of West African Languages 8.1:27-36.

Clark, D. J. 1971b. "Vowel harmony systems in Ekpeye." Research Notes 4.1:23-33. Ibadan: University of Ibadan.

Clark, D. J. Forthcoming. "The classification of verbal suffixes in Ekpeye."

Williamson, K. 1968. "Languages of the Niger Delta." Nigeria Magazine 97:124-130.

Williamson, K. Forthcoming. "The Lower Niger language group."

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ON RECONSTRUCTING THE MODIFIED BASE OF BANTU VERBS[1]

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1. Introduction

In many Bantu languages one finds a verb suffix, or modified form of the verb stem, often called the Modified Base. Its function varies somewhat from language to language, but it probably denoted the perfective or terminative aspect in Proto-Bantu. In Chibemba, for example, it is used in many past time divisions, denoting the aspectual feature [terminated] (see Givón [1970b, part IV]). In the languages of the interlacustrine region of East-Central Africa it is used mainly in the perfect and near past tenses. It has been demonstrated [Givón 1970a] that apparent irregularities in the modified bases of Chibemba verbs may be resolved when deeper, underlying forms of the verb stems are used and several phonological rules are applied in explicit order.

In this paper I show that in each of four languages the Proto-Bantu form of the modified base can be reconstructed largely on internal grounds--once the deeper, underlying verb forms and an explicit order of the rules of phonology (synchronic or diachronic) are posited. I shall begin with a brief recapitulation of Givón's [1970a] analysis for Chibemba and then proceed with my own analysis of three other, fairly closely related languages of the interlacustrine region: Runyankore, Kirundi and Luganda.[2] Of course the distinction between historical and synchronic description must be borne in mind. Givón's rules for Chibemba are intended as synchronic, but I am making no claims here for synchrony in all the rules for the other three languages.

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[1]I am grateful to T. Givón and A. E. Meussen for their comments and criticisms of an earlier draft of this paper. Conclusions, errors, etc. are my own. I am also grateful to A. Takizala for the Kihuŋan data.

[2]It should be noted that for the sake of clarity and consistency /l/ has been used throughout the data, since Luganda has [r] only allophonically, and Kurundi and Runyankore have only /r/.

2. The modified base in Chibemba

Givón [1970a] has observed two ways of forming the modified base, one for monosyllabic, the other for polysyllabic verb stems. For the purposes of this paper, I shall call them MB1 and MB2, respectively. MB1 involves the suffixation of the morpheme -Vle[3] to the verb stem. The unspecified vowel is [+front], its height determined by rules of vowel harmony common to most verb suffixes, and illustrated as follows:

(1) $[CV(C)]_{stem} \rightarrow [CV(C) + Vle]_{MB1}$

(2) $V \rightarrow \left\{\begin{matrix} i \;/\; (i,u,a,) \\ e \;/\; (e,o,\;\;) \end{matrix}\right\} (C)\_\_\_\_$

Also, [l] becomes [n] if the final consonant of the stem is a nasal. Observe the following verbs and their MB's:

(3)

	stem		MB
a)	-limb-	'plant'	-limbile
b)	-lemb-	'write'	-lembele
c)	-fum-	'come from'	-fumine
d)	-pon-	'fall'	-ponene

Using 'deeper' underlying forms and ordering rules of vowel harmony and gliding, apparent irregularities are seen as not irregular at all:

(4) glide rule: $\begin{bmatrix} +voc \\ +high \end{bmatrix} \rightarrow [-voc] \;/\; \_\_\_\begin{bmatrix} +voc \\ -high \end{bmatrix}$

(5) length rule: $\emptyset \rightarrow \begin{bmatrix} +voc \\ \alpha F \end{bmatrix} \;/\; \begin{bmatrix} -cons \\ -voc \end{bmatrix} \_\_\_ \begin{bmatrix} +voc \\ \alpha F \end{bmatrix}$

((4) and (5) are coupled; vowel lenthening does not take place after glides which originated from a consonant.)

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[3]It is not really necessary to use -Vle. Since V is [-low, -back], it is simpler, and historically correct, to have -ile with a harmony rule (generalized to include other suffixes including those with u-):

$V \rightarrow [-high] \;/\; \begin{bmatrix} -high \\ -low \end{bmatrix} (C)[\_\_\_\_]_{suffix}$

(6)

	surface form		underlying form	vowel harmony	gliding and vowel length
a)	-shy-	'leave'	-shi-	-shi-ile	-shiile
b)	-sw-	'pluck'	-su-	-su-ile	-swiile
c)	-nw-	'drink'	-no-	-no-ene	-nweene
d)	-b-	'be'	-be-[4]	-be-ele	-beele
e)	-p-	'give'	-pe-[4]	-pe-ele	-peele

Polysyllabic stems, on the other hand, use MB2, which consists of preposing the incompletely specified vowel before the stem-final consonant and suffixing -e.

(7) $[\underset{\text{stem}}{\_\_C}] \dashrightarrow [\_\_VC + e]_{MB2}$[5]

which, with the correct rule order gives us:

(8)

	stem		vowel harmony	gliding and vowel length
a)	-looleshi-	'gaze'	-loole-eshi-e	-looleeshye
b)	-kutuluk-	'remember'	-kutulu-ik-e	-kutulwiike
c)	-onon-	'remove from trap'	-ono-en-e	-onweene

Again, by positing 'deeper' underlying forms, underlying regularity is revealed. Two other rules, vowel fusion and vowel shortening (reducing three-vowel sequences to two), also need to be considered, ordered after the harmony and gliding rules:

(9)

	surface form		underlying form	harmony, gliding vowel length	fusion and shortening
a)	-shyaal-	'remain'	-shial-	-shyaa-ile	-shyeele
b)	-ƚwaal-	'escort'	-ƚual-	-ƚwaa-ile	-ƚweele
c)	-ikaƚ-	'seize'	-ikaƚ-	-ika-iƚ-e	-ikeeƚe

Givón [1971] has noted that normal palatalization of [k] (--> [c]) before [i] does not occur before the [i] of verb suffixes, including the

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[4]Givón [1970a] originally chose -be-, -pe- as "least burdened". It seems, though, that considerations of markedness, borne out by comparative evidence, require -ba- and -pa- as the underlying forms.

[5]See footnote 3.

MB. This suggests the diachronic presence of a boundary, possibly caused by a historical rule deleting a consonant. This suggestion is important in light of the data from the other languages, see below, where it will appear necessary to posit such a consonant.

3. The modified base in Runyankore

In Runyankore both MB1 and MB2 are found, but under different conditions. MB2 is used only with polysyllabic verbs whose stems end in the voiced dental continuants [l,z], the dental nasal [n] and the [-ibw-] form of the passive. Elsewhere the MB1 is used. There is no vowel harmony or nasal harmony.

(10)		surface form		underlying form	MB1
	a)	-gamb-	'say'	----	-gambile
	b)	-taah-	'go home'	----	-taahile
	c)	-shutam-	'squat'	----	-shutamile
	d)	-gw-	'fall'	-gu-	-gwiile
	e)	-ly-	'eat'	-li-	-liile
	f)	-b-	'be'	-ba-	-baile
	g)	-h-	'give'	-ha-	-haile
	h)	-f-	'die'	-fu-	-f^{w}iile

(11)		surface form		underlying form	MB2
	a)	-twaal-	'take'	-tual-	-twaile
	b)	-teel-	'hit'	----	-teile
	c)	-tyootyooz-	'interrogate'	-tiotioz-	-tyootyoize
	d)	-shemezibw-	'be pleased'	----	-shemeziibwe
	e)	-eshongol-	'sing'	----	-eshongoile

Note that, although gliding takes place (10d,h; 12d), vowel-fusion does not (10f,g; 11a-c,e). Also, there is vowel shortening (11a-c). Though my data are rather limited for this language, it seems that most cases of non-fusion occur when it is rather clear that a consonant has been lost:

(12) oine - 'you have' (cf. Luganda: olina)
aine - 'he has' (cf. Luganda: alina)
eine - 'it (cl. 9) has' (cf. Luganda: elina)
but: twiine - 'we have' (cf. Luganda: tulina)

It seems, then, that, like Chibemba, Runyankore shows evidence of a consonant being sometimes realized as a boundary. The fact that gliding takes place but not fusion indicates that relatively recently the boundary began to be lost, beginning with the gliding environment. The fact that in the modern, spoken language the sequence ai is often pronounced as ee (e.g. the town Rwashamaire, or verb forms like -twaile, etc. are often pronounced [rwashameere], [-tweere], etc.) supports this contention.

As for vowel shortening, it always occurs at a word-final boundary in Bantu languages:

(13) a) -li-a --> -lyaa --> -lya
b) -ba-a --> -baa --> -ba
c) -fu-a --> -f^{w}aa --> -f^{w}a

The examples of shortening in (11a-c) could be part of a general constraint in Bantu against having three-vowel sequences, or it could be, as Meussen [personal communication] has suggested, an attempt to limit the number of moras in a given word, in this case to an increase of one instead of two. It now appears that the presence of a boundary is a third, and equally valid possibility as an explanation (see also discussion of this in Givón [1970a]).

Observe now the following:

(14)

	stem		MB
a)	-end-	'go'	-enzile
b)	-kol-	'do'	-kozile
c)	-ij-	'come'	-izile
d)	-it-	'kill'	-itsile

There is ample evidence throughout the Bantu family that such consonant changes as:

(15) / d,l,j / --> [z]
/t/ --> [ʦ] or [s][6]

were caused by a super-closed, high, front vowel [ɟ] (see Meinhoff [1932]) which often affected labial and velar consonants as well. It seems that in Runyankore [ɟ] became [i] before the change was generalized to the other, non-central consonants. We may say, then, that the pre-Runyankore forms of the modified base were:

(16) a) MB1: -Ø ɟ le
b) MB2: [... Ø ɟ-C-e] (where Ø = boundary caused by deletion of a consonant)

Let us now turn to two other languages where the MB appears to be, on the surface, completely irregular and chaotic.

4. The modified base in Kirundi

In Kirundi the MB appears to be -ye (synchronically we probably ought to say that it is), accompanied by a wide variety of consonant changes which strongly indicate that the vowel of the MB was originally the super-closed [ɟ] of Proto-Bantu. Note how the consonants are drawn towards the central (dental or palatal) region, and also opened (or closed) to become spirants.

(17) $\left\{\begin{matrix} d,g,l \\ z \\ k \\ c,h \end{matrix}\right\} \text{--> } \left\{\begin{matrix} z \\ ž \\ ʦ \\ š \end{matrix}\right\} \text{ / \_\_ ɟ}$

(18)

	stem		MB
a)	-bon-	'see'	-booñe[7]
b)	-som-	'read'	-somye
c)	-gend-	'go'	-genze

---

[6] t --> ʦ in Runyankore; t --> s in its sister dialect, Rukiga.

[7] The lengthened vowel, seemingly inexplicable, may, as Givón suggests, arise from MB2 (cf. -mona in Chibemba, through -mweene <-- -mo-ene). But this would not account for the palatalization of the nasal. Taking a cue from Meussen's suggestion on vowel shortening, I would suggest that lengthening here may be compensation for a lost mora arising from the change ny --> ñ.

	stem		MB
d)	-laab-	'look'	-laavye
e)	-tweng-	'laugh'	-twenze
f)	-andik-	'write'	-anditse
g)	-kol-	'do'	-koze
h)	-baaz-	'saw'	-baaže
i)	-ic-	'kill'	-iše
j)	-šuuh-	'be warm'	-šuuše

Evidently /l/ was lost in the MB, as it often has been in Bantu languages when intervocalic and in an ultimate syllable (e.g. Swahili), thus allowing the [j] to glide. It is also common in Bantu for the palatal glide to be "swallowed" by (i.e. deleted after) the central spirants [s,š,z,ž,(and [t])], while [l,n] become palatalized, as in, e.g.:

(19) {zi, si, ši, ži, li, ni, ti} --> {za, sa, ša, ža, λa, ña, ta} but not: * {zya, sya, šya, žya, lya, nya, tya}

Thus note the presence of the glide only after [m,v].

A look at the CV stems introduces some difficulty. Thus note the lengthened vowels:

(20)	surface form		underlying form	MB2
a)	-b-	'be'	-ba-	-baaye
b)	-ñw-	'drink'	-ño- (or -nio-)	-ñooye
c)	-ly-	'eat'	-li-	-liiye
d)	-pf-	'die'	-pfu-	-pfuuye

On the basis of previous discussion we should posit intermediate forms:

(21) a) -ba-j̩le
b) -ño-j̩le
c) -li-j̩le
d) -pfu-j̩le

There seem to be three possible explanations. The first is that [l] was lost and then [j̩] glided. This leaves unexplained, however, the fact that, prior to the rule of l-loss, there was no vowel fusion or gliding (Kirundi has both) to give forms like:

(22) a) *-beele or *-beeye
b) *-pfwiile or *-pfwiiye

A second explanation is that [l] became [y] while a regressive assimilation rule took place, thus:

(23) -ba-ile --> baale --> baaye

But the normal assimilation rules in Kirundi are progressive and would yield *-biiye.

I would like to suggest that a consonant or boundary prevented such gliding and fusion (as in Runyankore) and that the sequence of events must have been:

(24)	+MBl	l-loss, gliding and shortening	boundary loss
a)	-baℓj̩le	-baℓye	*-baye
b)	-ñoℓj̩le (-nio-)	-ñoℓye (-ñooℓye)	*-ñoye (-ñooye)
c)	-liℓj̩le	-liℓye	*-liye
d)	-pfuℓj̩le	-pfuℓye	*-pfuye

The problem now is how to account for the long vowels. It might be suggested that the boundary loss caused the stem vowels to lengthen, but that seems never to have occurred elsewhere in Kirundi. The only explanation that appears plausible is to posit a lengthening rule (in CV verbs, at least) in compensation for the lost mora (cf. footnote 7) resulting from the l-loss and gliding rules.

A similar problem is seen in polysyllabic stems ending in /l/, where /l/ apparently inexplicably changes to [y]:

(25)

	stem		MB
a)	-ugal-	'close'	-ugaye
b)	-ugulul-	'open'	-uguluye
c)	-subil-	'go back'	-subiye
d)	-sibilil-	'repeat'	-subiliye

We know that /l/ becomes [z] before the super-closed /ɟ/. But using examples (24) as a clue we see that in reality the forms in (25) are the result of MB2. The following derivations are then posited:

(26)

	stem	+MB2	l-loss gliding	∅-loss
a)	-ugal-	-uga-∅ɟle	-ugaɟ∅ye	-ugaye
b)	-ugulul-	-ugulu-∅ɟle	-uguluɟ∅ye	-uguluye
c)	-subil-	-subi-∅ɟle	-subiɟ∅ye	-subiye
d)	-subilil-	-subili-∅ɟle	-subiliɟ∅ye	-subiliye

Here too, we need the boundary in column 2 to prevent gliding and fusion before l-loss which would give us incorrect forms, such as:

(27) a) *-ugeele or *-ugeeye

b) *-ugulwiile or *-ugulwiiye

Note there is no vowel lengthening after ∅-loss. This indicates that we must indeed restrict our rule for vowel length to the CV verbs 'short stems'. At any rate, it is clear that l-loss in (25) is simply a generalization on the rule of l-loss in MB1.

5. The modified base in Luganda.

We turn now to Luganda where the data are similar to those of Kirundi, yet a bit more complicated. Note that the geminate consonants are affected in the same way as the single ones:[8]

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[8]There are in Luganda two verbs that remain irregular:

-kwaata --- -kutte 'catch'; -ŧwaala --- -ŧutte 'carry'

My guess is that they are relics from a time when -ata and -ala were productive suffixes. But -ŧwala cannot have come from a no-longer existent *-ŧu-, for our rules would incorrectly derive *-ŧudde. Positing for -kwaata -ku- would give us the wrong *-kudde. At any rate, I am

(28)

	stem		MB		stem		MB
a)	-som-	'read'	-somye	h)	-yig-	'learn'	-yize
b)	-gaan-	'refuse'	-gaañe	i)	-yigg-	'hunt'	-yizze
c)	-loop-	'accuse'	-loopye	j)	-ṭuuk-	'arrive'	-ṭuuse
d)	-lab-	'see'	-labye	k)	-bikk-	'come down'	-bisse
e)	-bb-	'steal'	-bbye	l)	-leeṭ-	'bring'	-leese
f)	-kul-	'grow'	-kuze	m)	-ṭṭ-	'kill'	-sse
g)	-gend-	'go'	-genze	n)	-jj-	'come'	-zze

The rules of consonant changes before /j̨/ in Luganda are, informally:

(29) $\left\{\begin{array}{ll} /l,d,j,g/ & \rightarrow z \\ /ṭ,k/ & \rightarrow s \end{array}\right\} /\_\_j̨$

There are a few verbs whose stems end in [w]. Evidently the [w] (possibly from a consonantal source to begin with, possibly inserted intervocalically) acts like a consonant, except that it gets deleted after the gliding of [j̨]:

(30) a) -koow- 'tire' --> -kooye
b) -fuuw- 'blow' --> -fuuye

Consider now the CV ('short stem') verbs, whose MB, though different from those of Kirundi, seem just as strange:

(31)

	surface form		underlying form	MB
a)	-b-	'be'	-ba-	-badde
b)	-s-	'grind'	-se-	-sedde
c)	-w-	'give'	-wa-	-wadde
d)	-ly-	'eat'	-li-	-lidde
e)	-ky-	'clear up'	-ke-	-kedde
f)	-ñw-	'drink'	-ño-	-ñwedde[9]

---

happy to report that two dialects of Luganda, Lunnamasaka and Lunnabuddu, have evidently re-analyzed these two verbs using MB forms -kwase and -ṭwadde, respectively, which are perfectly regular.

[9]Evidently -ñwedde is from -ñweel- (by MB2, see below) which is the 'applied' verb form (with the suffix -el-). Otherwise we should expect the unattested *-ñodde, which may or may not have existed in the past.

It is known that [dd] in Luganda has two sources. In class 5 nouns the class prefix is C-, completely identical to the following consonant, if there is one; or it is li- when the stem is either monosyllabic or vowel commencing (it was *li- or *lị- in Proto-Bantu):

(32) a) eli-ñña 'name'
b) eli-envu 'banana'
but: c) ef-fumbe (from *elị-fumbe) pl. ama-fumbe 'civet'
d) eddungi (from *elị-lungi) pl. ama-lungi 'good'

The other case appears in verbs whose stems begin with a -CC... geminate consonant when the preceding prefix is of the form (C)V. In these verbs, the sequence -zi pops out and replaces the first consonant when the subject prefix N- (1st sg.) precedes:

(33) a) -tta 'kill'[10]
b) otta 'you kill'
c) nzita 'I kill'
d) -ddugala 'become black'
e) oddugala 'you become black'
f) nzilugala 'I become black'

There is no other clearly reconstructible source for [dd]. Therefore we must conclude that [-dde] in the MB arose from -Cị le, and since [z] is shown in (33) above and we know that [z] before /ị/ came from either /l/ or /g/ (Proto-Bantu */ɣ/), we conclude that [C] was one of those two consonants (probably /ɣ/, since it was a more stable segment, especially in Luganda where it often still exists on the surface as [g][11]).

Like Kirundi, Luganda has a MB form for polysyllabic stems ending in /l/ similar to that of CV stems, and paralleling Runyankore in the MB of passives in [-ibw-]:

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[10]Compare -tta, -jja, -bba, with other languages, like Runyankore, -ita, -ija, -iba.

[11]Givón [1971] cites Polomé [in private communication] to the effect that in Kichagga, spoken in Tanzania, the surface form of the MB is -gil-e.

(34)

	stem		MB
a)	-yagal-	'love, want'	-yagadde
b)	-gendelel-	'intend'	-gendeledde
c)	-labibw-	'be seen'	-labibbwa
d)	-sibibw-	'be tied'	-sibibbwa

(Note that the MB of the passive has the neutral suffix vowel -a instead of -e. I defer discussion of this to the section on causatives.)

With what we know of Kirundi and the Luganda CV stems, it is reasonably clear that in these two environments Luganda, too, has the MB2, and so intermediate forms of (34) are those of (35):

(35) a) -yaga-ɣi̯l-e
b) -gendele-ɣi̯l-e
c) -labi-ɣi̯bw-a
d) -sibi-ɣi̯bw-a

6. Brief recapitulation

We conclude, then, that the Proto-Bantu form of the MB was /*-ɣi̯l-e/, and we may sum up for each language in turn what must be or have been the correct orders of rules. We may assume that Chibemba originally had both /ɣ/ and /i̯/ in the MB morpheme, and that the loss and laxing, respectively, preceded the relevant rules which are ordered and illustrated as follows:

(36) a) vowel harmony
b) nasal assimilation
c) gliding and compensatory vowel lengthening
d) vowel fusion
e) vowel shortening

Applied to the various stem types, the rules yield:

(37)	stem:	-lemb-	-no-	-ba-	-onon-	-shial-
	+MB:	lemb-ile	no-ile	ba-ile	ono-in-e	shia-il-e
	a)	lembele	noele	---	onoene	---
	b)	---	noene	---	---	---
	c)	---	nweene	---	onweene	shyaaile
	d)	---	---	beele	---	shyeeele
	e)	---	---	---	---	shyeele

For Runyankore we need the following order of rules:

(38) a) $\gamma \rightarrow \begin{Bmatrix} \emptyset & /C\_\_\_ \\ \text{¢} & /V\_\_\_ \end{Bmatrix}$

b) spirantization of dentals before /j/

c) laxing of /j/

d) loss of boundary (in gliding environment)

e) gliding and compensatory lengthening

f) vowel fusion due to generalized boundary loss (just beginning to take place)

Applied to the different stem types the rules yield:

(39)	stem:	-gamb-	-ba-	-it-	-gu-	-teelan-
	+MB:	gamb-γile	ba-γile	it-γile	gu-γile	teela-γin-e
	a)	gambile	ba¢ile	itile	gu¢ile	teela¢ine
	b)	---	---	itsile	---	---
	c)	gambile	ba¢ile	itsile	gu¢ile	teela¢ine
	d)	---	---	---	guile	---
	e)	---	---	---	gwiile	---
	(f)	---	(beele)	---	---	(teeleene)

In Kirundi the rules are ordered as follows:

(40) a) $\gamma \rightarrow \begin{Bmatrix} \emptyset & /C\_\_\_ \\ \text{¢} & /V\_\_\_ \end{Bmatrix}$

b) centralization and spirantization

c) l-loss

d) laxing of /j/

e) gliding and compensatory lengthening

f) vowel shortening

g) boundary loss

h) vowel lengthening in CV stems

i) glide absorption (after central spirants)

When applied to the various stem types, the rules yield:

(41)	stem:	-som-	-gend-	-pfu-	-subil
	+MB:	som-ɣi̯le	gend-ɣi̯le	pfu-ɣi̯le	subi-ɣi̯l-e
	a)	som-i̯le	gend-i̯le	pfu-ℓi̯le	subi-ℓi̯le
	b)	---	genzi̯le	---	---
	c)	somi̯e	genzi̯e	pfuℓi̯e	subiℓi̯e
	d)	somie	genzie	pfuℓie	subiℓie
	e)	somyee	genzyee	pfuℓyee	subiℓyee
	f)	somye	genzye	pfuℓye	subiℓye
	g)	---	---	pfuye	subiye
	h)	---	---	pfuuye	---
	i)	---	genze	---	---

Finally, in Luganda the rules are ordered:

(42) a) ɣ --> ∅ /C___

b) centralization and spirantization

c) gemination

d) l-loss

e) laxing of /i̯/

f) gliding and lengthening

g) vowel shortening

h) w-loss

i) glide absorption

and they yield, when applied to the different stem types:

(43)	stem:	-yit-	-lab-	-fu-	-yagal-	-koow-
	+MB:	yit-ɣi̯le	lab-ɣi̯le	fu-ɣi̯le	yaga-ɣi̯l-e	koow-ɣi̯le
	a)	yit-i̯le	lab-i̯le	---	---	koow-i̯le
	b)	yisi̯le	---	fuzi̯le	yagazi̯le	---
	c)	---	---	fudde	yagadde	---
	d)	yisi̯e	labi̯e	---	---	koowi̯e

e)	yisie	labie	---	---	koowie
f)	yisyee	labyee	---	---	koowyee
g)	yisye	labye	---	---	koowye
h)	---	---	---	---	kooye
i)	yise	---	---	---	---

7. Some problems with the causative

Givón [1970a] makes no mention of the causative as posing any problem for the MB in Chibemba. But in the other three languages problems arise, so some remarks about them are in order. Observe the following in Runyankore monosyllabic stems:

(44)

	stem		MB
a)	-kol-	'do'	-kozile
b)	-gul-	'close'	-guzile

Their causatives are:

(45)

	stem		MB
a)	-koz-	'make do'	-kolize
b)	-guz-	'make close'	-gulize

At first glance, comparing the MB's in (44) and (45), we appear to have a kind of metathesis. But it should be pointed out that the causative suffix is -i- (*-į- in PB) which, like its counterpart in the MB changes /l/ to [z] (among other consonant changes). It is now clear that to form the MB of causatives we must order the sequences of suffixes so that the causative is attached to the MB and not vice-versa:

(46) a) kol-il-į-e --- kolizye --- kolize
b) gul-il-į-e --- gulizye --- gulize

Note that at the point in history when (46) took place the vowel of the MB must have already been lowered to /i/ but that of the causative had not yet undergone the same change; otherwise we should get the unattested forms:

(47) a) *kozize
b) *guzize

In Kirundi the problem is quite similar when the stem vowel is short (with long vowels the palatalization of /z/ to [ž] is regular):

(48)

	causative		MB
a)	-baaz-	'saw'	-baaže
b)	-vuz-	'play music'	-vugiže (cf. vug- --> vuz-)
c)	-oz-	'wash'	-ogeže (cf. og- --> oz-)
d)	-baz-	'ask'	-baživže (cf. baj- --> baz-)

In addition to the parallel with Runyankore, a few other phenomena in Kirundi may be noted. (48c) shows that after lowering of the super-closed vowel of the MB, vowel harmony applies. Next, it seems that palatalization has applied a second time, though only in the MB-cum-causative environment:

(49) vug-i-l-į-e --> vugizį-e --> vugizye --> vugiže

Finally we observe the regressive assimilation in (48d) similar to that in (50):

(50) -saaz- --> -šaaže 'grow old'

Luganda presents a much more complicated picture:

(51)

	stem		causative	MB of causative
a)	-yingil-	'enter'	-yingiz-	-yingizizz-a
b)	-bal-	'count'	-baz-	-bazizz-a
c)	-lim-	'farm'	-limį-	-limizz-a
d)	-limik-	'be arable'	-limis(i)-	-limisizz-a

The geminate clusters can be readily explained by ordering the causative after the MB, as in the other two languages. But this will give us the incorrect forms in (52):

(52) a) -yingil-į-l-į --> -yingiz-įz-į --> *-yingizz-

b) -bal-į-l-į- --> -bazįz-į --> *-bazz-

c) -lim-į-l-į --> -lim-įz-į --> *-limiz-

d) -limik-į-l-į --> -limis-įz-į --> *-limisiz- or *-limizz-

The only explanation seems to be that, whereas in Runyankore and Kirundi the causative suffix is after the MB, in Luganda the causative is added

both to the stem and to the MB. In other words instead of being shifted around to the right the causative must be copied on the right, with deletion of the first in Runyankore and Kirundi but not in Luganda:[12]

(53) a) -bal-i-ɣɨl-ɨ- --> -baz-izz-i --> -bazizz-
b) -limik-ɨ-ɣɨl-ɨ- --> -limis-izz-i --> -limisizz-

It is most interesting to note that (52a,b) are precisely what one hears in informal, contemporary Luganda, in addition to (51a,b). Moreover, in a verb like -yigiriza 'teach (make learn)' one obtains:

(54) -yigirizza but not *-yigirizizza

as one would expect. The starred form in (54) is unacceptable. "It's too long" is the native speaker's explanation. Evidently, speakers have re-analyzed forms such as (54) and deleted the first causative suffix. They are in the process of extending that deletion to forms like (51a,b) to produce those like (52a,b), and one may predict that it will eventually be extended to forms such as (52c,d).

As for the occurrence of the neutral suffix -a in place of -e in the MB forms -ibbwa and -izza, the only reason I can see at the moment is that there must be some constraint against -e following a geminate cluster which results from the combination of the MB and another suffix. This explanation admittedly sounds ad hoc and requires further study.

8. Conclusion

We have seen in the foregoing discussion that it was possible to find regularities in the formation of the modified base of several types of verb stems in four different languages. We have also seen that, through largely internal reconstruction, it was necessary to posit very similar underlying forms and phonological rules (many of them still productive) in much the same order and with relatively few language-specific (mainly historical) rules. One final question remains; why are there two ways to form the MB in each language, depending on the verb stem? Or in other words, what is the origin of MB2?

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[12] I am grateful to T. Givón for this suggestion. Notice, moreover, how this relates to Givón's [1971] contention that Bantu verb suffixes arose originally from separate verbs.

Recall that in Chibemba MB2 is used with polysyllabic stems generally, but in Runyankore it is used only with those polysyllabic stems ending in /l,z,n/ and the [-ibw-] form of the passive; in Kirundi it is used only with those ending in /l/; in Luganda it is used only with those ending in /l/ and the [-ibw-] passive suffix. We must assume that the development of MB2 originated in Proto-Bantu with those polysyllabic stems ending in /l/, first because /l/ is the one segment common to all four languages, and second because with MB1 there would have been a sequence -il-jl-, one quite likely to be reduced or modified in some way.

Once this change took place it was possible for individual languages later to generalize it to include additional environments. It cannot be mere coincidence that (a) simple PB verb stems are mainly monosyllabic (CVC), (b) polysyllabic stems are mostly CVC stems with derivational suffixes, and (c) in the VC suffixes the consonants are often /l/, /z/ (itself derived from [l + j]), /n/. /b/ intervocalically is phonetically [β], a continuant, like the others. Chibemba, then, extended the change to all the other consonants, including stops like /t,k/. Kirundi did not extend it at all, and the other two languages extended the change to a greater or lesser degree.

Finally, it is worth mentioning, since it illustrates a possible first stage in the development of MB2, that in Kihuŋan, a language of Southwestern Zaire, verbs whose stem vowel is /u/ form the MB by <u>copying</u> the /i/ of the MB (-ir) in front of the stem final consonant, as illustrated below (note that there is nasal harmony but no vowel harmony):

(55) a) -buk- --> -bu-i-k-ir --> -bwikir 'cure'
b) -fut- --> -fu-i-t-ir --> -f^{w}itir 'pay'
c) -tuun- --> -tuu-i-ŋ-in --> -twiiŋin 'build'

as against:

(55) d) -kot- --> -kotir 'enter'
e) -tek- --> -tekir 'sell'
f) -bik- --> -bikir 'sing'

I do not pretend to know much about Kihunjan, and my data are very limited. Furthermore, the copying environment in (55a-c) is quite different from the environments of MB2 in the other languages. But the point I wish to make is that it may well have been the case that MB2 in Proto-Bantu began as a copying of /j/ (or rather, /ɣj/) across the final stem consonant, followed in most languages by deletion of the original /(ɣ)j/. Recall the copying in section 7, where Luganda did not have accompanying deletion of the first occurrence of the causative suffix. Leaving aside the question of the motivation for the copying in Kihunjan, we have now reason to suppose that what appears to have been a movement rule was really a copying rule followed by deletion. These add to the growing body of evidence that there may be, in fact, no movement rules in grammars, only copying and deletion rules.

REFERENCES

Ashton, E. C. et al. 1954. A Luganda Grammar. London: Longmans, Green and Co.

Givón, T. 1970a. "On ordered rules and the Modified Base." Reprint from African Studies: Quarterly Journal. Johannesburg: Witwatersrand U. Press.

Givón, T. 1970b. Studies in Chibemba and Bantu Grammar. Unpublished doctoral dissertation, University of California, Los Angeles.

Givón, T. 1971. "The verbal origin of the Bantu verb suffixes." Studies in African Linguistics 2.2:145-164.

Maddox, H. E. 1938. Lunyoro Grammar. London: S. P. C. K.

Morris, H. F. and B. E. R. Kirwan. 1957. A Runyankore Grammar. Kampala: Eagle Press, East African Literature Bureau.

Meinhoff, C.-Van Warmelo. 1932. Introduction to the Phonology of the Bantu Languages. Berlin: Reimer, Vohsen.

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WHY AMHARIC IS NOT A VSO LANGUAGE

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1. Introduction

The verb is almost always last in Amharic clauses, and the subject is almost as consistently first. The order SVO only occurs in clefted sentences of the type əssu näw yämätt'a (he is that-came-he) 'He is the one who came'; OSV occurs when the object is topicalized [Getachew 1971:102].[1] Despite this fact that SOV order is almost universal in Amharic surface structures, Emmon Bach [1970: "Is Amharic an SOV language?"] was able to present an ingenious argument leading to the conclusion that the underlying order of Amharic basic constituents is VSO. This paper will review that article, and show how, in spite of Bach's insistence that positing underlying SOV order for Amharic leads to loss of generality and even violation of the widely accepted prohibition against logical quantification in transformational rules, a grammar with SOV deep order is superior to the grammar with VSO deep order. In the process Amharic comes to be seen as evidence against the theory of gapping proposed by John Ross [1970], and as evidence in favor of the theory of a non-linear base (as proposed by Gerald Sanders [1970] and Wallace Chafe [1970]).

Section 2 of this paper examines the main arguments presented by Bach that the facts require a VSO analysis of the deep order of Amharic main constituents. The result of this examination is the conclusion that the grammar of Amharic as a VSO language does indeed appear superior, but only marginally so, to the SOV grammar. Section 3 then shows that the advantage of the VSO grammar is equally present if we posit the order SOV, but with post-posed relative clauses and post-positions, neither of which, like VSO order, ever appear in Amharic surface structures. The success of

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[1] V and O are to be understood in their most general sense, with V including the copula, and O any verb-phrase complement. Where I have used Bach's examples, I have taken the liberty of conforming them to the phonemicization which is common in the literature on Amharic (ä = Bach's ə, phonetically [ə], ə = Bach's ɨ [ɨ]), and have also in some cases added morpheme boundaries.

this non-intuitive analysis brings into serious question the efficacy of the VSO analysis of Amharic. Section 4, therefore, compares the three differently ordered grammars of Amharic and reveals the generalization about Amharic syntax which permits rejection of Bach's hypothesis that it is a VSO language. With this generalization recognized, the grammar which posits SOV ordered deep structures is shown to be superior by the criterion of naturalness, and also in generality to grammars with other possible deep orders of constituents. Finally, Section 5 shows that, nevertheless, there is actually no evidence that the linear order of deep structure is a factor in stating the transformations in question, and hence in justifying grammars at this level. This is true since the generalization which permits the rejection of VSO ordered deep structures is true regardless of how deep structures are linearly ordered. An alternative hypothesis which thus suggests itself is that linear order is only specified post-transformationally, and deep structure is non-linear.

2. Amharic as a VSO language: arguments and counter-arguments

Six of Bach's arguments will be examined in Section 2. The first four of these may be called 'descriptive', since they are based on claims of greater simplicity, or increased generality in the grammar of Amharic with VSO ordered deep structures. The fifth and sixth arguments may be called 'explanatory', the latter offering an historical explanation of how Amharic, with no VSO ordered surface structures, could be a VSO language in deep structure, and the former explaining this by a proposed criterion of naturalness.

a. Gapping. 'Gapping' refers to the phenomenon illustrated by the following English sentences [Ross 1970:249]:

(1) a. I ordered mashed potatoes, Tom ordered peaches, and Suzie ordered liver.

b. I ordered mashed potatoes, Tom peaches, and Suzie liver.

That is, English, an SVO language, gaps as in (1b) to the right, in the pattern SVO - SO. Ross noted that Japanese, which is indicated by the criteria in Greenberg [1963] is a quite unambiguously SOV language, gaps to the left, in a pattern which can be represented as in (1c).

(1) c. Tom peaches, Suzie liver, and I mashed potatoes ordered.

Among SOV and SVO languages (the only two types which Ross dealt with, see Ross [1970:255]), some seemingly SOV languages (Hindi, German, and Turkish) do gap sentences both to the right and left, but no languages exhibit only the gapping pattern SOV - SO. That is, where the SOV - SO pattern occurs, it co-occurs with the SO - SOV pattern in seemingly SOV languages. Ross illustrated in a table comparable to (2) below the complex of facts about gapping in various languages which his theory of gapping sought to explain. The table shows that all languages surveyed do employ gapping, none have only the SOV - SO (B) pattern, and none have both the patterns A and B, or A and C, though both B and C occur in three languages as previously noted. The so-called 'free word order languages' Latin and Russian are said to have all three patterns: A, B, and C. (It would be interesting to know what source Ross used to determine the gapping patterns of Latin.) The pattern SO - SVO seems never to occur.

(2)

No gapping	A: Only SVO - SO	B: Only SOV - SO	C: Only SO - SOV
none	English French German (main clauses)	none	Japanese Siouan
A and B	**A and C**	**B and C**	**A, B, and C**
none	none	Hindi Turkish German (subordinate clauses)	Russian Latin

It is not possible here to examine Ross's article in detail (for this see Sanders [1970]). However, it is important to put the hypothesis presented there into perspective as speculative, and to recognize the conclusion as considerably under-determined by the evidence on which it is based. The particular part of Ross's argument which concerns Amharic is the "chain of inferences" [Ross 1970:253] which led him to the

conclusion that Hindi is only superficially an SOV language, having deep SVO order.

Ross found that almost all the facts summarized in (2) can be explained if it is hypothesized that (i) main constituent order uniquely determines gapping pattern: SOV order only allows gapping to the left (SO - SOV), and the SVO pattern gapping to the right (SVO - SO); and (ii) gapping is an optional "anywhere rule", i.e., applies before or after a "scrambling" or verb-inversion rule where such a rule exists in a language. But these two hypotheses are contradicted by Hindi and Turkish, which seem to be SOV languages, but which gap to the right (SOV - SO), as well as to the left (SO - SOV). The contradiction is this: When we begin with the conjoined structure SOV - SOV, gapping -- if it is only to the left in such cases -- can only yield the pattern SO - SOV. Hence Ross extended his hypothesis with an additional claim: (iii) Hindi and Turkish are deep SVO languages with an obligatory "scrambling" or verb-inversion rule; the string SVO - SVO can then by gapping yield SVO - SO, which scrambling will make SOV - SO, or, alternately, since gapping is an "anywhere rule", scrambling can apply first to yield SOV - SOV which by gapping would become SO - SOV. German, which has the gapping patterns of Hindi and Turkish in its subordinate clauses, and the surface orders SVO and SOV (subordinate clauses), gives support to the analysis, since it must have the verb-inversion rule which Hindi and Turkish are hypothesized to have. Thus the claims (i), (ii), and (iii) constitute an explanatory hypothesis which engrosses all the facts of (2).

Now, what of Amharic? Amharic, like Hindi and Turkish also apparently an SOV language, similarly has, according to Bach [1970], both gapping patterns: SOV - SO, and SO - SOV. His examples are:

(3) a. ənɛ bä-mäkina, wändəmm-e gən bä-babur mätt'a. (SO - SOV)
I by-car brother-my but by-train came-he
'I came by car, but my brother by train.'

b. ənɛ bä-mäkina mätt'a-hu, wändəmm-e gən bä-babur. (SOV - SO)
I by-car came-I brother-my but by-train
'I came by car, but my brother by train.'

Amharic appears to be like Hindi and Turkish in having SOV surface structures and two patterns of gapping. Bach [1970:11] accepts Ross's chain of inferences and is led to the conclusion that Amharic is therefore not a deep SOV language. But he also observes that another conclusion is available, namely:

> "It is false that deep SOV languages can only gap from right to left. If we draw [this] conclusion, then Ross's argument breaks down, and we must seek another explanation for the facts he presented, assumed here to be correct. Thus it is important to look for possible independent evidence about the deep order of Amharic sentences."

So Bach goes on to his other arguments.

But can we leave the gapping argument at this? Ross has presented an interesting theory of how facts about gapping might be explained. But the theory indulges in an uncommonly large degree of circularity. Its part (i) says that main constituent order uniquely determines gapping possibilities, and part (iii) says that all exceptions (Hindi, Turkish, and now Amharic) are due to a hypothetical rule of verb-inversion. Part (ii), which makes this possible, posits the existence of an "anywhere rule", which applies whenever it finds an ungapped but gappable string, but then only optionally.

In terms of such an explanatory theory the occurrence of two gapping patterns in Amharic does not reasonably constitute an argument for the existence of a verb-inversion rule. It rather tells us to hypothesize the existence of such a rule. The obligation is still completely on us to prove, on independent grounds, that the rule exists. This is true since the gapping theory itself is in need of substantiation which it can only gain by direct evidence that a verb-inversion rule is necessary in Amharic, or in Hindi or Turkish. The hypothesis itself cannot constitute evidence for the rule, especially when that hypothesis is based on as dubious a device as the "anywhere rule". However, if in our examination of Amharic we are unable to find any grammar-internal basis for treating the language as having other than deep SOV order, we concurrently do have evidence against Ross's theory of gapping.

Even if we accept the data on which Ross's theory is based (data brought into question by Dingwall [1969]), and allow the claim that the theory successfully explains the phenomenon of gapping in Subject-initial languages (a claim disproven, as will be seen below, in Sanders [1970]), there would still be no necessity to accept the theory itself. This is so because the facts about gapping explained by Ross's three claims can as adequately be explained with considerably less theoretical apparatus than that required by Ross.

The trick, recall, is to accomplish the following: (i) generate in SVO languages the gapped string SVO - SO, (ii) in some SOV languages the single gapped string SO - SOV, (iii) in other SOV languages the two possibilities SO - SOV and SOV - SO, (iv) in 'free word order languages' all three of these, (v) in every case to exclude the possibility *SO - SVO, and, of course, (vi) to do all this in a principled way. It seems, in fact, that there is a principle involved, a principle which has nothing to do with "anywhere rules" or with the linear order of deep structure.

Gapping reductions involve deletion of redundant verbs. Thus after reduction we have for all languages, excluding considerations of linearity, the string which can be represented ((S, (V, O)), (S, O)). There is only one verb in the string, but there are two objects. For all the languages in question here there is a general requirement that subjects be ordered first in surface structures (regardless of where and how in derivations such a condition is met). Now for SVO languages like English we can see that there is in addition either a 'verb second', or 'object last' condition on the order of non-subject elements in surface structures. For non-gapped sentences the result is the same when it is stated in either way: SVO. But if there were in these languages an 'object last' condition, this would predict the acceptability of the gapped surface structure SO - SVO, since this sequence fulfills such a condition. Since in fact such a string is prohibited, we may conclude that this class of languages has instead the 'verb second' condition. This requirement can permit only the gapped structure SVO - SO, since this possibility and not SO - SVO fulfills the condition of getting a 'verb second'.

Similar reasoning leads to the conclusion that Japanese-type languages have, in addition to the 'subject first' condition, a 'verb last' rather than an 'object second' condition. The only pattern of gapping which this requirement would permit would be the occurring pattern for these languages: SO - SOV. SOV languages of the Amharic/Hindi type, however, permit either SO - SOV or SOV - SO; that is, they appear to make no consistent choice between either the 'verb last' or 'object second' conditions. The 'free word order' languages, as Ross agrees, involve a convergence of the other three types; hence, appropriately, they allow all three gapping patterns: SO - SOV, SVO - SO, and SOV - SO.

This reasoning leads to two conclusions: 'subject first' languages, for their second rule, choose between either the 'verb second' or 'verb last' condition on surface order. In addition, if they make the latter choice, this may be interpreted as an 'object second' condition for application to cases of gapped conjunction. Derivation is then as follows, after the 'subject first' constraint is met for the language types in question (as indicated by -).

(4)

		Russian	
	Japanese	Hindi	English
	(S-(V,O)),(S-O)	(S-(V,O)),(S-O)	(S-(V,O)),(S-O)
Verb second	does not apply	does not apply	(S-(V-O))-(S-O)
Verb last	(S-O)-(S-(O-V))	does not apply	does not apply
Object second	does not apply	(S-(O-V))-(S-O)	does not apply
		OR: (S-O)-(S-(O-V))	

It will have perhaps been noted that one apparently ad hoc assumption has been necessary to make this simple 'theory' work: a 'verb second' condition may not be interpreted as an 'object last' condition in realizing the surface order of gapped conjunctions in SVO languages. This single ad hoc claim is necessary in order to have the theory fully engross the facts of (2). And there is no obvious reason why, when some SOV languages have a 'verb last' condition and others seem to have an 'object second' condition, SVO languages do not correspondingly have either a 'verb second', or 'object last' condition, but are limited to the 'verb second'

interpretation. (It is just conceivable that this gap could be accidental.) At present I have no good explanation in support of this necessary but ad hoc claim.[2] It simply seems to express the facts. However, it is important to see that, regardless of this problem, the theory of gapping which makes this claim is, overall, no more elaborate nor any less reasonable than Ross's theory. The two theories have the following comparable parts:

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[2]It seems to me that the combination subject-verb imposes considerably greater limitation on possible objects (or complements) than the combination subject-object imposes on possible verbs. Thus 'John opened' is quite sure to be followed by some openable, concrete object from a relatively limited list. But conversely, the sequence 'John a box' doesn't in a similar way limit the verb which follows. 'Sat on', 'opened', 'picked up', 'drew', and 'peered into' are almost equally possible, and the list of possible such verbs is considerably more difficult to begin to enumerate than the list of openable objects. This line of reasoning may make sense only because it is based on examples from an SVO language, English. But if it is basically correct, it would be reasonable that once a language developed dominant SVO order, it could as a result develop a dependence on the added redundancy that having the verb second permits.

For a language that does without this redundancy, however, e.g. an SOV language, it cannot make much difference which of the two objects in a gapped string comes second, or even whether the verb follows the first of these objects directly (i.e., in the pattern SOV - SO), or brings up the end of the sentence, as in the usual sentence (the pattern SO - SOV). But this will not deny the possibility that a particular SOV language may for basically stylistic reasons require the second of these two possibilities (as in Japanese, though apparently even in that language the gapping pattern SOV - SO doesn't have the ring of ungrammaticality that the pattern SO - SVO has in English).

This is sheer speculation for the present, but seems to me to offer a better line of research than the search for constraints on types of transformations in languages of different main constituent order-types (such as is carried on by Ross [1970], McCawley [1970], and Bach [1971]) constraints which, if they exist, will still probably require explanation in terms of the communicative purpose of language.

(5)

	Ross [1970]	Alternative (as in (4))
(i)	Linear order of main constituents determines direction of gapping.	Conditions which establish surface order of main constituents determine direction of gapping.
(ii)	Some superficially SOV languages have SVO ordered deep structures, and an obligatory verb movement rule.	Some SOV languages employ an 'object second' interpretation of their 'verb last' condition
(iii)	There are no surface SVO languages with SOV deep order, and a movement rule.	There are no SVO languages with an 'object last' interpretation of the 'verb second' condition.
(iv)	Gapping is an "anywhere rule".	- - - -

The two theories are quite parallel -- even to explaining things in near parallel terms -- up to the point where Ross posits the "anywhere rule". The alternative way of looking at gapping has no parallel for this claim. Nor does it require any parallel, since its claim (i) is maintained throughout, whereas Ross's claim (ii) allows for movement rules that would render his claim (i) inadequate if it were not for gapping's being an "anywhere rule"; i.e., basic and derived order of main constituents determine each a gapping pattern. Thus the movement rules are the weak link in the theory, necessitating the additional claim that gapping is an "anywhere rule". The existence of these movement rules is suspicious because of their absence in SVO languages, a fact attested in Ross's claim (iii). Ross himself [1970] has attempted, as have Bach [1971] and McCawley [1970], to discover some principle behind his claim (iii). A possible explanation for the necessity of claim (iii) in the alternative approach is given in footnote 2. However, it is sufficient for now to note that Ross's theory must fail anyway on account of the apparent fact (see below) that gapping cannot be an "anywhere rule". The alternative theory is consistent, however, with the discovery that gapping, like all conjunction reduction, is post-cyclic.

Sanders [1970] shows that gapping is just one aspect of the general process of conjunction reduction, which takes place after the position of

elements in surface structure is finally established. This is made clear by examples (except for 6b from Sanders [pp. 5-7]) such as:

(6) a. i. Nicholas drank vodka and Alexander water.
ii. Vodka was drunk by Nicholas and water by Alexander.
b. i. Bees swarmed in the garden and gnats on the porch.
ii. The garden swarmed with bees and the porch with gnats.
c. i. I like rice well-cooked and well-seasoned.
ii. I like well-cooked and well-seasoned rice.

These sentences show that:

> "If coordinative reduction operates on ordered structures, then all grammatical surface orderings in the language must be available for such operation and no re-ordering of constituents needs to be specified subsequent to it. Moreover, as evidenced by [6d-f], coordinative reduction, if it applies to ordered structures, not only can apply to surface orders alone, but in some cases at least, must apply only to such orders." [Sanders 1970:5-6]

(6) d. i. John wrote a letter to the president, and Bill to the governor.
ii. *John wrote the president a letter, and Bill to the governor.
e. i. John chased the dog, and Bill the cat.
ii. *The dog was chased by John, and Bill the cat.
f. i. *I like well-cooked and rice well-seasoned.
ii. *I like well-cooked rice and well-seasoned.

In (6d-f) three hypothetical movement transformations have applied after conjunction reduction, in (d) and (e) the gapping type of reduction in particular. All these cases resulted in ungrammaticality. The examples of (6a-c) show that conjunction reduction, including gapping, can be delayed until the post-cyclic stage, and the examples of (6d-f) that gapping can't apply before at least three transformations. Gapping does not appear to be an anywhere rule, and Ross's theory of gapping loses its mainstay. With it goes the ability of that theory to say anything about the deep order of Amharic main constituents.

A final comment on gapping: the gapped Amharic sentences of (3) are not freely occurring sentences of the language. Two Amharic speakers to whom I showed these sentences differed in their judgements of them. One remained unhappy with both; another accepted both, but after some puzzlement. It would be useful to have relatively unusual sentences of this sort judged by complete monolinguals, since we have little idea of how knowledge of another language might affect the judgements of bilinguals. It may not be just coincidental that the gapped sentence (3b), whose existence Bach considers to contradict the surface order of Amharic, is the sort that occurs in English, the language most likely to influence present-day Amharic, and certainly the idiolect of Bach's informant.

b. Genitives and relative clauses. The first independent argument that Amharic is a VSO language begins with two observations: (i) possessor-possessed phrases in Amharic are introduced by the prefix yä, which is identical to the verb prefix which marks relative clauses; (ii) such possessive phrases are "presumably derived by reducing relative clauses with 'have' constructions..." [Bach 1970:12]. Thus (7a) and (7b) below are paraphrases:

(7) a. yä-ənə bet 'my house'
of-I house
b. (ənə) yä-allä-ň bet 'the house that I have'
(I) of-is (to)me house

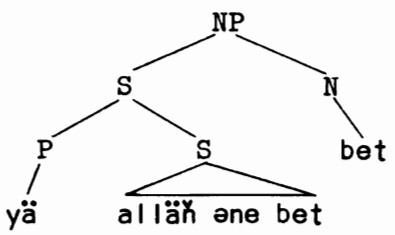
As an indication that these two yä's are lexically identical it can be shown that both are deleted (or, at least, do not occur) after any other prefix. For example:

(7) c. bä-ənə bet 'at my house'
at-I house
d. *bä-yä-ənə bet
at-of-I house
e. (ənə) bä-allä-ň bet 'at the house that I have'
(I) at-is (to)me house
f. *(ənə) bä-yä-allä-ň bet
(I) at-of-is (to)me house

The rule disallowing yä in this environment is not phonologically conditioned, but seemingly refers specifically to yä as a prefix; Bach notes the phrase yä-yäkatit 'of (the month of) Yakatit' in which the phonological syllable yä follows a prefix but is not deleted.[3] He proposes a derivation of possessive phrases as below from relative clauses with the clause in VSO order; derivation of the unreduced clause is also illustrated in (8):

(8)

P-marker



Derivation

	a. Genitive phrase	b. Relative clause
	[yä [alläñ əne bet] bet]	[yä [alläñ əne bet] bet]
	NP S	NP S
NP deletion	ø	ø
Copula deletion	ø	does not apply
yä-attachment	yä-əne	yä-alläñ
Verb-shift	does not apply	əne yä-alläñ
	yä-əne bet	əne yä-alläñ bet
	of-I house	I of-'have'-I house
	'my house	'the house that I have'

[3]That the mmə of yämmə, the full relative marker with Amharic imperfect verbs, remains when yä is deleted shows that yämmə is yä + mmə, a further sign that the yä which marks relative clauses is a preposition. Loss of a yä syllable occurred in an earlier stage of Amharic, cf. verbs such as hedä 'go' < käyädä; qärrä 'remain' < qäräyä. The modern rule yä- --> ø/Prep__ could be a remnant of this formerly phonologically conditioned deletion. [Leslau 1968: sections 71, 75]

This manner of derivation requires a "rule of copula deletion, a rule attaching yä to the next element to the right -- call it yä-attachment -- and, of course, Verb-shift, a rule putting the verb form at the end of the clause, applying in that order". The derivation of a genitive construction from reduced relative clauses in an SOV ordered structure, Bach says, requires

> "two rules for yä-attachment, one affixing it to a verb at the end of the clause, if there is one, otherwise to the first element in a noun phrase... What we miss in this analysis is the generalization that yä is attached to the next lexical element, no matter what it is, and since we have two rules, we fail to explain the identity of the two elements in the two rules." [1970:13]

Let us grant that Amharic relative and genitive yä prefixes are in some fundamental sense identical; the homophony and the independence of the reduced relative clause analysis of genitives which can connect them up make this reasonable. Still, Bach's first argument for VSO structure fails, The derivation illustrated in (8) is said to have a certain advantage. What this comes down to is the assertion that the verb first structure allows a single rule of yä-attachment for both relative clauses

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[4]All the Amharic prepositions, including those which function as subordinating conjunctions, pattern like bä and yä. The clitics which mark adverbial clauses are, like the prepositions, prefixed to verbs. The following examples with əndä- 'like', 'as' are typical (from Bach [1970:18]):

a. yohannəs əndä-abbaṭu gäzzä
   John like-father-his ruled-he
   'John ruled like his father'

b. yohannəs abbaṭ-u əndä-gäzza gäzza
   John father-his like-ruled-he ruled-he
   'John ruled like his father ruled'

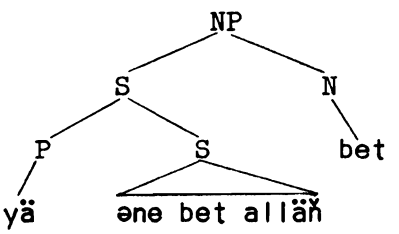
The generalization about Amharic grammar which correctly accounts for the distribution of yä and bä will therefore handle all these.

and genitive constructions. That is, in the VSO relative clause, yä is always attached "to the next element to the right". If the verb is deleted, that next element is the noun phrase destined to become a genitive or possessor. If the verb remains in an unreduced relative clause yä is attached to it, and the rule of Verb-shift carries yä along when the verb is positioned at the end of the clause.

However, the advantage of positing a single rule of yä-attachment is also present in the derivation from an SOV ordered structure, if we simply order attachment after the rule which the SOV analysis has in lieu of Verb-shift: a rule which for the present can be called 'yä-shift'. This rule moves yä and puts it before the verb of a relative clause. Since the point is important, the SOV derivation comparable to (8) is illustrated in (9). The necessary rule of verb agreement is irrelevant, and has been assumed in both (8) and (9).

(9)

P-marker



Derivation

	a. Genitive phrase	b. Relative clause
	[yä [əne bet allăň] bet]	[yä [əne bet allăň] bet]
	NP S	NP S
NP deletion	∅	∅
Copula deletion	∅	does not apply
yä-shift	does not apply	əne yä allăň
yä-attachment	yä-əne	yä-allăň
	yä-əne bet	əne yä-allăň bet
	of-I house	I of-'have'-I house
	'my house'	'the house that I have'

The number of transformations and the apparent complexity of their operations is precisely the same in (8) and (9). Yä-attachment in both cases says: 'Attach yä to the next element to the right'. Thus the identity of relative and genitive yä is expressed in the same way in both.

At this point we have two approaches which are fundamentally different only in (i) deep order of main constituents -- the point at issue -- and (ii) in the element moved by transformation: if we begin with the order VSO (we may call this the abstract analysis) a rule of Verb-shift is required, and if we begin with SOV order (the concrete analysis), a rule of yä-shift.

c. Preposition attachment. Additional arguments for Amharic as a VSO language are said to "converge on the conclusion that there would be a rule of Verb-shift". The first of these concerns the attachment of prepositions in noun phrases. The prepositions may be attached to the first of a series of simple modifiers which precede their head noun, or to the verb of a relative clause, and otherwise to the noun itself.[4] Bach's examples [p. 12] are:

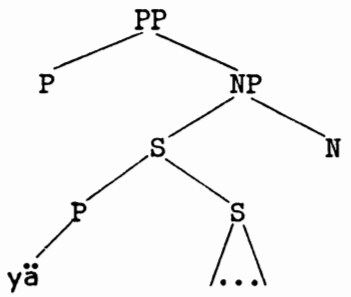
(10) a. yä-yohannəs bet 'John's house'
b. bä-yohannəs bet 'at John's house'
c. (əne) yä-ayyä-hu-t bet 'the house that I saw'
(I) of-saw-I-it house
d. (əne) bä-ayyä-hu-t bet 'at the house that I saw'
(I) at-saw-I-it house

He says:

> "Under [the VSO analysis] we need only assume that [the rule of yä replacement required by the examples of (7)] applies after yä-attachment and before Verb-shift in order to get examples like [10b] and [d]. The preposition will then be shifted along with the verb. Consider the alternative under [an SOV analysis]. Once again it would be necessary to split the rule into two cases, one for immediately adjacent instances of yä, the other for yä which is attached to the verb at the end of the sentence." [1970:12]

But, as in the previous argument, this fails to recognize that in number of operations the alternatives are completely equivalent if under the concrete analysis yä-attachment is ordered after the movement rule. Under the concrete analysis derivation begins with a structure like (11):

(11)



That is, underlying (10b), the string:

(12) a. [bä [[yä [yohannəs bet allăw] bet]]
PP NP S S

at of John house 'has'-he house

Or, for (10d):

(12) b. [bä [[yä [ənə bet ayyä-hu-t] bet]]
PP NP S S

at of I house saw-I-it house

From (12a), which yields (10b), if the copula allăw is deleted, we get:

(13) a. bä yä yohannəs bet

From (12b), the input for (10d), without verb deletion, we get:

(13) b. (ənə) bä yä ayyähut bet

In each case with the SOV analysis we need a rule stating that when the verb remains, prepositions (including yä) are attracted to it. That is, rather than yä-shift in lieu of Verb-shift, we must speak of Preposition-shift. In the derivations of both (10b) and (10d), after Prep-attachment the rule of yä-deletion discussed above in connection with the examples of (7) applies:

(14) yä --> ∅ / Prep-___ X

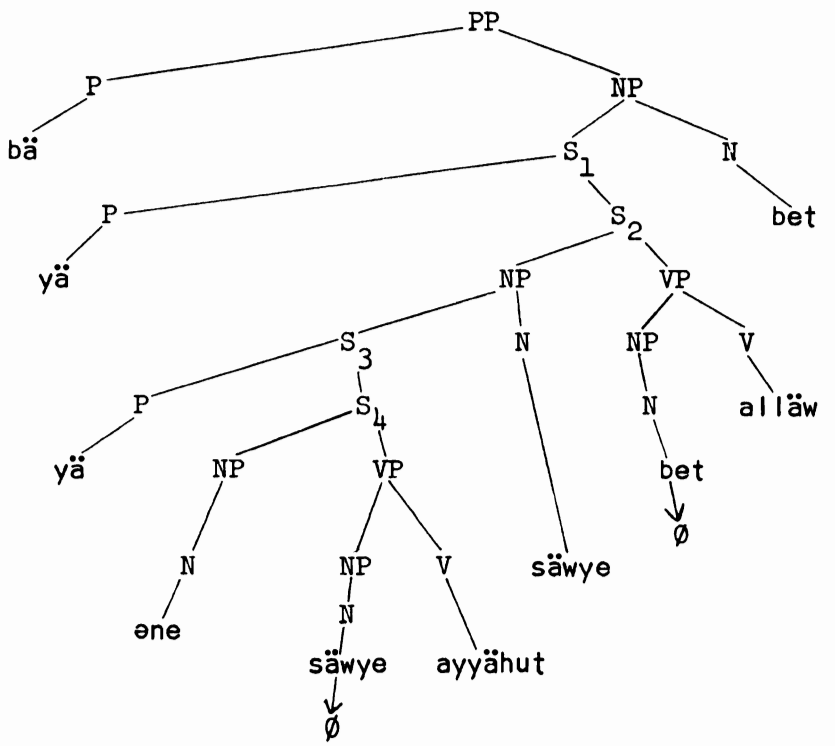
Under the abstract analysis we have Verb-shift, and under the concrete analysis Prep-shift, or Prep-attraction. There is no discernible difference in number of transformations or in their complexity. The next section concerns Bach's claim that indeed Preposition-shift suffers from a fatal complication.

d. Does Prep-shift require logical quantification? Next, let us consider the claim that "there is a stronger argument against the [SOV analysis]" [Bach 1970:13]. This concerns a purported violation by the concrete analysis of the constraint against logical quantification in transformational rules. Imagine, begins the argument, derivation of the phrase which would translate 'at the house of the man that I saw'.

(15) (ənə) bä-ayyähut säwye bet
(I) at-saw-I-it man house

This involves "a noun phrase [which] contains a relative clause inside a relative clause....the outer relative clause is reduced by Copula deletion, and further...the whole noun phrase stands in a prepositional phrase" [ibid]. The tree diagram (16) illustrates the SOV ordered structure in question.

(16)



After the obligatory identical noun deletions indicated in (16) we should derive (17).

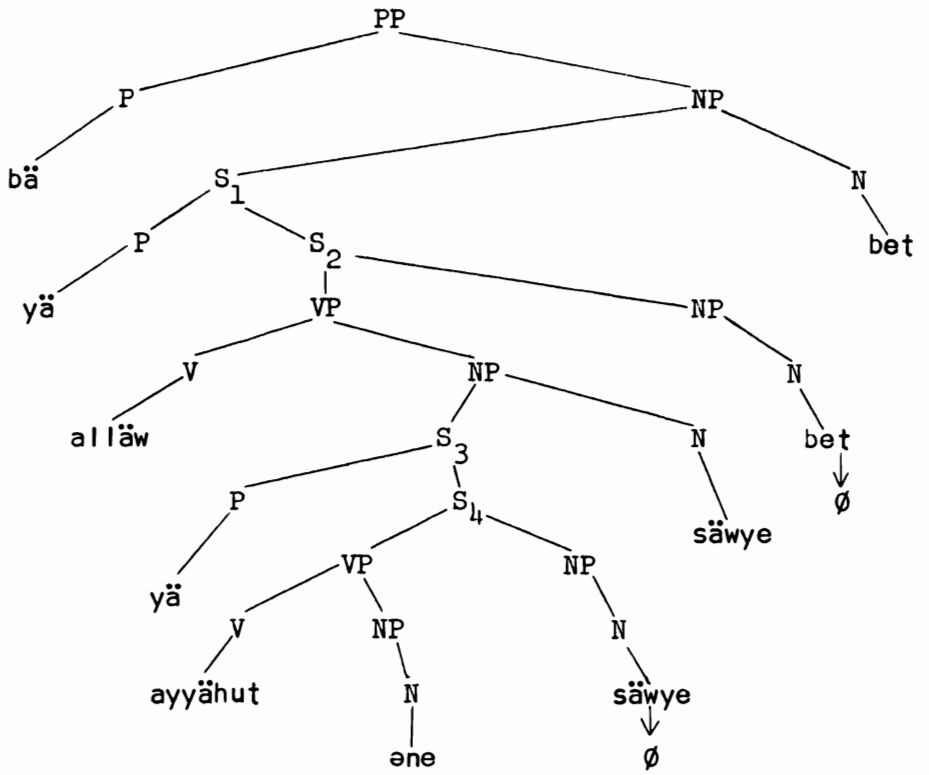
(17) (ənə) yä-ayyähut sawye bä-alläw bət
(I) of-saw-I-him man at-'has'-he house
'at the house that the man that I saw has'

(17) is derived just in case the copula alläw in the higher clause (S_2) is not deleted. However, in the case in question alläw is deleted in S_2 in order to derive the shorter phrase (15). As Bach correctly observes, the rule that must move yä or other preposition to a verb may be stated unconditionally in the S_1 cycle only when that verb is the clause-final element. But in (16) when alläw is deleted in S_2 other material will stand between the righthand clause-boundary and the verb ayyähut of S_4 to which the prepositions including yä must now be attached. And that material is of theoretically infinite length. In (15) the moved preposition needs to step over only the simple noun säwye, but that noun potentially can be modified by an indefinitely long string of adjectival and other simple modifiers; for example, instead of ənə bä-ayyähut säwye bət 'at the house of the man that I saw', we might have the string underlying 'at the house of the tall, thin, important...man from Kenya that I saw': ənə bä-ayyähut räǰǰəm, qäčč'ən, təlləq...yä-kenya säwye bət. Such an example is just to illustrate Bach's point that the rule of preposition movement which the concrete analysis requires is "impossible to state as a transformation (in Chomsky's sense), since it is necessary to use logical quantification in the part of the structural description corresponding to the phrase 'the last [=rightmost] verb form in the... clause [of the cycle in process]': ... [$_S$ X Verb Y] NP ... where there is no verb in Y" [ibid, p. 14]. Therefore, it does seem that if we want to maintain the constraint against logical quantification in transformational rules, we must rule out the rule of Prep-shift. Unless we can find a way to avoid the necessity of logical quantification in the rule, we have cause to reject the SOV analysis of Amharic deep main constituent order which employs that rule. Fortunately, such a solution does exist. By way of introduction to that discussion, let us first note a necessary condition on the rule of

Verb-shift, the rule which the abstract VSO analysis of Amharic requires instead of Preposition-shift.

The rule of Verb-shift has to be last-cyclic. Last-cyclic application is necessary for this rule in the cases of VSO ordered structures such as underlie (15), in which one of the verbs can be deleted, or in which both yä and a preposition precede one of the verbs. Diagram (18) illustrates the VSO ordered structure which parallels (16) and underlies (15) and (17) in the VSO analysis of Amharic:

(18)



In (18), if the copula allläw is deleted, the yä at its left in S_1 as well as bä should be attached to the verb of S_4 in order to give the correct result in (15). Recall that Prep-attachment in the VSO analysis simply attaches a preposition to the item to its right. But if Verb-shift has applied cyclically, in the S_4 cycle ayyähut will have moved to the right of its clause, stranding the yä of S_3. Similarly, if the copula of S_2 is not deleted in order to derive (17), cyclic application of Verb-shift in that cycle would move allläw to the right, now stranding

the yä of S_1. The preposition of the higher cycle, bä, in the VSO analysis is supposed to be attached, on its cycle, to yä -- and hence to allăw where it remains; and if allăw is deleted, to yä of S_3 -- and hence to ayyähut where it belongs in the derivation of (15). Now if Verb-shift is a cyclic rule, bä will be unable to simply attach to the right. (Note that the problem of stranding will remain for bä even if we make yä a sister of the NP and VP of subordinate sentences. Bach has posited the S_1 and S_3 nodes, and since ultimately nothing is at issue in this, I have retained them here.)

The way to solve this little problem is to make Verb-shift last-cyclic, as Bach has noted [1970:16]. In each cycle Prep-attachment will apply after deletion rules uniformly and at once whenever its structural description is met; last-cyclic Verb-shift will then move just the right prepositions: those attached during earlier cycles to verbs. So, last-cyclic Verb-shift saves the day for the VSO analysis of Amharic. It is worthy of a passing observation here that, when we succeed in rejecting the VSO analysis of Amharic, we also show this seemingly necessary employment of the notion of last-cyclic rules to be unnecessary.

Bach sees the necessity that Verb-shift be last-cyclic as no particular drawback to the VSO analysis, but suggests that this necessity is reasonable "since rules like Verb-shift in many languages seem to act differently in dependent and independent sentences. Thus in German verbs occur at the end of the sentence in dependent clauses, and in English only non-embedded questions have inversion, and so on" [ibid].

If Verb-shift in the VSO analysis of Amharic can be made workable by last-cyclic application, we should consider whether a similar solution is available for the problem with Prep-shift in the SOV analysis. In fact, with addition of one condition, it is. Notice, in the SOV ordered structure (16), that a last-cyclic rule which combines Prep-shift and Prep-attachment in a conjunctively ordered sequence can assure correct derivation of (15) or (17) as follows:

Working from left to right on the string at the bottom of (16), the preposition bä does not meet the environment of the rule of Prep-shift, having no verb as the right-most member of the Prep-phrase cycle, and undergoes Prep-attachment, being attached to the item to its immediate right, the yä of S_1; now, these two combined (bä-yä) when the copula in S_2 is not deleted, meet the environment of Prep-shift and are prefixed to allläw (bä-yä-allläw). If allläw is deleted in order to derive (15), the environment of Prep-shift fails and the sequence bä-yä is attached to the item to its right, the yä of S_3, which with bä-yä prefixed meets the environment of Prep-shift, and is moved over and prefixed to the verb of S_4, yielding bä-yä-yä-ayyähuṭ. And this, by two applications of Prep-deletion (rule (14)), gives the correct output bä-ayyähuṭ. (In a slight variation we could say that the rule of Prep-deletion is a persistent rule deleting any yä- /Prep-__ as soon as the sequence occurs, so that we never get anything but one preposition shifted at a time.)

In this way the SOV analysis of Amharic gives the right results without violation of the constraint against logical quantification in transformations. The disadvantage of this solution is, however, the necessity that Prep-shift and Prep-attachment apply conjunctively from left to right in the last cycle. In positive terms, the advantage of the VSO analysis is that its rules of Prep-attachment and Verb-shift apply straightforwardly, though Verb-shift must be last cyclic.

In fact, there is a way to bring about a solution with SOV ('concrete') ordered structures that does not require the extraordinary left to right condition on application of Prep-attachment and Prep-shift. This solution has nothing to do with last-cyclic application of rules, or the linear sequence of items in the structural description of transformational rules. Before turning to discuss this solution, however, it is possible to finish

up the consideration of Bach's argument that Amharic is a VSO language. His final syntactic argument is too sketchily drawn to permit an accurate counter-argument, but it does not appear to accomplish anything that the SOV grammar constructed above does not also accomplish. Let me go on to two other points which he makes, 'explanatory' arguments, which will perhaps be very persuasive to some linguists: one concerning naturalness in syntax, and one concerning a historical development in Amharic.

e. Syntactic naturalness. Bach has argued that an SOV analysis will not work, though we have seen that it does, if awkwardly. Perhaps ultimately more important is his criticism that the solution which an SOV analysis of Amharic requires is not 'natural', since it employs a movement rule of a sort which seems not to occur in languages, moving a clitic to an "arbitrarily far removed and deeply embedded item" [1970:14]. Here recall that the revised, last cyclic rule of Prep-shift does not involve movement to a "deeply embedded item", but rather to a verb as the rightmost item of the clause. The objection on grounds of naturalness can only remain, then, an objection to moving a preposition rather than a verb (to an "arbitrarily far-removed item"). The VSO analysis requires moving a verb an arbitrary distance, but such movement is said to be clearly necessary in languages such as German, in which "we must either assume that the verb is positioned as in English and have a rule moving it to final position in subordinate sentences or assume it is given initially in end position and shift it to the second position" [ibid]. This conceivably could be the strongest argument yet in favor of Amharic as a VSO language, though, as Bach admits, in the absence of better ideas about naturalness in syntax, it is not, for the time being, a strong one. There are two obvious counter-arguments.

The first of these parallels the non-naturalist position in recent controversy in phonology, namely: if Amharic illustrates an unusual situation, ought it not be described by an unusual (i.e., 'un-natural') rule? The second counter-argument is a naturalist argument; it simply observes the fact that the surface order VSO never occurs in Amharic,

and asks the question: 'What could be more unnatural than deep linear order which never has surface realization?'

Moreover, looking at Amharic from a different perspective permits a different line of thought about what is unnatural about Amharic. This is not the fact that it has an SOV order of main constituents; many languages have this order -- and there is no logical reason for believing that this order is any less natural or more marked than the orders SVO, or VSO (if these three are indeed less marked than OSV or OVS order). What is odd, and problematic about Amharic is its failure, as noted by Schwartz [1971], to indicate the beginning of an embedded sentence. Others [Dawkins 1969:87-88 and Ullendorff 1965:8-9] have commented on the complexity of Amharic syntax, without noting this specific cause. Since there is nothing illogical about SOV order, it is not reasonable to suppose that the learner of Amharic, child or otherwise, is obligated to abduce an underlying VSO order, with a verb-movement rule, in order to overcome the real perceptual problem -- the non-clause-initial position of the subordinator yä and the prepositions which replace it. A rule of verb-movement can only indirectly express this vagary of Amharic syntax, by saying that the subordinators get moved out of logically desirable position by virtue of being prefixed to the verb. Why would not a learner simply treat the problem at its source, and abduce a rule moving just the subordinators, provided the rule can be made explicit? This rule of preposition movement will express the vagary directly.

f. Historical considerations. The historical argument that Amharic is a VSO language begins with the observation that "Comparative Semitic evidence alone would lead us to conclude that the Ethiopic Semitic languages have undergone a syntactic change and that originally the verb was positioned at the head of the sentence" [Bach 1970:19]. It is commonly believed that Ethiopia is an area of Semitic instrusion (ca. 1000-700 B.C.) from South Arabia into a region of north-east Africa where the substratum was Cushitic, a family which today exhibits SOV syntax. VSO order is common in earlier Semitic -- typically in Ge'ez, and in Classical Arabic and Biblical Hebrew, for example. Many peculiarities of Ethiopian Semitic relative to common

Semitic have been explained as due to the influence of Cushitic. A hypothesized change in Amharic from VSO to SOV can be (and has been: Leslau [1945:73]) similarly explained. Bach recognized that the question cannot be left at this point, since what is of interest is not only why, but by what mechanisms in the grammar could such a fundamental change come about. The addition of a single rule, verb-movement, as a late (in fact, last cyclic) rule is the best hypothesis, he suggests.

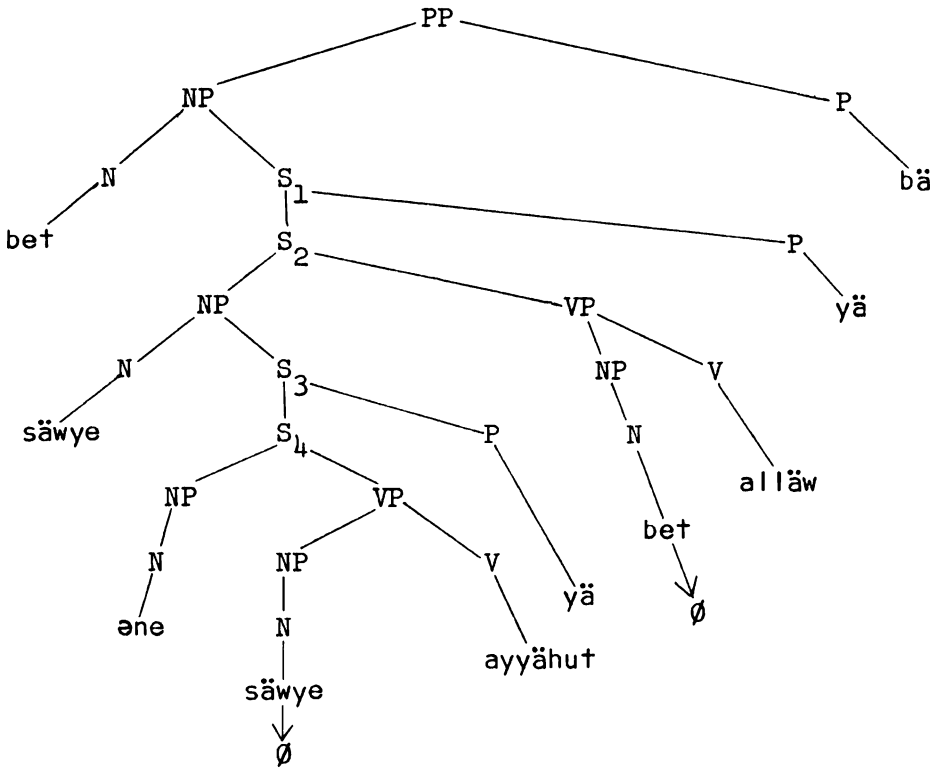
Even if it was apparent that Proto-Ethiopian Semitic was a VSO language, the conclusion would not follow either (i) that SOV syntax results originally from addition of a verb-movement rule, of (ii) that a later generation of Amharic speakers would be able to abduce such a movement rule in the face of nothing but SOV ordered observable sentences. Again a parallel with controversy in phonology is clear, and the conclusion has been anticipated. The ultimate concern of linguistic description is the psychological reality of a grammar rather than the form which directly reflects historical developments. It is only be determining what is psychologically real that what is truly natural can be determined in a non-circular way; and while some such circularity cannot be avoided, it has to be recognized that the theory of generative grammar is at present strong enough to make many descriptions conform to preconceptions of naturalness based largely on diachronic considerations.

3. Amharic as the near mirror-image of a VSO language

At this point it is clear, perhaps, that there is not a lot of difference between the VSO and SOV analyses of Amharic; and the choice between them is not obvious. Both are completely workable, and criteria of naturalness and language history are too ambiguous to permit a choice. The VSO analysis is somewhat preferable on grounds of elegance, since Amharic as an SOV language requires an unusual condition on its rules of Prep-attachment and Prep-shift. But, as Bach was forced to recognize [1970:16], this advantage which the VSO analysis holds, will have to be shared with its near mirror-image (Bach refers to it as a mirror-image, but an actual mirror-image of VSO order is OSV, rather than SOV). The advantage of the abstract analysis derives from having prepositions

including yä immediately next to the verbs to which they attach, and this advantage is also present if we set up "underlying structures which are exact [sic] mirror images of those we have posited; that is, we assume verb end order, but place the relative clause after the noun phrase that it modifies, and let yä and prepositions follow" [Bach 1970].

(19)



"In this way," Bach goes on, "we avoid the necessity of a Verb-shift rule, but we are forced to give a rule for preposing prepositions" [ibid]. There is also an added necessity for a rule preposing relative clauses.[5] In order to maintain the superiority of the VSO analysis it was necessary for Bach to give arguments against structures like (19). Two are given: (i) two rules are necessary to get the relativizer yä in the right position, one to move it before a noun in cases where the verb has been

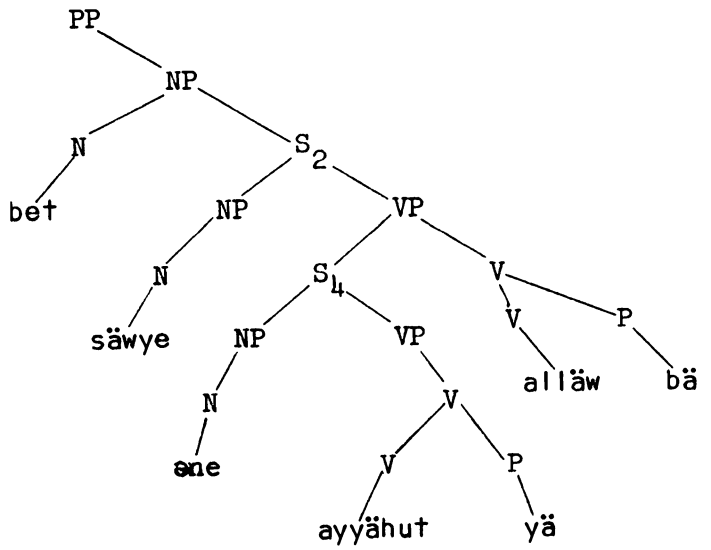
[5]Bach neglects this problem since he believes that relative clauses might, indeed, be postposed in Amharic deep structure. He refers in two places [1970:16,19] to Amharic relative clauses acceptable to his informant which are positioned after their head. Such clauses are, to say the least, most extraordinary.

deleted (säwye-yä --> yä-säwye 'of the man'), and another to move it before the undeleted verb (säwye alläw-yä --> säwye yä-alläw 'that the man has'); (ii) the second argument against (19) is that "under the [VSO analysis] we have a 'natural' explanation for the fact that yä is a prefix, whereas under the [near mirror-image] hypothesis it is simply an accident" [1970:17].

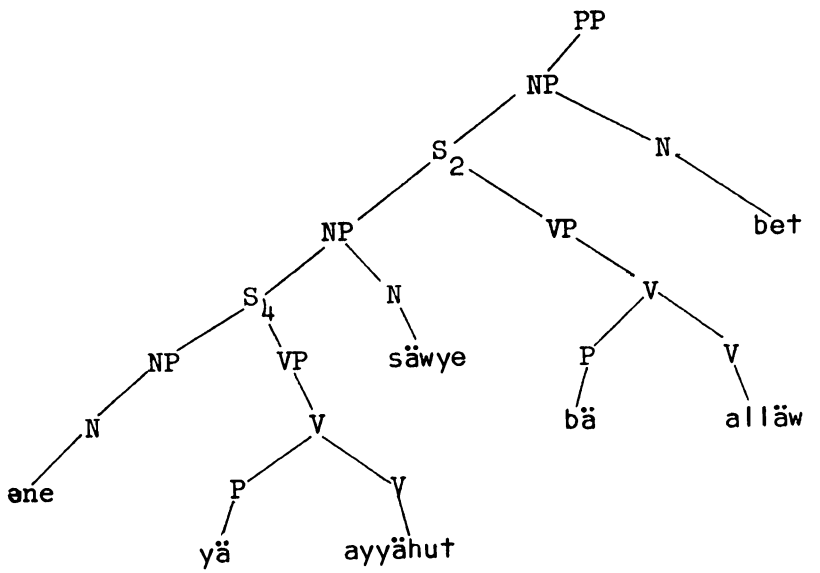
The latter argument against the 'near mirror-image of VSO' analysis, if it has any validity, can be paraphrased and used against the VSO analysis itself: under an analysis with SOV ordered deep structures we have a 'natural' explanation for the fact that the verb is last in Amharic surface structures, whereas under the VSO hypothesis this is simply an accident. As for the former argument, there is no reason to my knowledge why the two cases of "prepositioning" cannot be collapsed into one: namely # X-Prep # --> # Prep-X #. As a matter of fact, derivation from (19) is almost as efficient as that from a VSO ordered structure like (18). The point is important, since it reveals the exact nature of the advantage which the VSO analysis holds, and also further underlines the element of arbitrariness in selection among different deep orders of constituents. Therefore derivation of (17) from (19) is illustrated below. Deletions and Prep-attachment are cyclic. Prep-deletion is the mirror-image of the previously discussed, persistent rule version in (14). Two post-cyclic rules are needed: Relative clause preposing, and Prepositioning. (19b) shows the result from (19) after identical noun deletion, and Prep-attachment. (19c), then, is from (19b) by Relative clause preposing and Prepositioning. (19c) underlies (17). If the copula alläw is deleted in S_2, bä will be attached in (19b) to the next item to the left, yä of S_4. At this point Prep-deletion applies, deleting yä and permitting derivation of the shorter phrase (15): ənə bä-ayyähut säwye bet 'at the man I saw's house'.

This manner of derivation, even though it requires two last cyclic rules of movement, might even find support in the fact that the two clitics bä and lä which generally function as prepositions, also frequently do occur postposed on verbs where their heads are anaphoric pronouns:

(19) b.



(19) c.



allä-bbä-t 'is present-in-it'; lakä-lla-ň 'sent-to-me'. This analysis of Amharic deep constituent order has the advantages that it (i) permits the SOV order of main constituents in deep structure, (ii) avoids, if this is assumed undesirable, a rule moving a preposition an arbitrary distance, and (iii) still expresses in a direct way the perceptual difficulty brought about in Amahric by the surface position of the clause subordinators: affixed to verbs and hence deeply embedded in the clause. The

The difficulty here would be attributed to a phrase structure rule which at the deepest level of syntactic structure postposes these items on dependent clauses.

We now have three analyses to choose among: (i) the totally concrete analysis, with SOV order, pre-posed relative clauses and prepositions; (ii) the semi-concrete analysis, with SOV order with post-posed clauses and postpositions; and (iii) Bach's abstract analysis, with VSO order, pre-posed clauses and prepositions. The VSO analysis requires a post-cyclic rule of Verb-shift. The semi-concrete analysis requires two last-cyclic rules applying in any order. Finally, the totally concrete SOV analysis requires two last-cyclic rules ordered conjunctively and applying from left to right. The semi-concrete analysis seems somewhat superior in generality to the totally concrete SOV analysis, and slightly less general than the VSO analysis.

3. Amharic as an SOV language

The superiority of the VSO analysis lies in the generality of its rule of Prep-attachment: prepositions always attach to the item to their right. The inferiority of the concrete SOV analysis lies in two things: (i) the left to right condition on application of its rules of Prep-attachment and Prep-shift, and (ii) the condition that its rule of Prep-attachment come, whenever applicable, after the rule of Prep-shift. For a moment let us focus on the latter problem. The rule, with its two conjunctively ordered cases, may be given as:

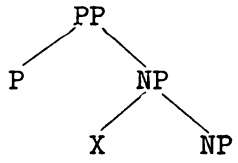
(20) $\underset{1}{\underline{W\ [_i}}\ \underset{2}{\underline{Prep}}\ \underset{3}{\underline{X}}\ \underset{4}{\underline{Y}}\ \underset{5}{\underline{]_i\ Z}} \Longrightarrow \left\{\begin{array}{ll} 1\ 3\ 2\text{-}4\ 5 & \text{where } Y = V \\ 1\ 2\text{-}3\ 4\ 5 & \text{otherwise} \end{array}\right\}$

If these two rules could be reversed, and the second, 'otherwise' case of (20) made cyclic, we would have a solution with SOV ordered deep structure completely comparable to that with VSO order. That is, we want Prep-attachment to apply cyclically in just those cases where the last-cyclic rule of Prep-shift will not apply. In other words, all 'true' prepositions, and the subordinators (yä and others) whose verbs have been deleted should attach to the next item to their right.

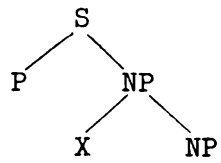
Now note that the class of prepositions which should undergo Prep-attachment, 'true' prepositions and the subordinator yä in cases when

the copula is deleted, share a common feature. 'True' prepositions always occur in the configuration (21a), where X may be null. And in a clause from which the copula and an identical noun have been deleted (a reduced relative clause), yä remains in the very similar configuration (21b), as sister to an NP.

(21) a.



b.

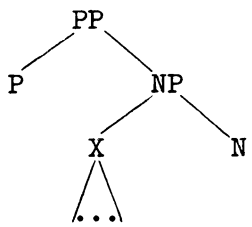


This reveals that the rule of Prep-attachment, if ordered after copula and identical noun deletion may be stated as follows:

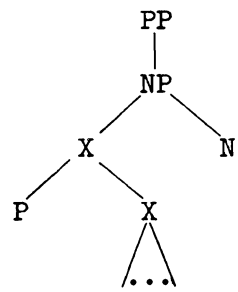
(22) W [Prep [X NP] Z
NP
1 2 3 4 5 ⟹ 1 2-3 4 5 where X may be ∅
and 2-∅ 4 = 2-4

Prepositions attach to the item to the right just when their sister is a noun phrase -- whose rightmost item is a noun or another noun phrase. Since, however, except for cases derived through conjunction reduction, all rightmost nouns or noun phrases can have only one sister -- a sentence or sentence derived modifier, the result of applying Prep-attachment by rule (22) will be as in (23): (23a) by rule (22) becomes (23b).

(23) a.

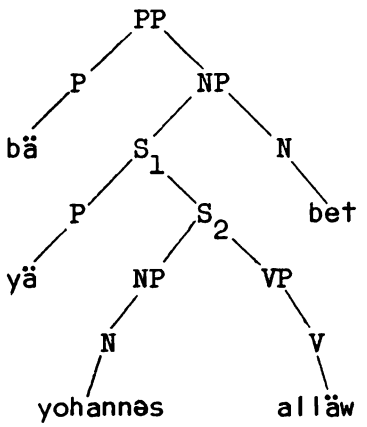


b.

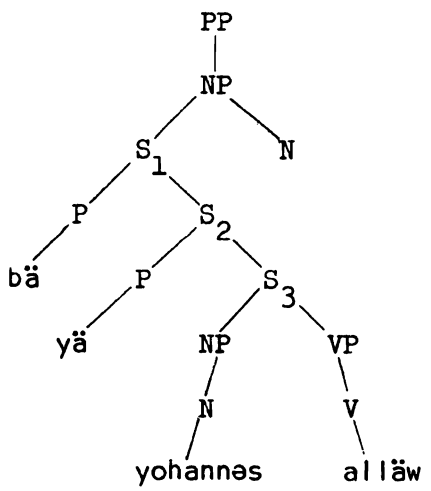


The preposition is Chomsky-adjoined to X. Thus, for the structure underlying an Amharic phrase of the sort in question, yohannəs bä-alläw bet 'at the house (that) John has', application of rule (22) to (24a) gives (24b):

(24) a.



b.



Prep-attachment to the right, which requires that the preposition be sister to a noun phrase, will no longer apply in (24b), but there are two prepositions which should undergo Prep-shift. The rule of Prep-shift can now be recognized as applying only when the right sister of a preposition is a sentence. The rule of Prep-shift may now be written as in (25):

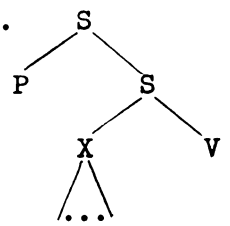
(25) W [Prep [X V]] Z

S

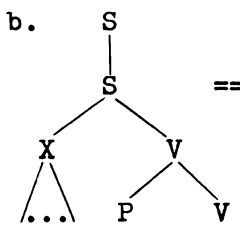
1 2 3 4 5 ⟹ 1 3 2-4 5

Prep-shift applies in a configuration like (26a), to yield a configuration like (26b), which by tree-pruning becomes (26c):

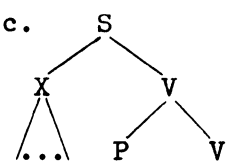
(26) a.



⟹ b.

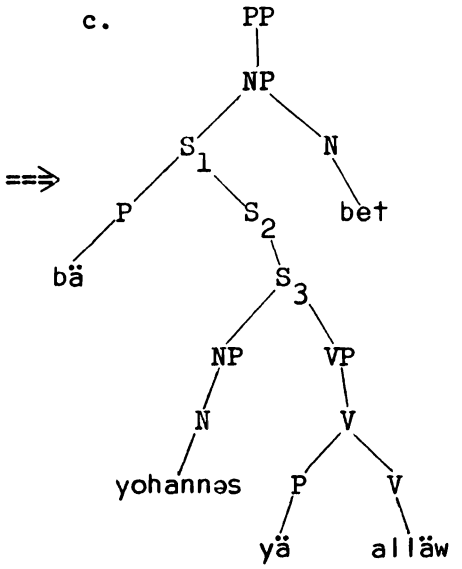


⟹ c.

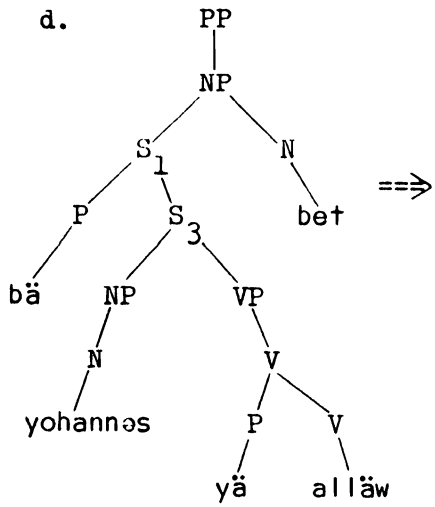


The structure given in (24b) includes one environment for the rule of Prep-shift as formulated in (25), at S_2, and another at S_1. If Prep-shift applies first on yä of S_2, we get (24c) which via tree-pruning becomes (24d). (24d) still has an environment for Prep-shift at S_1 which applies to yield (24e). Again tree-pruning applies resulting in (24f), from which yä is deleted by rule (14).

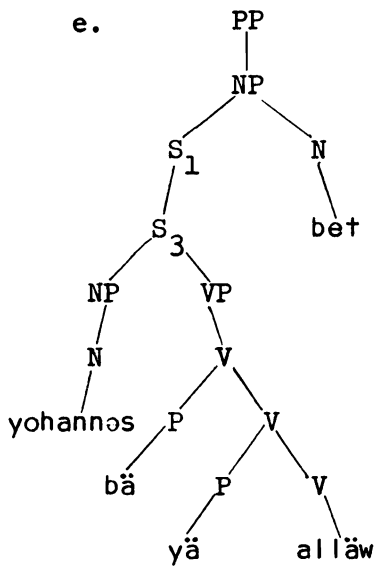
(24) c.



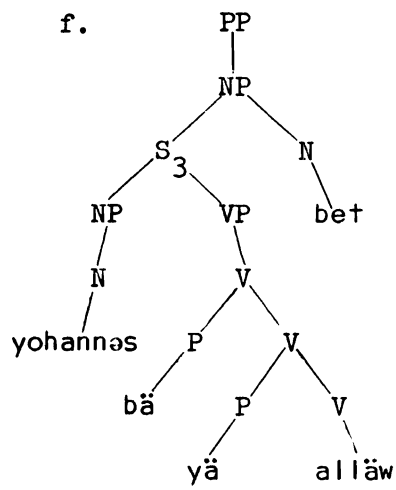
d.



(24) e.



f.



It may seem that there is a problem in structures like (24b) where there are two environments requiring Prep-shift, and a necessity that they apply in a cyclic (lower environment first) manner. Counter-cyclic intrinsic order is necessary in order for Prep-attachment in the highest cycle to provide an input for Prep-shift in the S_1 cycle (as in (24b) from (24a)). But if these rules apply <u>simultaneously</u>, this difficulty need never arise, and, regardless of how deeply embedded configurations like (24) are, the two rules of Prep-attachment and Prep-shift will apply

simultaneously and persistently, resulting in an intrinsically ordered sequence giving the right output. No statements about cyclic or non-cyclic application are required; the rules apply wherever and whenever their environments are met as the result of either the phrase structure rules or previous transformations.

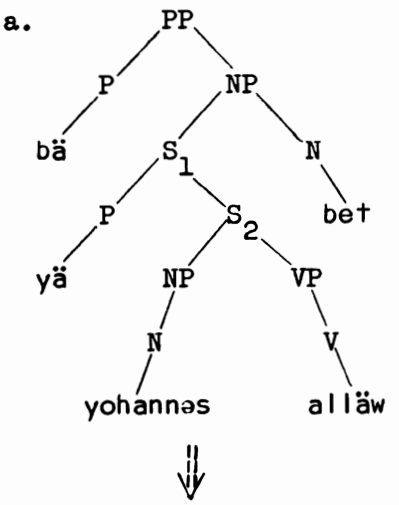
With this formulation of the two rules determining the position of the prepositions, we achieve a grammar of Amharic with fully concrete SOV ordered deep structures which is surely quite as efficient as that with VSO ordered deep structures. Both have a simple, straightforward rule of Prep-attachment, and a straightforward rule of movement: the VSO grammar moves a verb, and the SOV grammar a preposition. Thus the SOV grammar duplicates the VSO grammar in every significant detail except for the linear order of main constituents in deep structure. The VSO analysis could now be rejected on the simple grounds of naturalness, since it posits a deep order of constituents which never occurs in surface structures, and for no gain in any other part of the grammar.

The VSO grammar is also slightly inferior in generality to the SOV analysis, as measured by conditions necessary on the application of its transformations. The SOV grammar's rules of Prep-attachment and Prep-shift are ordered only intrinsically with respect to one another, and there is no necessity to speak of last-cyclic rules or their cyclic application. Intrinsic ordering, and persistent rules, such as have been found to express the complex embedding of Amharic prepositions in the grammar with SOV ordered deep structures, are certainly more general, hence more highly valued than extrinsic ordering, and cyclic/last-cyclic application of rules.

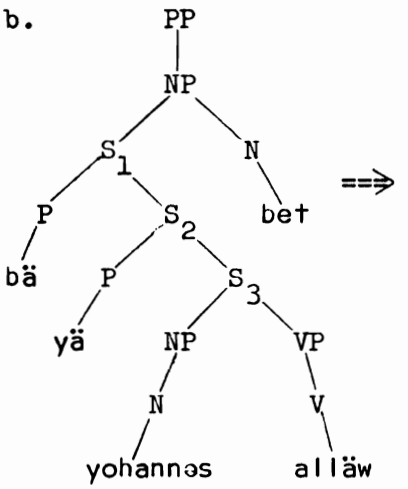
Intrinsically ordered syntactic rules are perhaps uncommon enough to require further illustration of how they work in this case. In a configuration like (27a), which underlies the phrase yohannəs bä-alläw bet 'at the house that John has', we have environments both for Prep-attachment and Prep-shift, for Prep-attachment directly under PP, and for Prep-shift under S_1. Thus, if the rules are unordered extrinsically, either can apply, or both. Prep-attachment will apply to give (27b), and Prep-shift to give (27c). Simultaneous application results in (27d). (27d) has a

derived input for a second application of Prep-shift under S_1, the output of which is (27e). Prep-deletion then applies to give the final output (27f):

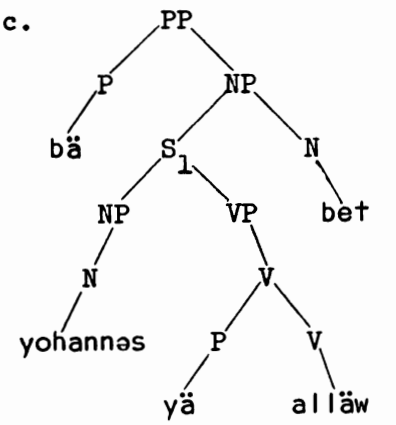
(27) a.



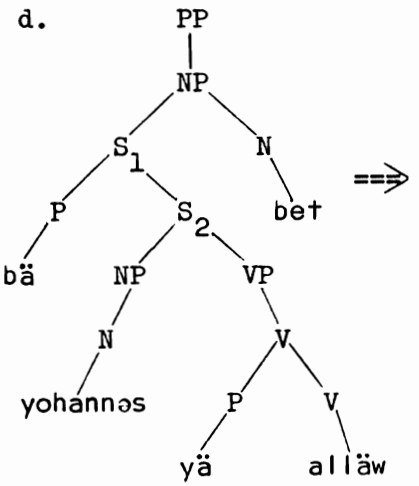
b.



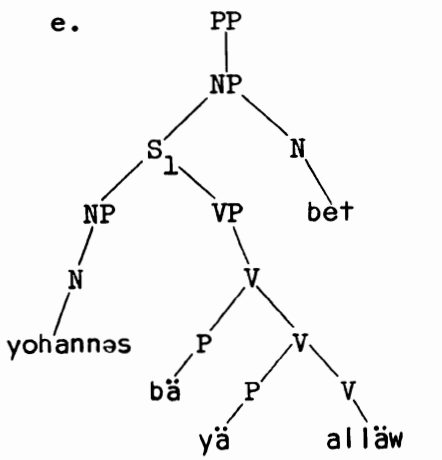
(27) c.



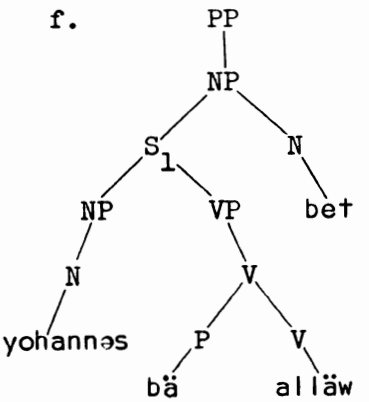
d.



(27) e.

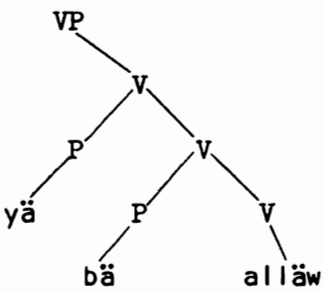


f.



There remains one small difficulty. Note that Prep-shift applying in (27d) must not fail to adjoin bä at the higher of the two V's which fulfill the environment of Prep-shift, the lower of which dominates only alläw. If bä were adjoined to the lower V, we would get the sub-tree (28), which would not undergo Prep-deletion, besides being logically wrong:

(28)



There are a couple of obvious ways to prevent this, the best of which is, for now, to assume the convention that a Chomsky-adjoined sequence including a bound morpheme cannot be separated, a convention historically supported by -- and reflective of -- the long recognized tendency of such units to metamorphose, and in time to become unrecognizable as consisting of separate units.

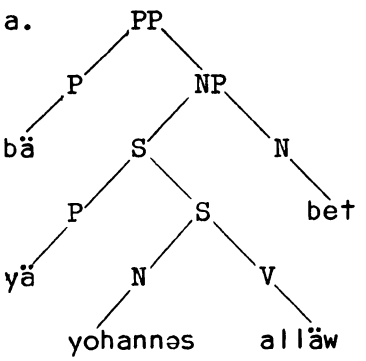
4. Conclusion: On the non-linearity of deep structure

The VSO analysis of Amharic has now been shown to be inferior on two counts: (i) it is unnecessarily abstract, positing a deep order of elements which is never realized in the surface structures of Amharic; and (ii) it is slightly less general in terms of number of conditions required on application of transformations. There are no longer grounds for considering Amharic to be a VSO language -- at any level. There seem to be in fact no grounds for considering Amharic to be anything but an SOV language at surface and deep levels. No one would question that Amharic is an SOV language at the level of surface structure. But what are the grounds for considering Amharic to be an SOV language at the level of deep structure? I am not so sure that there are any. None have been presented in this paper. We have simply rejected the VSO analysis (and, by extension, the semi-concrete analysis with postpositions and post-posed relative clauses).

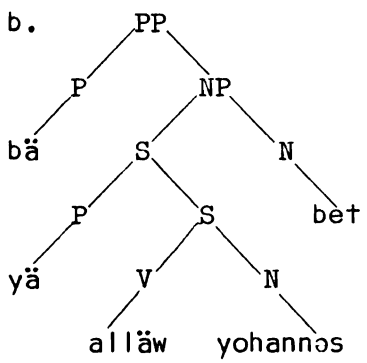
But the basis of the argument presented in rejection of the VSO analysis is not really concerned with the linear order of constituents in deep structure. The generalization about Amharic grammar that renders the VSO analysis pointless is that in linear deep structure a preposition (always a leftmost element relative to its sister), in a configuration with a sentence as sister, is prefixed to the rightmost element in that sentence -- a verb; while a preposition in a configuration with a noun phrase as sister, is prefixed to the element to the preposition's immediate right in that NP, regardless of what that element is. But the terms 'right' and 'left' in this statement are not necessary.

Among the three treatments of Amharic deep linear order considered in this paper (including the semi-concrete alternative), there is agreement about the hierarchical or logical structures which underlie the Amharic surface structures under discussion, in particular prepositional phrases with embedded sentences such as that which underlies the phrase yohannəs bä-alläw bet 'at the house (that) John has'. The SOV analysis has (29a), the VSO analysis (29b), and the semi-concrete analysis (29c).

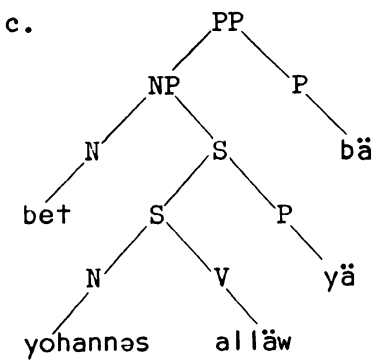
(29) a.



b.



c.



Except for linearity, these trees are the same. Through the use of labeled brackets, all three can therefore be represented as the non-linear string (30), where the commas indicate that no linear relationship is specified between the items they separate:

(30) [bä, [[yä, [yohannəs, alläw]],beŧ]]
PP NP S S

Now if deep structure is non-linear, as has been claimed by Gerald Sanders [1970], Wallace Chafe [1970] and others,[6] we would require rules to specify the linear order of elements at the level of surface structure (linearization rules), and these rules would apply post-transformationally to the non-linear configuration derived by the transformations from the non-linear, base-derived configuration (30). The configuration (31) represents the archi-structure for (29a), (29b) and (29c), i.e., with linearity abstracted. Such a grammar claims that hierarchical structure without linearity is sufficient for specifying the input and output of all operations other than those which state the linear sequence of elements in surface structure; and these last rules take non-linear, archi-structures as input, and give linear structures as output.

The final versions of the rules of Prep-attachment and Prep-shift may themselves be written in non-linear form. The rules apply to phrases with P as one sister. There are two possibilities: one in which the other sister is a noun phrase, and the other in which it is a sentence. (P cannot be termed 'preposition', since it is a deep category which

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[6]J. F. Staal [1967] concluded that the non-linear base was necessary for describing the free word order phenomenon in Sanskrit, and was also correct on intuitive grounds for universal grammar. Two recent arguments for non-linear deep structure are papers by Peterson [1971] and Anderson [1971].

Chomsky [1965:123-127] mentioned previous proposals for the non-linear base and dismissed them for reasons which are unclear to me from present perspective, but which were seemingly based on a belief that the structural indexes of transformations are necessarily too complex to be expressed without linearization, a function which had therefore just as well be accomplished by the base rules.

includes what are in other languages linearized as post-positions. The possibility remains that at a higher level of analysis 'P' is simply a sort of predicate, the subject of which may be a noun phrase, or a sentence.[7])

(31) Prep-attachment$_1$

[P, [X, N]]		[[[P, X], N]]
PP _ NP _ _____	==⇒	
1 2 3 4 5		1 3 2-4 5 where X may be ∅

(32) Prep-attachment$_2$ (formerly Prep-shift)

[P, [X, V]]		[[X, [P, V]]]
PP _ S _ _ ___	==⇒	
1 2 3 4 5		1 3 2-4 5

These rules are oblivious to linear order of input, and would as easily accept the VSO or SOV ordered deep structures, or any other possible linear combination which preserves hierarchical structure. The linearization rules for Amharic will then establish such facts as that P in Amharic is a preposition (rather than a post-position), and that the verb is the last element in its clause, etc.[8]

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[7]That Amharic 'genitive' yä must be derived in the base as other than the relative clause conjunction (a position that has been accepted in this paper for convenience), is shown by the fact that it is used to express a great variety of expressions which might be termed 'partitive', such as yä-wärq sä'aṭ 'watch of gold', and yä-sä'aṭ wärq 'gold for a watch', phrases which have no unitary relative clause paraphrase. For discussion of these and many other examples see Hailu [1964]. Cf. Chomsky's comment: "it seems to me to make good sense to regard [a phrase of this type as] a determiner-noun-complement construction which constitutes a simple base noun phrase" [1970:196].

[8]Full illustration of the manner of derivation of phrases such as have figured in this paper, in a grammar employing linearization rules, is given in another paper: 'Is deep structure linear?'. Elsewhere (a paper on 'The relative clause in Amharic') I have also attempted to show how the complex embedding of prepositions in Amharic relative clauses has come about historically, without there ever having been a stage of Pre-Amharic with a rule of verb-movement, or VSO main constituent order.

By discovering the generalizations about the syntax of Amharic prepositions which correctly represent their logical function, and fully describe their surface distribution, we have actually failed to show the SOV analysis of the deep order of Amharic main constituents to be correct. Rather we find that the accounting for of these facts does not make reference to 'deep linear order'. This conclusion should not be surprising, since such a conclusion is merely a function of the fact that except for the case of structures derived through conjunction reduction, there are never two sister constituents of the same type. Thus transformational rules may as easily make reference by label to the elements of a phrase-marker which they affect, as to their linear position.

Bach's argument that Amharic is at the level of deep structure a VSO language is the best argument I know that crucially depends on deep linear order in order to express a seeming generalization about a language. If that argument fails it is difficult to imagine what sort of direct (non-metatheoretical) evidence could be brought in support of selection of one or another linear order of elements in deep structure. By (i) refuting the argument that Amharic is a VSO language, and by (ii) showing that the correct generalization is simply unconcerned with the linearity of deep structure, I hope to have suggested in a rather forceful way why (iii) the burden of proof that deep structure is linear rests on the shoulders of those who believe it is.

REFERENCES

Anderson, Lloyd. 1971. "Transformations don't exist?" in Papers from the Seventh Regional Meeting of the Chicago Linguistic Society, pp. 3-19. Chicago: Chicago Linguistic Society, University of Chicago.

Bach, Emmon. 1970. "Is Amharic an SOV language?" Journal of Ethiopian Studies 8.1:9-20.

Bach, Emmon. 1971. "Questions." Linguistic Inquiry 2:153-166.

Chafe, Wallace. 1970. Meaning and the Structure of Language. Chicago: University of Chicago Press.

Chomsky, Noam. 1965. Aspects of the Theory of Syntax. Cambridge: M.I.T. Press.

Chomsky, Noam. 1970. "Remarks on nominalization," in Readings in Transformational Grammar, pp. 184-221. Edited by Roderick Jacobs and Peter Rosenbaum. Waltham, Mass.: Ginn.

Dawkins, C. H. 1969. The Fundamentals of Amharic. Addis Ababa: Sudan Interior Mission.

Dingwall, William Orr. 1969. "Secondary conjunction and universal grammar." Papers in Linguistics 1.2:207-230.

Getachew Haile. 1971. "The suffix pronouns in Amharic," in Papers in African Linguistics, pp. 101-112. Edited by Chin-Wu Kim and Herbert Stahlke. Edmonton, Alberta and Champaign, Ill.: Linguistic Research Inc.

Greenberg, Joseph. 1966. "Some universals of grammar with particular reference to the order of meaningful elements," in Universals of Language (first paperback edition), pp. 73-113. Edited by J. Greenberg. Cambridge: M.I.T. Press.

Hailu Fulass. 1964. "The particle yä in Amharic." Rassegna di Studi Etiopici 20:103-119.

Hudson, Grover. 1971. "Is deep structure linear?" Unpublished paper, University of California, Los Angeles.

Hudson, Grover. 1972. "The relative clause in Amharic." Unpublished paper, University of California, Los Angeles.

Leslau, Wolf. 1945. "The Cushitic influence on the Semitic languages of Ethiopia: a problem of substratum." Word 1:59-82.

Leslau, Wolf. 1968. An Amharic Reference Grammar. Mimeographed, University of California, Los Angeles.

McCawley, James. 1970. "English as a VSO language." Language 46:286-299.

Peterson, Thomas. 1971. "Multi-ordered base structures in generative grammar," in Papers from the Seventh Regional Meeting of the Chicago Linguistic Society, pp. 181-192. Chicago: Chicago Linguistic Society, University of Chicago.

Ross, John. 1970. "Gapping and the order of constituents," in Progress in Linguistics, pp. 249-259. Edited by M. Bierwisch and K. E. Heidolph. The Hague: Mouton.

Sanders, Gerald. 1970. Invariant Ordering. Mimeographed. Bloomington: Indiana University Linguistics Club.

Schwartz, Arthur. 1971. "General aspects of relative clause formation." Mimeographed, University of California, Santa Barbara.

Staal, J. F. 1967. Word Order in Sanskrit and Universal Grammar. Dordrecht: D. Reidel.

Ullendorff, Edward. 1965. An Amharic Chrestomathy. London: Oxford University Press.