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In addition to the general sessions, several colloquia on various language groups or on selected topics of common interest are planned. One of these, partly as a result of the "African Languages in the 80's" conference held at Michigan State University, will be devoted to the problems of teaching African languages. Persons interested in organizing a colloquium should contact the Conference Coordinator to make the necessary arrangements. Papers will be limited to twenty minutes.

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*From the editor,*

Beginning with Volume 11 (1980), the three issues of *Studies in African Linguistics* will be dated April, August, and December rather than March, August, and December as in previous years. This will allow the journal to appear at more evenly spaced intervals throughout the year.

Let me remind readers and potential contributors to the journal that we have instituted a "Notes and Queries" section, the first contribution to which is found in this number. Papers for this section may be short comments on papers which have appeared in SAL or elsewhere, or short descriptive or theoretical remarks concerning African languages which do not warrant full articles.

Finally, we would like readers' opinions on the following matter: the UCLA African Studies Center is considering changing SAL to a typeset format. In order to keep production costs (and hence subscription rates) constant, this would mean that there would be only two numbers of the journal appearing per year. The amount of material per volume would remain the same as in past years. If you have an opinion about this change, positive or negative, please take a minute to drop us a note or simply indicate your opinion below and send us this page or a copy.

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Studies in African Linguistics
Volume 10, Number 3, December 1979

# ONCE MORE ON THE NATURE OF DOWNDRIFT

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In this paper is proposed a motivation for the unmarked, neutral intonation to end on a low note, and it is suggested that the most natural means of implementing this pattern may be a gradual fall, which reflects most closely the decreasing relaxation pressure generated by the passive forces of exhalation. Further, it is claimed that downdrift develops in stages: of lows only, of highs after lows, and of sequences of highs. Hombert's [1974] proposal that the development of downdrift may be blocked or stopped where it would threaten perceptual confusion is endorsed. Inasmuch as the implicational hierarchy of types of sequences which will exhibit downdrift in a given language which is predicted by the proposed development is consistent with various attested systems, the proposed development provides an explanation for the nonexistence of certain other types of systems.

## 0. Introduction

Hombert [1974] establishes a causal relationship between the extent of downdrift, that is whether or not it applies to sequences LLLLLL, HLHLHL, and HHHHHH, and the types of phonemic tonal contrast that exist in particular languages. For example, in Yoruba sequences of lows downdrift, but highs alternating with lows and sequences of highs do not. Hombert argues that the existence of a phonemic mid tone blocks downdrift of high tone in Yoruba since were highs to downdrift this could could lead to perceptual confusion. The relationships between the phonemic contrast and the extent of downdrift in several languages is represented in the chart given in (1), which is taken from Hombert's excellent study.

(1)

| H-H-H | L-L-L | H-L-H | Possible Contrasts | Languages |
|---|---|---|---|---|
| 0 | 0 | 0 | A, B, C | Dschang (dial. Bamileke) |
| 0 | 0 | 1 | A, B | NOT ATTESTED |
| 0 | 1 | 0 | A, C | Yoruba |
| 0 | 1 | 1 | A | Igbo |
| 1 | 0 | 0 | B, C | NOT ATTESTED |
| 1 | 0 | 1 | B | NOT ATTESTED |
| 1 | 1 | 0 | | Impossible |
| 1 | 1 | 1 | | Hausa, Shona |

A = H-H vs. H-'H or H-M  B = L-L vs. L-'L  C = L-H vs. L-'H or L-M

Hombert's study reaches the following conclusion:

> "Downdrift is a natural, unmarked intonation with an ultimate but as yet unknown articulatory motivation. But this process can be blocked when it threatens to obscure a tonal contrast." [1974:178]

In addition to the obvious question of the unknown articulatory motivation, Hombert's study also raises the question of the non-attestation of languages with certain types or extents of downdrift; these can be seen in (1). It is not made clear whether this non-attestation is a result of our present meager knowledge of tonal systems, or whether some principled explanation could be proposed for the non-existence of such types of systems. The discussion below is concerned with the nature and the development of downdrift, and it will attempt to suggest answers to both these questions.

1. An Explanation for Downdrift

The intonational nature of downdrift is affirmed by Hombert, who offers Hausa as an example of the many languages which exhibit downdrift in statements but not in questions. The existence of a universal or near-universal neutral, unmarked intonation pattern has been noted by many scholars, e.g. Bolinger [1964], Lieberman [1967]. Bolinger [1964] refers to this as a "running-down pattern". In my opinion this "running-down" should be associated with a fall in subglottal pressure (Psg) which results from relaxation or lack of activity of expiratory muscles when the pressure generated by the passive forces of exhalation is below that required to drive the glottis. Further I contend that the "running-down pattern" can vary from language to language, for example, in what percent-

age of the utterance of intonational unit is characterized by the "running-down". I prefer to characterize this pattern as "ending on a low note".

The glottis requires a relatively constant transglottal pressure drop of 2-3 $cmH_2O$ to phonate at a quiet speech level [Draper et al. 1959]. The transglottal pressure drop equals the subglottal pressure minus the supraglottal pressure. When supraglottal pressure remains the same changes in transglottal pressure drop are a function of Psg. Although supraglottal pressure does not always remain constant, in order to simplify the discussion, this condition will be assumed to be the case,[1] and therefore in the remainder of the discussion I will refer to Psg and not transglottal pressure.

Psg is a function of the active and passive forces of respiration and the degree of aperture at the glottis. The last factor can be ignored for the discussion below (tensing the laryngeal muscles has the effect of reducing the aperture at the glottis and thus increasing Psg) since I will only be concerned with subglottally-induced changes in Psg, i.e. those that might be said to correspond to expiratory force.

The passive forces of exhalation include gravity, torque, and tissue elasticity (cf. Zemlin [1968:107] which all act to restore the lungs and rib cage to their original unexpanded and unraised state. The amount of relaxation pressure generated by these passive forces is primarily a function of the volume of air in the lungs. In (2) the Psg generated by the passive forces is represented by the diagonally-sloping line.

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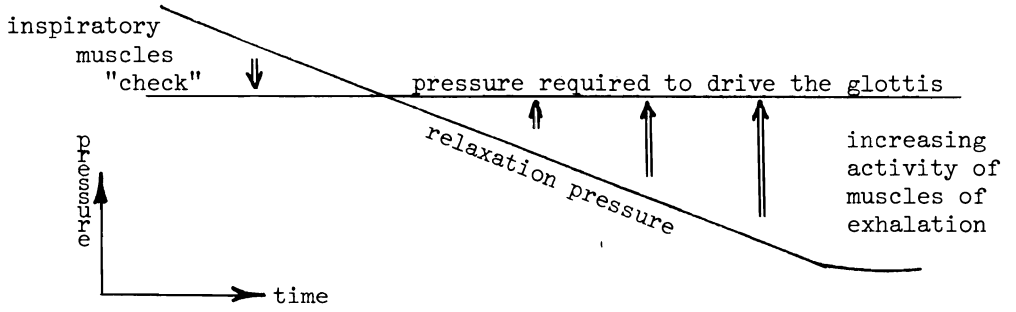
[1] In fact, it seems that expiratory force, i.e. subglottally-induced Psg, does not adjust itself to compensate for changes in supraglottal pressure in order to maintain a constant transglottal pressure drop. Consider, for example, the intrinsic amplitude of vowels. Lehiste and Peterson [1959] found that the close vowels [i u], where supraglottal pressure is greater, have a sound pressure level 5dB lower than for an open vowel like [a]; in other words, Psg does not increase to maintain the same sound pressure level. In fact perceptual tests reported by Lehiste and Peterson [1959:431] indicate that listeners equate the subjective quality of "loudness" with effort (expiratory force = subglottally-induced Psg) rather than with absolute sound pressure level. Another case would be the voiced stops where Bell-Berti [1975] has shown that rather than an increase in activity of the expiratory muscles, the larynx is lowered to increase the volume of the supraglottal cavity in order to maintain a sufficient amount of transglottal pressure drop.

(2)




The active forces are the muscles of inhalation and exhalation. When the Psg generated by the passive forces is greater than that needed to drive the glottis at a given speech (loudness) level, the muscles of inhalation contract to "check" the descent of the rib cage. According to Ladefoged [1967:25] in conversational speech at a normal level usually there is little or no checking.

In speech the muscles of exhalation become active when the relaxation pressure generated by the passive forces is insufficient to drive the larynx (at the desired level). There is increasing activity in these muscles as the relaxation pressure is further reduced, as the volume of the air in the lungs drops. However, this increasing activity in the muscles of exhalation which compensates for the continuously lowering relaxation pressure resulting from the passive forces of exhalation cannot indefinitely continue to generate the necessary Psg to drive the glottis. For one thing, the relaxation pressure may become so low, say, at the end of a very long utterance, that the contraction of the muscles of exhalation may not be able to raise the Psg to the necessary level and thus voicing may be inhibited. Second, before one can inspire again, the muscles of exhalation must relax since the Psg must be lower than atmospheric pressure for inspiration to occur. It may be suggested that this need for there to be a lower Psg to get ready for the next inspiration is a motivation for the unmarked intonation bearing a pattern of ending on a low note.

It is important to note that it is not suggested here that the fall at the end of each utterance or smaller intonational unit bearing the un-

marked intonation is caused by a need to relax the expiratory muscles in order to get ready for the next inspiration, nor is it caused by the volume of air in the lungs getting so low that no amount of expiratory muscle activity will raise the Psg generated by the passive forces of exhalation enough to reach the minimum level needed to drive the glottis. The need for there to be a lower Psg would be physiologically motivated only in some cases, but the pattern of ending on a low note has been internalized and has become a general, habitual pattern.[2]

As will be suggested below different languages may generalize different strategies or means of implementation, in particular different patterns of expiratory muscle activity for achieving this low (Psg) at the end pattern. In most languages the unmarked intonation will coincide with the particular strategy, that is, the fundamental frequency curve which is used for the unmarked intonational unit, e.g. in statements, will reflect the subglottally-induced Psg, i.e. disregarding changes in Psg due to changes in the aperture at the glottis. The marked intonational unit will generally involve laryngeal modification, for example in English adjusting laryngeal tension in order to create a rise in fundamental frequency even while the Psg is falling at the end.

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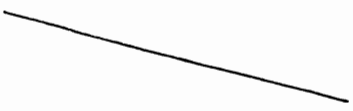
[2] Lieberman [1967] claims that the unmarked pattern of low at the end is the result of a generalization of the ontogenetically primary and innate pattern found in the cries of infants. Given that the basic cry is an attention-getting device, the infant utters a cry for as long as it can. Lieberman [1967:44] suggests that "...at the end of expiration when the lungs collapse to a certain critical point, a set of overriding respiratory reflexes automatically induce inspiration." In this connection Lieberman refers to the Hering-Breuer reflex. On my reading Widdicombe [1964:602] does not indicate that the Hering-Breuer reflex would occur in the type of situation described by Lieberman, especially in man. However, as noted above, I do believe that the need for Psg to drop in order to prepare for the next inhalation is important. Given that the pattern in question is generalized very early, it does seem to be a reasonable approach to search for a physiological motivation for this fall in the speech characteristics of infants rather than in the speech characteristics of adults; this may be the case for other aspects of language as well. It should be noted that Lieberman's [1967:104] contention that the tension of the laryngeal muscles remains steady throughout the unmarked breath group in American English has been shown to be incorrect by electromyographic studies, e.g. Hirano et al. [1969].

It might also be possible to speculate that the Psg pattern which most closely "shadows" or reflects the relaxation pressure (and correspondingly the volume of air in the lungs) would be the most natural. This would be a pattern which involves a lesser amount of activity of the expiratory muscles. This speculation involves the equation of less activity (of these muscles) with less effort. The principle of less effort, here involving ease of articulation, is certainly one of the primary principles of language practice and language change. It should be recalled that as the relaxation pressure continuously decreases there must be continually increasing activity of the expiratory muscles in order to maintain the same Psg.

In this section I have suggested a motivation for the unmarked, neutral intonation ending on a low note.[3] I have further speculated very tentatively that the most natural manner of implementing this fall at the end may be by a gradual fall which reflects more closely the decreasing relaxation pressure generated by the passive forces of exhalation.

2. Stages in the Development of Downdrift

I view the development of downdrift as having several stages. The adoption of downdrift of lows only, which I represent LLLLLL, is claimed to be the first stage. At this stage the downdrift of LLLLLL is a function of gradually decreasing Psg. In (3) are represented two patterns of Psg. (3a) might represent a prototypical downdrift pattern, while (3b) would represent a system with an extremely sharp downglide on the final syllable. Under my physiological interpretation, (3b) would reflect a relaxing of the muscles of exhalation only during the final syllable(s).

(3) a.  b. 

[3] Bolinger [1964] suggests that this final low corresponds to the relaxation part of a basic tension-relaxation cycle characteristic of the entire organism. The speaker tenses when he starts speaking and relaxes when he is finished (for example, after a statement as opposed to a question).

Of course, any number of intermediate stages could exist. Stage I of downdrift is a system where LLLLLL sequences exhibit a fundamental frequency pattern (corresponding to Psg) between (3a) and (3b), and where highs (in HLHLHL and HHHHHH sequences) do not exhibit downdrift.

The association of low tone with the realization of the intonational curve involves the implicit assumption that in some sense, in such a Stage I downdrift system, the low tone is the normal or neutral tone, and in languages with just an opposition between high and low, high tone represents a movement away from the normal or neutral tone. Thus I am suggesting that the reasons that lows may exhibit downdrift first is that speakers of two-tone languages may "concentrate" only on the highs and the actual pitch of the low tone, which is regarded as the absence of high tone, is of less importance. This is probably the case in many languages, but definitely not in all languages. Examples of languages where this is not the case might be the Dschang dialect of Bamileke and Nandi. As argued by Hombert [1974:176-178] Dschang does not exhibit downdrift because the presence of a downstepped low blocks downdrift and thus potential perceptual ambiguity is avoided. Creider [1978] suggests a similar motivation for the absence of downdrift in Nandi, which has a phonemic low-falling tone. I agree with Hombert's and Creider's interpretations. In Dschang, for example, the low tone would not be regarded as neutral, but would be equal to a certain percentage of a speaker's "comfortable"[4] pitch range; for a given speaker it would be equal to X cycles per second (cps). Similarly, for a given speaker other level tones would be regarded as equal to Y, Z ... cps, while if contour tones existed they might be regarded as equal to a change of E cps to F cps. In other words the tones have acoustic (or more accurately perceptual) targets, and it is a matter of whatever laryngeal tension is necessary to reach this target.

Reviewing, Stage I of downdrift is when the lows exhibit a fundamental frequency pattern (coincident with Psg pattern) between (3a), prototypical downdrift, and (3b), very abrupt downglide. A connection between

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[4] This is an obvious simplification of the "normalization" problem with respect to fundamental frequency, but this question cannot be dealt with here.

downgliding and downdrift (referred to as automatic downstep[5]) has been proposed earlier by Stewart [1971]. He regarded these both as cases of "key lowering". Stewart states:

> "Generally, then, key lowering can be considered to occur at the end of every low tone syllable which is not followed by another low tone syllable; where it is non-final it is manifested as lowering of the pitch of all the subsequent high tones, and where it is final it is manifested as a slight fall towards the end of the final syllable." [1971:185]

In a footnote, Stewart suggests a causal relation between these two phenomena:

> "There is a case for taking downglide to be the more basic of the two manifestations since, if we postulate it in both contexts in sub-surface phonology, we can plausibly treat the other manifestation, namely downstep, as secondary to it; we can say that in a HLH sequence the pitch interval which separates the end of the L from the following H is the same as that which separates the beginning of the L from the preceding H, but that the following H has a lower pitch than the preceding H as the LH interval starts from the bottom of the downglide at the end of the L. The fact that in surface phonology there is no downglide in this context can be covered by a surface rule deleting downglide in non-final position." [1971:185]

Several comments must be made about this interpretation. According to Stewart's account the lows in a sequence HLHLHL would exhibit an equal amount of downdrift as would the highs in this sequence, since they would

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[5] Stewart [1971] claims that non-automatic downstep can only arise from a system with automatic downstepping (in our terms downdrifting). In other words he always sees the development of non-automatic downstepping as the phonemicization of a previously predictable lower realization of a high after a low, as a result of loss of the low, i.e. /HLH/ [HL'H] → /H'H/ [H'H] vs. /HH/ [HH] unchanged. Although I would admit that this type of development—predictable feature becoming distinctive as a result of a neutralization—is certainly a common one, it is not the only pattern. Consider, for example, a compensatory lengthening diachronic process, e.g. $VC\{^{V}_{C}\} \rightarrow \bar{V}C$, where it is only the gradual loss itself which results in the lengthening (and not any previously existing length being phonemicized when a segment is lost). It certainly seems reasonable that such a "compensatory" development (a displacing of the contrast) could result in non-automatic downstep arising from a system without automatic downstep. As the syllabic carrying the low tone is lost, its drop in laryngeal tension is in a sense taken on by the following high tone; in this manner pertinent distinctions can be maintained.

always begin a given number of cps below the preceding high. This is not the case. It is well-known, e.g. Hyman & Schuh [1974:85], Hombert [1974: 175], that lows in a sequence HLHLHL downdrift slower than the highs in such a sequence. For Stewart the downdrifting (automatic downstepping in his terms) of highs is a function of the non-surfacing downglide of non-final lows, and the lower pitch of subsequent lows is a function of the lower level of the intervening highs. Thus the lower pitch of subsequent lows in HLHLHL sequences is not in any way connected with the downdrift of sequences of lows, which would presumably have to be considered a different, disassociated phenomenon.

Under my interpretation downdrift in a sequence HLHLHL, which I will refer to as Stage II of downdrift could only develop from a system which exhibited downdrift of lows (Stage I). As argued by Hombert, this change may be blocked if it could lead to potential perceptual confusion, for example between a downdrifted high and a mid. The change of Stage I to Stage II amounts to the highs in a sense coming to ride on the intonational curve which is the level of the downdrifting lows. High tone ceases to be equal to a given percentage of a speaker's range and for an individual speaker to a fixed number of cps, as it was at Stage I; instead the fundamental frequency of high tones varies and is "relative" to that of the low pitch. It may be useful to think of high tone after low as a fixed target amount of increase in laryngeal tension. Once this has occurred, once the high tone has been disassociated from an absolute pitch for a given speaker, it is more free to be affected by the pressures of ease of articulation and the principle of least effort. As noted above, in languages with downdrift of both low and highs in a sequence HLHLHL, the highs downdrift faster than the lows in such a sequence. In this case the less effort and ease of articulation is reflected in the lesser amount of rise from low to high. It has been shown, for example by Ohala and Ewan [1972] and Sundberg [1973], that the sequence LH takes longer to produce than an HL sequence (at least in untrained singers). The lowering of a high after a low thus will make this change easier in that it will

require a shorter time.[6] Alternatively it may be suggested that once high tone ceases being perceptually defined and acquires an articulatory target,[7] i.e. a fixed amount of increase in laryngeal tension, it may not make it all the way to this target (a coarticulation effect). It is important to note that it is being suggested here that this natural assimilation of the level of a high to a preceding low is generally inhibited in non-downdrifting languages, like Dschang, or in Stage I dnwndrifting languages because the level of a high tone in such languages is fixed at an absolute pitch for a given speaker (and for the speech community at a fixed percentage of the speaker's "comfortable" pitch range). It is only once the target is disassociated from this fixed, absolute pitch level that the natural articulatorily motivated process can become manifested more freely. As an example of a language with such a system Hombert offers Igbo, where successive lows and high alternating with lows (HLHLHL) exhibit downdrift but sequences of highs do not.

The change of a Stage II system to a Stage III system, where sequences of highs also downdrift, amounts to the establishment of a situation where all tones downdrift. Recall how in the Stage I system it was suggested that the lows were tied to, or carried by, the intonational curve. In a Stage III language all the tones are tied to this curve. This would be similar to the situation outlined by Lea [1973; 1977] for English, whereby pitch perturbations, which in English are a function of the stress of various syllables and for a Stage III downdrift language would be a function of the tones of the syllables, are superimposed upon a sentence intonation

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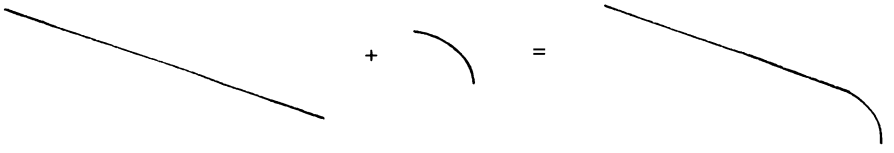
[6] As suggested by Hombert [1974:175], the low may possibly also be raised somewhat before a high to the same end.

[7] It should be obvious that I am claiming that in certain languages tonal features are defined in perceptual terms while in other languages they are defined in articulatory terms. My position is that any aspect or parameter of which a speaker-hearer/language-learner may be cognizant can be a potential feature, and the same "sound" can be classified, i.e. defined in terms of features, differently by (speaker-hearers of) different languages (and conceivably by speaker-hearers of the same language, especially during language acquisition).

line. One might say that in a Stage III language low tone would be associated with a certain (normal) laryngeal tension, while high tone would be associated with a certain greater (than for low) laryngeal tension; both would downdrift due to the gradually falling intonational curve, which is a function of Psg. An example of a language with a Stage III downdrift system would be Hausa, where LLLLLL, HLHLHL, and HHHHHH sequences, i.e. TTTTTT or any tone, all downdrift.

Before concluding, it should be noted that from a Stage III downdrift system where the downdrift reflects a superimposition of the tones of the syllables (in physiological terms, of certain fixed target amounts of laryngeal tension) onto the intonational pattern of the utterance (being a function of Psg), might conceivably develop a system where the gradually falling pitch of sequences of tones was dissociated from the intonation curve. In other words, the gradual fall in pitch would be no longer a function of a gradually falling Psg, but would be programmed through laryngeal tension. This development might be appropriately termed the "deintonationalization" of downdrift. From Odden's study of tone in the Karanga dialect of Shona (personal communication, 1978), it appears that such a "deintonationalization" of downdrift may have occurred there. In Karanga there appear to be two types of falling realizations of sequences of lows: one more gradual, starting from the beginning of the utterance, and a second more abrupt, occurring only at the end of the utterance when it bears a neutral intonation. This might be represented as in (4).

(4) 


The more abrupt drop looks very much like the result of a sharply falling Psg resulting from a late relaxation of the muscles of exhalation. The more gradual fall occurs not only under the unmarked intonation, but also under the marked intonation, for example as is found in conditional clauses.

## 3. Conclusion and Implications

Summarizing, it has been suggested that the development of downdrift is best viewed as taking place in stages. Each of the stages may be blocked, as pointed out by Hombert [1974], if potential perceptual confusion is threatened. The three stages are of lows only (LLLLLL), of highs only when separated by lows, i.e. only when after a low (HLHLHL), and of sequences of highs (HHHHHH). No positive evidence for the proposal that downdrift develops in stages, perhaps of the type as might be provided from the situations in neighboring dialects, has been offered; however, this proposed course of development does predict the following implicational hierarchy of the sequences which will exhibit downdrift:

(5) LLLLLL → HLHLHL → HHHHHH

Given that x → y, if a language has downdrift of sequence y, it is predicted that it will also have downdrift of sequence x. To the extent that this hierarchy is consistent with the facts, the proposed development is supported.

Notice that this hierarchy predicts that no languages will exhibit downdrift of HLHLHL and/or HHHHHH, but not of LLLLLL. Now look again at (1) from Hombert [1974]. Notice that three types of languages are not attested. These are systems with downdrift of HLHLHL and/or HHHHHH, but without downdrift of LLLLLL. It is, of course, possible that the non-attestation of such languages is the result of the small sample of languages listed by Hombert. The development proposed above, however, accounts for these cases of non-attestation and predicts that in a larger sampling languages with these characteristics will not be found.

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# VOWEL HARMONY IN IGBO AND DIOLA-FOGNY*

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Although both Igbo and Diola-Fogny have vowel harmony systems in which the harmonic feature is [Advanced Tongue Root], superficially they are very different. Aoki [1968] suggests that Igbo vowel harmony is similar to vowel harmony in Uralic and Altaic languages such as Finnish and Hungarian whereas Diola-Fogny has a dominant-recessive system like that found in Nez-Perce. However, analysis of vowel harmony in Igbo and Diola-Fogny reveals that these two languages actually have identical vowel harmony rules; the superficial differences result from a different distribution of [+ATR] vowels in the two languages.

## 1. Types of Vowel Harmony

Vowel harmony in the Niger-Congo languages of Igbo (a Kwa language spoken in Nigeria) and Diola-Fogny (a West Atlantic language spoken in Senegal) differs from vowel harmony in Uralic and Altaic languages such as Finnish and Turkish in two respects: first, the harmonizing feature is [Advanced Tongue Root] (ATR)[1] rather than [back] (and [round]) and second, prefixes as well as suffixes alternate. In addition, these two distantly related languages differ from each other in that Diola-Fogny

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[1]Ladefoged [1964] has shown that the phonetic basis of the distinction between the alternating vowels in Igbo is relative advancing of the tongue root. This distinction has usually been labelled tense/lax. For further discussion of [ATR] see Halle and Stevens [1969], Stewart [1967], and Lindau et al. [1972].

*roots* as well as affixes alternate, whereas in Igbo, as in the Uralic and Altaic languages, roots do not alternate.

Aoki [1968] suggests that *symmetry* is a relevant criterion for classifying vowel harmony systems; according to his classification Igbo is a *symmetric* system, whereas Diola-Fogny is an *asymmetric* system.

> "In a *symmetric* system, any vowel in a certain position can determine the series of vowels for the word. Examples are Finnish, Hungarian, Altaic languages, Twi, and Igbo. On the other hand, an *asymmetric* system has one series dominating the other. In such systems, the presence of a dominant vowel in a word changes the vowels of the non-dominant series." [Aoki 1968:143]

In this paper it will be shown that despite the superficial differences of the Igbo and Diola-Fogny vowel harmony systems, these languages actually have identical vowel harmony rules and that the superficial differences result from differences in the distribution of vowels in the underlying forms of the two languages.

## 2. Igbo Vowel Harmony

The vowels of Igbo can be divided into two harmonic sets; there are no neutral vowels:

(1)

| [+ATR] | [-ATR] |
|---|---|
| i | ị [ɪ] |
| u | ụ [ʊ] |
| e | a |
| o | ọ [ɔ] |

[+ATR] vowels are produced with an advancing of the tongue root which causes an increase in the width of the pharynx whereas [-ATR] vowels are produced without any advancing of the tongue root. [+ATR] vowels and [-ATR] vowels do not generally co-occur in the same word except in loanwords and compounds. The harmonic quality of the vowel or vowels of the root determines the harmonic quality of affix vowels as illustrated by the following examples (roots are enclosed in []):

(2) a. a - [zụ́]-ɪa[2] 'don't buy' (p. 25)
a - [tà]-ɪà 'don't eat' (p. 1)
e - [kè]-ɪè 'don't share' (p. 25)

b. ị - [ɪụ́] 'to marry' ọ̀ - [ɪû] 'marrier'
ị - [tá] 'to eat' ọ̀ - [ta] 'eater'
ị - [vú] 'to carry' ò - [vu] 'carrier'
(all p. 27)

All verb roots are monosyllabic and thus we cannot speak of root harmony for verbs. Nouns, on the other hand, are not so restricted. Many polysyllabic noun roots occur, for example:

(3) anụ 'animal meat' osisi 'tree'
ụlọ̀ 'house' òke 'rat'
akwụkwọ 'leaf, paper'

Clearly, since both prefixes and suffixes assimilate to the harmonic quality of the root vowels, two vowel harmony rules will be necessary to account for Igbo vowel harmony; one to assimilate prefix vowels to the following root vowels, and one to assimilate suffix vowels to the preceding root vowels. Thus, we might postulate the following two rules (which could be collapsed by a convention such as Bach's [1968] neighborhood convention):

(4) a. $V \rightarrow [\alpha ATR] \; / \; \underline{\quad} C_0 \; V_{[\alpha ATR]}$

b. $V \rightarrow [\alpha ATR] \; / \; V_{[\alpha ATR]} \; C_0 \underline{\quad}$

Assuming for the moment that all non-initial root vowels and all affix vowels are unspecified for the feature [ATR], these two rules would be adequate to account for both root and affix harmony in the forms considered so far. However, when additional data are considered, these rules

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[2] V̀ = low tone, V́ = downstepped high tone, V̂ = high-low glide, and V (unmarked) = high tone. Unless otherwise indicated, forms cited are taken from Green and Igwe [1963] and page numbers refer to that source.

are seen to be inadequate. The crucial data involve words containing non-alternating suffixes.

Although all prefixes harmonize, there are a number of suffixes which do not. For example, the partitive suffix -tụ the distributive suffix -sị[3] and the emphatic suffix -dị do not harmonize (non-alternating suffixes are indicated by °):

(5) a. non-alternating suffixes

| | |
|---|---|
| partitive | -tụ |
| distributive | -sị |
| emphatic | -dị |

b. [nyè]-tụ° m̀ nnu 'give me a little salt' (p. 62)

c. [rí]-tụ° 'eat something' (p. 85)

d. [vù]-sị̀° 'carry' (distributive) (p. 90)

Thus, although the partitive suffix in (5c) follows a [+ATR] vowel in the same word, it does not become [+ATR]. The vowel of such a suffix must apparently be specified lexically as [-ATR] and marked with an exception feature ([-Vowel Harmony]) to prevent vowel harmony from applying to it. Thus, the underlying representation of rí-tụ would be /rí-t ụ/. But applying
[-VH]
the rules in (4) to this form yields incorrect results because although the vowel of the suffix will not undergo harmony, there is nothing to prevent the vowel of this non-alternating suffix from causing the *root* vowel to become [-ATR] as illustrated by the derivation in (6).

(6) /rí-t ụ/
[-VH]

(4a)

↓

*rị-tụ

Furthermore, it is not possible to claim that non-harmonizing suffixes such as -tụ do not *condition* harmony, since such suffixes do determine the

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[3] Individuals vary; for some -sị does harmonize, for others it does not.

harmonic quality of a following vowel, as illustrated by the examples in (7):

(7) a. abọ anyị ḛ -[bho] -sị̄° -ghị hâ
basket we pref put load on head distr emphatic them
'our not helping them to put the baskets on their heads' (p. 137)

b. abọ m̄ [bho] -wḛ -ghi Ekwê
basket I put load on head begin emphatic
'my not beginning to help Ekwe put the basket on his head' (p. 137)

(Negation in these examples is marked by a tone pattern distinct from that of the affirmative.) Here, the regularly alternating "emphatic" suffix ghi/ghị has a [-ATR] vowel following the non-alternating suffix -sị but a [+ATR] vowel following the suffix -we which has a [+ATR] vowel.

It might be suggested, in light of these data, that the vowel harmony rules must be restricted to apply only to *affix* vowels; that is, that vowel harmony be reformulated as follows:[4]

(8) a. $\overset{V}{[+\text{affix}]} \rightarrow [\alpha\text{ATR}] \;/\; [\alpha\text{ATR}]\; C_o$ ___

b. $\overset{V}{[+\text{affix}]} \rightarrow [\alpha\text{ATR}] \;/$ ___ $C_o\; [\alpha\text{ATR}]$

However, consideration of additional data shows that this analysis is also inadequate. Consider the following form:

(9) (mà ha̰) e-[vṵ]-te-sị°-ghị (abọ) '(if they) don't bring (the baskets)' (p. 129)

Since the non-harmonizing suffix -sị does not cause a preceding suffix (te 'motion toward') to become [-ATR], rule (8b) must apparently be ordered before (8a). Specifically, the underlying representation of e-vṵ-te-sị-ghị would be /E-vu-tE-sị°-ghI/ (where capital letters indi-

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[4]Another possibility would be that all disharmonic suffixes are marked as not conditioning (8b), i.e. all non-alternating suffixes are exceptional in that they do not undergo harmony *and* that they do not condition regressive harmony, although they do condition progressive harmony regularly. This proposal can be immediately eliminated. It is totally ad hoc and leaves unexplained and unexplainable why *all* and *only* those suffixes which are exceptions to Vowel Harmony are also exceptional in that they do not condition the sub-rule (8b) of Vowel Harmony.

cate segments unspecified for the feature [ATR]). Although both vowel harmony rules are applicable to E in -ŧE , (8a), but not (8b), makes the correct prediction. In this case the correct output can be obtained by extrinsically ordering (8b) before (8a) as illustrated in (10):

(10) /E + vu + ŧE + si̱° + ghI/
(8b) e + vu + ŧa + si̱° + ghI
(8a) e + vu + ŧe + si̱° + ghi̱

However, Clements [1974] has shown that the rules in (8) will not work for Igbo in general. According to Clements, the suffix -ghị does not alternate in a closely related dialect of Igbo.[5] The form in (11a) shows that the vowel harmony rules cannot apply in the order (8a) before (8b) in this dialect either [Abraham 1967:87]:

(11) a. m̀ - [gbujị̀] - rị - ghị° oshishi[6] 'I did not cut down the tree for myself'
b. *m̀ - gbujị̀ - rị - ghị

or we will derive *m̀gbuji-rị-ghị because (8b) will assimilate the vowel of the suffix -rị to the following [-ATR] suffix vowel. Although the order (8b) before (8a) will also correctly derive forms such as the one in (11), this order will not work in other cases. In the dialect described by Abraham, the inseparable proforms ị/ị 'you', o/ọ 'he' optionally harmonize with a vowel to the right, provided that the vowel is also a prefix vowel. Thus we have (Abraham, 1967:40,46):

(12) ị - gè - è - [shị] 'you'll cook'
ị - gè - è - [shị] 'you'll cook'
you fut pref cook
pref

If the rules are applied in the order (8b), (8a) as required to derive the

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[5]The dialect of Igbo we have been considering is the Ọhụhụ dialect.

[6]The verb gbuji is a compound made up of the two monosyllabic verb roots gbu 'cut' and ji 'snap off'. See Lord [1975] for a discussion of verb compounds in Igbo.

form in (11), then the incorrect derivation in (13) cannot be avoided:

(13) /i̤ + gE + E + shi/
(8b)
↓
i̤ + gE + e + shi
(8b)
↓
i̤ + ge + e + shi
(8a)
↓
i̤ + ga + e + shi
(8a)
↓
*ị + ga + a + shi

Thus, the rules (8a) and (8b) are inadequate for at least one Igbo dialect.

Clements goes further, however, suggesting that the preceding argument demonstrates not only that the rules in (8) are inadequate, but also that Igbo vowel harmony cannot be accounted for by any iterative rule of segmental phonology. But, of course, to show that the iterative rules in (8) are inadequate is not to show that there is *no* analysis involving iterative rules which *is* adequate. In fact, Igbo vowel harmony can be accounted for by the iterative rules in (14) if it is assumed that in roots with [+ATR] vowels, the first vowel is specified as [+ATR] and all other vowels are specified [-ATR].

(14) Igbo Vowel Harmony

a. $V \rightarrow [+ATR] / \underset{[+ATR]}{V} \ C_0 \ \_\_\_$

b. $V \rightarrow [+ATR] / \_\_\_ C_0 \ \underset{[+ATR]}{V}$

Note that the rules in (14) are asymmetric in the sense that only [+ATR] vowels condition harmony.

The application of the proposed rules is illustrated in (15); the order of application of the subrules is not crucial.

(15) / a + ke + la / 'don't share' / a + zụ + la / 'don't buy' (cf.(2a))
(14b) (14a) (no rules applicable)
↓ ↓
e + ke + le a + zụ + la

Consider now the derivation of e-vu-te-sị-gh̵ị (see (9)). The underlying representation of this form is / a-vu-ta -sị-ghị / , and -sị is

marked [-Vowel Harmony]. Since the [-ATR] vowels do not condition vowel harmony, the rules of (14) will derive the correct output, as illustrated in (16):

(16)

| / a + vu + ta + si + ghị / | | / a + vu + ta + si + ghị / | |
|---|---|---|---|
| (14a) | a + vu + te + si + ghị | (14b) | e + vu + ta + si + ghị |
| (14b) | e + vu + te + si + ghị | (14a) | e + vu + te + si + ghị |

Furthermore, these rules will correctly derive the forms in the dialect discussed by Clements. Consider first the form m-[gbujị]-ri-ghị (where ghị is exceptional in that it does not alternate cf. (11a)). The derivation of this form is illustrated in (17).

(17)

| / m + gbuji + ri + ghị / | | / m + gbuji + ri + ghi / | |
|---|---|---|---|
| (14a) | m + gbuji + ri + ghị | (14b) | not applicable |
| (14b) | not applicable | (14a) | m + gbuji + ri + ghi |

Now consider the forms i-ge-e-[shi] , ị-ge-e-[shi] (cf. 12). As can be easily determined, only permissible surface forms can be derived by rules in (14) regardless of the order in which they are applied to the underlying form / i-ga-a -shi / (assuming the proform i is somehow marked to optionally undergo (14)).

Notice that the analysis proposed here would be easily falsifiable: it depends crucially on the claim that all affix vowels in Igbo are underlyingly [-ATR], since an underlying [+ATR] suffix vowel would cause a preceding *root* to have [+ATR] vowels. Thus, all that is necessary to show that this analysis is incorrect is one clear case of a *non-alternating* suffix with a [+ATR] vowel since such a suffix would have to be analyzed as having an underlying [+ATR] vowel. To my knowledge there are no such cases.[7]

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[7] Green and Igwe classify the non-alternating forms -bè 'yet, ever' -mò 'lest', which have [+ATR] vowels, as *suffixes*. The basis for this classification is as follows:

> "[There is] difficulty ... finding any clear formal distinction between compound verbs (verb plus verb) and verb plus suffix... One of

We turn now to consider the vowel harmony system of Diola-Fogny, which is quite different (superficially, at least) from Igbo.

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> the characteristics of compound verbs, however, is absence of vowel harmony between the vowels of the two stems ... When, therefore, we find a compounding element in which ... the vowel of this element does not harmonize with the vowel of the stem it follows, we have to see whether, on semantic grounds, it can be associated with any verb. If it can, we tentatively classify it as a verb, if not, as a suffix." [Green and Igwe, 1963:53]

Presumably, Green and Igwe classify these forms as suffixes because they cannot be associated with any free verb on semantic grounds. If this classification is correct, then these forms are counter-examples to the claim that all non-alternating suffixes have [-ATR] vowels. There are, however, a number of reasons for believing that their classification is incorrect, and that bè and mò are not suffixes, but rather compounding elements. First, bè and mò always follow verb roots. For example, the non-alternating suffix -sị occurs not only after verb roots (see (7c)) but also after the suffix -te (see (9)); -te must be a suffix because it alternates. But the fact that -bè and -mò never do follow suffixes suggests that they form compounds with the preceding verbs. The fact that these forms do not alternate can then be explained in the same way as the non-alternation of the second member of a compound is explained, that is, by a preceding word boundary which blocks the application of vowel harmony.

Additional evidence that -bè and -mò are not true suffixes is their tonal behavior. Almost all suffixes have high tone, whereas -bè and -mò have *low* tone. Green and Igwe [1963:62-64] list five such low tone suffixes (three with [-ATR] vowels, -bè and -mò) none of these low tone suffixes alternate. Green and Igwe state:

> "There are a few low tone suffixes with somewhat restricted distribution, whose tonal behavior, so far as has been observed, is *the same as that of the second member of a compound verb* when that member, by itself, is a low tone verb." (Green and Igwe [1963:53]; emphasis added, COR)

Finally, Welmers [1970] discusses similar bound morphemes which he calls *base formatives*. These form compound like verb bases but do not occur as independent verbs. One of his examples is -hyè, indicating action done in a wrong way or by mistake (-gáhyè 'go in the wrong way' (obj. 'road') -gá 'go'). Welmers notes that about thirty such base formatives have been identified in Igbo. Thus bè and -mò are not unique and should, apparently, be considered base formatives which, like true verb roots in a compound, neither undergo vowel harmony nor condition harmony in the other member of the compound (cf. the compound -gáfè 'go across' ← -gá 'go' + -fè 'cross, pass over' [Welmers 1970:54].

3. Diola-Fogny Vowel Harmony

The Diola-Fogny vowels can be divided into two harmonic sets; there are no neutral vowels:

(18)

| [+ATR] | [-ATR] |
|---|---|
| i | ɪ |
| e | ɛ |
| ə | a |
| o | ɔ |
| u | ʊ |

Morphemes in Diola-Fogny fall into one of two classes: alternating and non-alternating. Non-alternating morphemes have [+ATR] vowels (these are the dominant vowels), whereas alternating morphemes have two alternates, one with [+ATR] vowels and one with [-ATR] vowels. When a non-alternating morpheme occurs in a word with an alternating morpheme, the alternating morpheme has [+ATR] vowels. When a word is made up only of alternating morphemes, then all the vowels are [-ATR] (these are the non-dominant or recessive vowels). For example, the root for the verb 'to have', baj/bəj , alternates; it has a [-ATR] vowel when occurring alone or with other alternating morphemes, but has a [+ATR] vowel when occurring with the non-alternating suffix -ul . This is clearly illustrated by the examples in (19):[8]

(19) (baj/bəj 'have', jitum 'lead away', -ɛn/en 'causative', nɪ/ni- 'I', -ʊ/u 'you' (pl. objective, -ul 'towards the speaker'))

| | | | | | |
|---|---|---|---|---|---|
| a. | [baj] | 'have' | f. | [jitum] | 'lead away' |
| b. | [baj]-ɛn | 'cause to have' | g. | [jitum]-en | 'cause to lead away' |
| c. | nɪ-[baj]-ɛn-ʊ | 'I have caused you to have' | h. | ni-[jitum]-en-u | 'I have caused you to be led away' |
| d. | [bəj]-ul | 'have from' | i. | [jitum]-ul | 'bring' |
| e. | ni-[bəj]-ul-u | 'I have from you' | j. | ni-[jitum]-ul-u | 'I brought you' |

[8]All Diola-Fogny data are from Sapir [1965].

This system is clearly very different from Igbo, for here roots as well as affixes alternate. Yet the very same rules which were needed to account for Igbo vowel harmony will account for this system as well. The rules are repeated here for convenience in (20) and sample derivations are given in (21).

(20) Diola Fogny Vowel Harmony[9]

a. $V \rightarrow [+ATR] / \underset{[+ATR]}{V} \; C_o \; \_\_$

b. $V \rightarrow [+ATR] / \_\_ C_o \; \underset{[+ATR]}{V}$

(21)

| | /nɪ + baj + ɛn + ɔ//baj + ul/ | | /nɪ + baj + ul + ɔ/ |
|---|---|---|---|
| | | | ↓ |
| 20a | --- | --- | nɪ + baj + ul + u |
| | | ↓ | ↓ |
| 20b | --- | bəj + ul | nɪ + bəj + ul + u |
| | | | ↓ |
| 20b | | | ni + bəj + ul + u |

Thus, the only difference between Diola-Fogny and Igbo vowel harmony is that Diola-Fogny, but not Igbo, has affixes as well as roots with underlying [+ATR] vowels. For example, the Diola-Fogny suffix -ul has an underlying [+ATR] vowel.

## 4. Summary

Superficially, Diola-Fogny and Igbo have very different vowel harmony systems. According to Aoki's classification, vowel harmony in Igbo and the Uralic and Altaic languages, e.g. Turkish, is *symmetric*, whereas vowel harmony in Diola-Fogny is *asymmetric*. Nevertheless, closer examination of vowel harmony in Igbo and Diola-Fogny reveals that this classification is inadequate. First, Igbo and Diola-Fogny actually have identical vowel harmony rules; the superficial differences are a result of the different distribution of [+ATR] vowels in the two languages. In particular, Diola-Fogny, but not Igbo, has underlying affixes with [+ATR] vowels. Second,

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[9]Essentially this formulation of Diola-Fogny vowel harmony is proposed by Lightner [1972]. Hall et al. [1974] have shown that this same vowel harmony rule is shared by several Nilotic languages.

the vowel harmony system of Igbo should not be classified with the Uralic and Altaic vowel harmony systems as Aoki suggests. Specifically, in languages such as Finnish, Turkish, and Hungarian, vowel harmony rules are *alpha* (or, following Aoki's terminology, *symmetric*) rules whereas in Igbo, vowel harmony is a *non-alpha* (or *asymmetric*) rule. For example, Turkish vowel harmony can be described as in (22),[10] whereas Igbo (and Diola-Fogny) vowel harmony is described by (23):

(22) Turkish Vowel Harmony [Lightner 1972]

$$V \rightarrow [\alpha back] \; / \; \underset{[\alpha back]}{V} \; C_o \; \_\_$$

(23) Igbo and Diola Fogny Vowel Harmony (mirror image)

$$V \rightarrow [+ATR] \; / \; \underset{[+ATR]}{V} \; C_o \; \_\_$$

[10] Turkish also has roundness harmony for high vowels. It might appear that the Igbo and Diola-Fogny vowel harmony rules differ from Uralic and Altaic rules in another respect. The latter are bidirectional or mirror image rules whereas the former are not. However, the apparent unidirectional nature of Uralic and Altaic vowel harmony rules is probably a result of the paucity of prefixes in these languages. Indeed, under certain circumstances, vowel harmony in Finnish and Turkish, at least, applies right-to-left as well as left-to-right. See Skousen [1975] for a discussion of Finnish examples.

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# THE NATURAL HISTORY OF MEINHOF'S LAW IN BANTU

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The paper presents a historical reconstruction of Meinhof's Law in terms of two functionally distinct stages of development. It is argued that in the first stage, the Law developed as a phonetic process involving assimilation internal to a voiced, prenasalized stop. This assimilation was restricted to environments in which a second prenasalized segment occurred in the succeeding syllable; however, this part of the environment functioned as a catalyst, and not an active cause of the change. In the proposed second stage of development of Meinhof's Law, the environment of the Law generalized from "following prenasalized segment" to "any following nasal segment." It is argued that this development was a consequence of a historical restructuring involved in the shift from a phonetic process to a morphophonemic rule.

## 1. Introduction

Much of the interest in recent historical reconstruction has been focused on finding functional motivations for the sound changes that have been observed in various languages. In this paper, I propose to apply the principles of Stampe's [1973] theory of Natural Phonology in providing a functional explanation for the development of the sound change known as Meinhof's Law in Bantu. The key feature of Stampe's theory which figures in the analysis is the distinction between the innate and automatic phonetic *processes* of a language, and the morphophonemic *rules* which are learned in association with specific morphemes. In this paper, I apply the rule/process distinction to a historical interpretation of the different attested forms of Meinhof's Law in Bantu phonology. Specifically, I argue that Meinhof's Law developed in two stages. In the first stage, the Law operated as an assimilatory reduction process affecting voiced, prenasalized consonants, with the environmental condition, "before a prenasalized consonant in the following syllable" acting as a catalyst for the application of the process. In the second stage of development (affecting some

but not all of the languages evidencing Meinhof's Law), the environment of the Law generalized from "a following prenasalized consonant" to "*any* following nasal." This change took place because speakers had come to interpret the "hyper-nasality" of certain forms affected by the Law as a redundant category signal, and extended this redundancy to other forms containing nasal consonants. Thus, the main idea I wish to defend is that the effects of inert phonetic processes (which constitute the regular sound changes of a language) are learned by new generations of speakers as morphophonemic alternations affecting particular morphological categories. When a process changes in this way to a rule, it may undergo restructuring which ignores the phonetic basis for the alternation, but is sensitive to functional motivations related to paradigm structure.

A similar approach to the question of sound change has been previously presented in Hooper [1974]. Hooper argues on the basis of data from various Spanish dialects that early morphologization of phonetic processes is a natural development in historical change. For example, she demonstrates that in Granadense (the dialect of Granada, in the eastern half of Andalucia) an alternation in vowel tenseness which was originally motivated by a word-final /s/ (weakened to [h]) took on morphological significance as a marker of the noun category "plural", even before the phonetic motivation for the alternation had been completely lost in the language (through loss of word-final [h]).

## 2. Meinhof's Law, Stage One: The Phonetic Basis

Meinhof's Law is attested in several different forms in the Bantu languages.[1] The effect of the Law is to change a voiced, prenasalized consonant ([$^{m}$b], [$^{n}$d], [$^{\tilde{n}}$j], [$^{ŋ}$g]) to a long nasal (or in some languages, a simple nasal), when followed in the next syllable by another prenasalized consonant (in some languages, any following nasal C). The three major at-

[1]For a broader survey of the data related to Meinhof's Law, and a review of the literature on this topic, see Herbert [1977].

tested forms of the Law are summarized in Table I below,[2] with representative examples from Ganda, Kikuyu and Swahili, respectively.

Table 1: Attested Forms of Meinhof's Law

1. $^{n}C_{vd} > N: / \_\_ V (V) N$

2. $^{n}C_{vd} > N / \_\_ V (V) N$

3. $^{n}C_{vd} > N / \_\_ V (V) {}^{n}C$

Examples:

| | | | | |
|---|---|---|---|---|
| Common Bantu | *N-gombe | *N-jumba† | *N-goma | *N-dimi |
| | 'cattle' | 'house' | 'drum' | 'tongues' |
| Ganda | ŋŋombe | nnyumba | ŋŋoma | nnimi |
| Kikuyu | ng'ombe†† | nyūmba | --- | nĪmĪ |
| Swahili | ng'ombe | nyumba | ngoma | ndimi |

†I have followed a suggestion in Meeussen [1972:9-10] in rejecting a *j/*y contrast for Proto-Bantu. This is the only starred form which deviates from Guthrie.

††orthographic ng' = [ŋ]

From evidence presented in Meeussen [1962], and discussed more recently in Herbert [1977], it appears that Meinhof's Law is a very old development, which may have been active as a phonetically motivated sound change as early as the Proto-Bantu period. The evidence for this supposition includes (a) the fact that the Law is attested in almost all of the Bantu field, although often only in relic form, and (b) the fact that it is no longer a productive rule in any form in any language; for example, it does not apply to loan-words in Ganda, one of the languages in which the Law is still apparent in morphophonemic alternations. A third consideration is

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[2]Another apparent variation in the form of the Law is that in some languages, it affects only prenasalized consonants of a certain position, e.g. velars. See Meeussen [1962] for some discussion. This variation does not affect the points to be made in this paper.

the fact that the Law is post-dated by various other historical developments. For example, in Kikuyu, prenasalized voiceless stops have developed into voiced stops, in forms such as ndumbĪ 'piece of log; wooden head rest', from Proto-Bantu *-tụmbi (7/8) 'stool'. (Starred forms are from Guthrie [1967-71]; data from Kikuyu and other Bantu languages is given in orthographic form, which provides an adequate representation of the Bantu consonants.) If the Law had been still productive when the change *nt > nd took place, then the Kikuyu word ndumbĪ would have been subject to it, yielding the unattested **numbĪ. Some examples of a parallel development for prenasalized voiceless consonants in Luyia are indama 'cheek' < *-tama ; and tsimbeni 'lightening' < *-penị. (Luyia otherwise evidences the application of Meinhof's Law before a simple nasal, as in ing'oma 'drum' < *-goma.)[3]

In the earliest discussion of Meinhof's Law, it was considered to be a case of *dissimilation* of consonants in successive syllables (at least, where two prenasalized consonants happened to be involved). I believe, however, that the active phonetic principle behind the Law was in fact a case of *assimilation within* the segment affected. That is, a voiced stop with prenasalization became a nasal consonant by means of a simple assimilation to its "prenasal" component. The resulting long nasal segment subsequently reduced to a simple nasal in all languages other than Ganda (the retention of a long nasal in Ganda was undoubtedly related to the development of geminate consonants from other sources, cf. Mould [1977]). This view of the essential phonetic form of Meinhof's Law (henceforth, to be denoted $ML_1$) may be schematized as follows:

$ML_1$: Meinhof's Law as a phonetic process

$$^{n}C_{vd} \rightarrow N:$$

(Subsequently: N: → N in most languages)

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[3]Even more dramatic evidence in Luyia for loss of productivity is the diminutive form axa-moni 'little eye', from imoni 'eye (< *im-βoni ; based upon -βona 'see'). I am indebted to the anonymous reviewer for pointing out this fact.

The fact that the process represented as $ML_1$ applied only in the case of a prenasalized consonant in the succeeding syllable can be explained on this account as follows. Stampe has argued that phonetic reduction processes, such as $ML_1$, are universally available to children as an aid in mastering the pronunciation of sounds in their respective languages. These processes are gradually "suppressed" in the acquisition of a language, as the child's speech gradually approximates the adult standard. Failure to suppress these processes, on the other hand, leads to historical innovation and sound change. My proposal concerning the historical origin of Meinhof's Law is that it reflects the reduction of a voiced prenasalized stop to a long nasal, a reduction process which was suppressed in every environment *except* the case of two prenasalized stops in successive syllables. In the latter case, the reduction process applied to the first prenasalized segment in the string. Thus, the environmental condition, "when followed by another prenasalized stop", functioned only as a catalyst for the application of $ML_1$ but did not itself constitute the cause of the development. This account of the data seems to me a plausible one, since it is obvious that an inherently difficult segment such as a prenasalized consonant presents considerably greater problems for the language learner when it happens to recur in rapid succession.

A recent alternative proposal concerning the phonetic interpretation of Meinhof's Law has been made in Herbert [1977]. Herbert also views the Law as a case of phonetic assimilation, but of a quite different sort. Herbert claims that at the underlying level of representation, Bantu prenasalized segments are to analyzed as homorganic nasal *clusters*, with the nasal element functioning in the preceding syllable and the stop consonant in the following syllable. Meinhof's Law can then be explained as a case of the spread of the feature [+ nasal] to the only non-nasal segment in an otherwise "hyper-nasal" environment. This interpretation of Meinhof's Law is formalized as follows:

$$\begin{bmatrix}+\text{cons}\\+\text{voice}\\-\text{cont}\end{bmatrix} \rightarrow [+\text{nasal}] \;/\; \begin{bmatrix}+\text{cons}\\+\text{nas}\end{bmatrix} \_\_ \begin{bmatrix}+\text{voc}\\+\text{nas}\end{bmatrix} \quad \begin{bmatrix}+\text{cons}\\+\text{nas}\end{bmatrix}$$

One disadvantage of Herbert's proposal (over my own) is that it requires independent acceptance of the analysis of prenasalized segments as underlying nasal clusters. However, I do not consider this a major difficulty, since Herbert's case is well-argued. A more serious objection is that the analysis depends upon a further assumption concerning vowel nasalization processes, namely, "If a language has a process or processes nasalizing underlying oral vowels and has nasal compounds, any vowel preceding a nasal compound will be systematically nasalized" [Herbert 1977:349]. This generalization is needed to account for the hypothesized nasality of any vowel before a prenasalized consonant in Proto-Bantu (but not necessarily before a simple vowel). In addition, we must assume that Proto-Bantu did possess a phonological process of vowel nasalization, as assumption that Herbert has not supported in any specific detail. My own analysis depends only upon the overt phonetic form of prenasalized consonants in Bantu, plus the general claims of Natural Phonology.

The question of which phonetic analysis of Meinhof's Law is the more persuasive does not affect the argumentation in the next section of this paper. In what follows, I attempt to show that the emergence of a second conditioning environment for Meinhof's Law (namely, "when followed by any nasal segment in the succeeding syllable") was a product of the historical process of morphologization.

## 3. Meinhof's Law, Stage Two: The Evidence for Restructuring

In this section of the paper, I wish to defend the view that those languages in which Meinhof's Law operates in the environment of *any* following nasal consonant (and not just a following prenasalized consonant) represent cases of historical restructuring associated with the change from a process to a rule. This restructuring took place as follows. Meinhof's Law in its first stage tended to affect two morphological constructions: noun stems taking the class 9/10 nominal prefixes, the so-called "nasal classes" of Bantu; and verb stems preceded by the first person, singular subject marker **nɨ-* , which tended to reduce to a homorganic nasal in many languages. My proposal concerning the second stage of Meinhof's Law is that, relative to these specific morphological categories, the Law underwent a restructuring in which the environment of the Law generalized to "any following nasal". The form of Meinhof's Law thus became the rule

given below.

$ML_2$: Meinhof's Law as a morphophonemic rule

$$^{n}C_{vd} \rightarrow N(:)^{*} \; /\_\_\_ V\ (V)\ N$$

*Whether a long or short nasal results depends upon the specific language.

The idea behind this formulation is that the spread of nasality to the voiced stop in this form of the rule reflects the role of the feature [nasal] as a morphological, rather than a phonetic, redundancy.

The best supporting evidence for my analysis is the *absence* of evidence for Meinhof's Law ever having applied in the case of the Bantu verbal extensions *-am- (Stative) and *-an- (Reciprocal). If the environment of Meinhof's Law had been "any following nasal" during the productive, non-morphologized stage of the rule, it should have affected stems ending in a prenasalized consonant followed by *-am- or *-an- . Yet of twenty-two original Bantu stems in Kikuyu, for example, which have the shape ...CVNC..., none of these has an extended form with -an- which has undergone Meinhof's Law. Nevertheless, some of these forms have specialized meanings, which suggests that they are rather old word-formations. Moreover, there are Class 9 nominal derivatives of the same stems which do show the effects of Meinhof's Law (on the nominal prefix). Some examples are presented in Table II. (see p.268)

To the above it might be objected that levelling has perhaps affected extensions with -an- , and that this would account for the absence of evidence for the application of Meinhof's Law. Even so, we would expect to find relic formations where extensions such as *-am- have been incorporated into a root and do show the effects of the Law. Kikuyu does have two candidates for such relic evidence, and again, $ML_2$ has not affected these words. The forms are kingima 'be stupid; stand still' < *-king- (*-kingam-) 'lie across'; and hindima 'be morose' < *-pɨnd- 'remain silent'. These facts contrast with the present status of Dahl's Law in Kikuyu, as described in Bennett [1967]. Dahl's Law is another apparent case of consonant dissimilation in Kikuyu, since its effect is to change

Table 2: Extended Verbs With -an- in Kikuyu

| | |
|---|---|
| -amba | 'stretch, peg out' |
| -ambana | (formerly with reference to Ithuika ceremony) 'peg anti-social persons to ground covering them with heaps of dry grass and rubbish prior to burning them to death' |
| -umba | 'mould, shape' |
| -umbania | (causative reciprocal) 'mould anyhow' |
| -thamba | 'be cleaned by a medecine-man' |
| -thambania | '(1) clean, wash others, one another; (2) take a deceased man's widow to wife' |
| -gunda | 'be discoloured (of teeth); rot (of calabashes); be depressed (of people)' |
| -gundana | 'become stained entirely' |
| -runga | 'straighten, put straight' |
| -rungana | 'straighten each other, others; deal with each other favourably, give others a fair deal' |
| -gamba | 'make a sound; ring (of bells); bang (of gun); etc.' |
| -gambania | |
| ciana ikĩgambania nyũmba tu | 'the children poured into the house' |
| rugambi, ng'ambi | 'a small bell used as ornament or carried by medicine man' |
| -genda | 'travel' |
| -gendanira | (associative) |
| rugendo, ng'endo | 'journey; trading expedition to Masai country' |
| -amba | 'begin, start, be the first' |
| -ambana | (esp. of a quarrel, fight) 'start to do something to others, each other; start a row, go at each other' |
| -enda | 'want, like, love' |
| -endana | 'love or like one another, love or like somebody' |
| wendani | 'mutual affection |
| wendano | 'affection' |
| rũendano, nyendano | 'extreme favouritism' |

[k] to [g] whenever a voiceless stop or [ð] ( < *c ) follows in the succeeding syllable; for example, kū-genda 'to travel' vs. gū-ṭanda 'to cut'. Dahl's Law no longer affects verb stems constructed with the verbal extension -ik- ; for example, we find gwakika 'become built', based upon the root gwaka 'build'. However, where this extension has been directly incorporated into a root, there is evidence that the Law did apply at one time to stems with verbal extensions ending in [k]. For example, gūūka 'to be dislodged, pulled out', incorporating the reversive-stative suffix -ūk- vs. kūūra 'to pull out, uproot', with the transitive suffix -ūr- . In light of this, it would be difficult to explain forms such as kingima and hindima (rather than **king'ima and **hinima ), except by our assumption that the generalization of the environment of Meinhof's Law was part of the process of morphologization.

The Kikuyu example just cited is by no means an isolated instance of the failure of the more general form of Meinhof's Law to apply in certain morphological contexts. In his *Comparative Bantu,* Guthrie gives examples of eleven Common Bantu stems of the shape ...CVNC..., which are said to be osculant with stems of the shape ...CVNCVN... . "Osculance" here can be interpreted to mean that in some languages, the reflex of the Proto-Bantu verb root does not occur independently of some verbal extension of the form -VN- . What is interesting about these eleven cases is that in those languages affected by Meinhof's Law, none give evidence of the Law having applied in these instances of verb roots with incorporated extensions (at least, not in the reflexes cited by Guthrie). The eleven Common Bantu stems involved in this example are given in Table III. (see p.270)

The data in Table III thus provide further evidence that the emergence of Meinhof's Law as an alternation conditioned by "any following nasal" was the consequence of restructuring through morphologization.

## 4. Conclusion

In this paper, I have tried to show that it is possible to give a detailed reconstruction, with functional motivations, for the history of Meinhof's Law, by interpreting the historical facts with reference to the principles of Natural Phonology. Thus, an interpretation of Meinhof's Law was offered which involved two major theoretical claims: (a) that the Law

Table 3: Common Bantu Stems Incorporating a Suffix of the Shape -VN-

| | | |
|---|---|---|
| 284a | -caŋgam- | 'meet (someone)' |
| 285a | -caŋgan- | 'assemble' |
| 286a | -caŋgan- | 'become mixed' |
| 286b | -caŋganɻ- | 'mix, mix up' |
| 319b | -cendam- | 'become leaning' |
| 584a | -diŋgan- | 'become equal' |
| 711a | -duŋgam- | 'become straight/fitting' |
| 1070a | -kiŋgam- | 'lie across' |
| 1485a | -peŋgam- | 'become bent' |
| 1716a | -teŋgam- | 'become leaning' |
| 2083b | -yɨŋgin | 'come (or go) in' |

(The numbers in this table are the numbers assigned to each in Guthrie 1967-71.)

underwent two stages of historical development, corresponding to the difference between a phonetic process and a morphologically conditioned rule in Natural Phonology; and (b) that each stage had a different functional motivation in Bantu grammar. Hopefully, this functional approach to historical change can be expanded to give increasingly explanatory descriptions of the historical evolution of the Bantu family.

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# SUBJECT IDENTIFICATION STRATEGIES AND FREE WORD ORDER: THE CASE OF SANDAWE*

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A discussion of some of the major morpho-syntactic and syntactic constructions of Sandawe, a Khoisan language of Tanzania, is presented. The role of what are called Subject Identification Strategies is discussed and shown to interact with the free word order found in most main clauses and with the more restricted word order found in certain syntactic constructions. Some generalizations and conclusions concerning these Strategies are then discussed.

## 0. Introduction

This work is intended to serve a number of purposes. First, it is a fairly thorough account of a number of syntactic constructions in Sandawe, a largely unexplored and poorly documented Khoisan language spoken in Tanzania. Only one book has been published concerning any aspects of Sandawe [Dempwolff 1916], and in that work, some thirty pages are on vocabulary, phonology and grammar (the rest is an ethnographic study). For this reason, this work is data-oriented; whenever possible, numerous examples are given in order to demonstrate as thoroughly as possible the point at hand, and hopefully to gain the confidence of the reader in the depth and reliability of the data.

Secondly, the language is of theoretical interest in that it has largely free word order in main clauses, coupled with a truly remarkable system

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of marking many diverse elements of a clause for its subject. I have chosen to examine the overall system of S(ubject) I(dentification) because that system is of theoretical interest and also because it is an excellent springboard for presenting the data in an orderly way. There are a number of what I hope are interesting generalizations to be found concerning the identification of subject in a largely free word order language.

The word order in Sandawe is, to a great extent, free, in that meaningful lexical elements may appear in any order without significantly affecting topic, focus, definiteness, etc. It seems that SOV word order is statistically more prevalent, and might be taken therefore as the underlying word order. In some obscure cases it is the only possible order. But it is also true that other orders are fully acceptable without necessarily implying greater emphasis in one way or another. Topicalization does exist with full pause and intonation breaks separating the topicalized element from the rest of the sentence, but this is completely different from the permutations we will examine in this work. So, with that caveat, Sandawe can be considered a "largely" free word order language.

In the first two sections, we shall examine the basic morphology and syntax of the language in main clauses of simple sentences. We shall be

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partment of Foreign Languages and Linguistics, on various aspects of my research. He, too, was and is examining Sandawe, with emphasis on the tonal system, and he helped me with numerous suggestions and guidance. We had a very free and open exchange of ideas, and it was a pleasure to work with someone who is so scholarly, methodical, and yet so cooperative and helpful. In anticipation of his work on tone, which I know to be of the highest caliber, I am excluding that aspect in my study. I would also like to thank Paul Neubauer, Jan Jakes, Kim Hodges, Susan Stucky, and Chuck Kisseberth for their comments on some of the data presented orally at the Linguistic Institute, Summer, 1978. My principal language assistants were Mr. J.G.D. Wagine, from Ovada, and Ms. R. Duma, from Mtoro. There are a few dialectal differences between them not included in these data and probably not significant. They were both very patient, hard-working, careful, and forgiving, but not unmindful, of my mistakes, and they were happy to consult other speakers on finer points. The elicitation process was in English and occasionally in Swahili for Mr. Wagine and Ms. Duma and in Swahili for other speakers consulted. The use of both languages in elicitation was unavoidable and probably did not have a significant effect on the findings.

primarily interested in the various strategies the language employs to identify the subject. In the third section, we shall examine various syntactic constructions and their formation strategies, and examine the interaction of these strategies with the strategies used to identify the subject. This will take us through the WH-question construction, the cleft construction, and relativization. Various subordinate and complement clause constructions are discussed in Section 4. Finally, a conclusion summarizes the findings of the previous sections.[1]

## 1. Subject-Identification Strategies of the Language

Sandawe has four morpho-syntactic strategies for identifying the subject:

1.1. Verbal Subject-markers (SM). SM's are illustrated in the following singular forms:

(1) a. (ci) ta-s ʔiẽ
(I) run-SM1sg PROG
'I am running'

b. (hapu) ta-i ʔiẽ
(you) run-SM2sg PROG
'you are running'

c. (hewe) ta-a ʔiẽ
(he) run-SM3sgM PROG
'he is running'

d. (hesu) ta-sa ʔiẽ
(she) run-SM3sgF PROG
'she is running'

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[1] As do other Khoisan languages, Sandawe has several clicks in its phoneme inventory. The following symbols are used for these: / = dental click, ! = palatal click, // = lateral click. These are found in plain, nasalized, and aspirated contrastive series. Other orthographic conventions are the following: ejective consonants are marked with a raised comma ( k' , ts' ); tl represents a voiceless and dl a voiced lateral fricative; c is phonetic [tʃ] (which contrasts with aspirated ch ); $s^w$ represents a labialized s (which contrasts with non-labialized s ); nasalized vowels are marked with a tilda ( ʔiẽ , etc.).

The Progressive auxiliary may be inflected for subject:

(2) a. ʔie-sĩ ta
PROG-SM1sg run
'I am running'

b. ʔie-ĩ ta
PROG-SM2sg run
'you are running'

1.2. Nominal case marking. In some cases, nouns may be suffixed with a nominative or an accusative marker. However, these markers are not always used and are actually required in a very small number of cases.

The following example contains the nominative marker -a :

(3) ci-a ta ʔiẽ
I-NOM run PROG
'I am running'

In certain examples and under conditions not fully understood, human direct-object NP's can take an accusative suffix (ACC) -ʦ'- , but again it is not the case that *all* such direct objects must appear with this element. In any event, when the -ʦ'- marker appears on NP's, they are typically human direct objects:

(4) a. /omese //o-ʦ' /a-i
man child-ACC see-SM3sgM,FUT
'the man will see the child'

b. mancha /a-i /omese
food see-SM3sgM,FUT man
'the man will see the food'

Without the ACC marker in (4a), speakers would be unable to determine the assignment of roles for the various arguments in the verb (recall that in Sandawe word order is largely irrelevant to a determination of case). Although sentence (4b) is potentially ambiguous also, it is part of the speaker's knowledge of the world that inanimate items typically do not *see*, so role assignment follows the pattern: animates tend to be subjects, inanimates tend to be objects. Not surprisingly, other languages separate animate (sometimes definite) from inanimate (or indefinite) objects and

typically mark the former in special ways. In Sandawe, a language with fairly free word order, the use of an ACC marker is especially functional in role assignment of animate objects.

Again, it should be emphasized that these case-marking strategies are not available in all of the various syntactic constructions of the language. As we shall see below, subjects tend to be unmarked, while objects receive marking which may be unique to Sandawe but which is *not* ACC marking.

It should also be pointed out that the use of an ACC marker is not, strictly speaking, a SI strategy, because this element does not point to the subject. But as it turns out, speakers can infer by a process of elimination that some other non-ACC-marked NP must be the subject. In the remainder of this paper there will be little further discussion of this ACC marker.

1.3. Marking non-subjects for subject. There is nothing especially striking or unusual about the subject and non-subject identification strategies discussed above, but the following type of SI strategy found in certain (but not all) tenses is certainly highly unusual and possibly is unique to Sandawe: all non-subject NP's (direct, indirect, oblique post-positional, and locative objects) and sometimes even adverbs and complementizers may be marked to agree with the subject. (The verb, too, will be marked to agree with the subject under conditions to be discussed.) To appreciate this, consider the following:

(5) (ci) mancha-s /iwaka koo-na-s hapu-me-s ?iẽ
(I) food-1sg bring house-to-1sg you-for-1sg PROG
'I am bringing food to the house for you'

(6) andika-sa barua-sa Leba-//ana-sa //Hopi-me-sa
write-SM3sgF letter-3sgF Leba-to-3sgF Hopi-for-3sgF
'she is writing a letter to Leba for //Hopi'

(7) ?ie-sĩ ?i?wa hapu-gari-n-s /omesu-tsexe-s
PROG-SM1sg give you-car-DEF-1sg woman-one-1sg
'I am giving your car to one woman'

(8) mana-s k'i-s k'a? /omesw-i tl'apa ?iẽ
know-SM1sg COMP-1sg COMP woman-2sg beat PROG

'I know that you are beating a woman'

(9) hapu tlapume-i /omese-i ute-i
you beat,PAST-SM2sg man-2sg yesterday-2sg

'you beat a man yesterday'

There are no conditions on this extraordinary marking of non-subjects except those to be discussed below. That is, permutation of word order, the appearance of the full subject NP, animateness, definiteness, or other conceivable adjustments to these sentences will not affect the pattern of markers which agree with the subject. I shall distinguish in the morpheme-by-morpheme descriptions between verbal subject agreement markers (cf. section 1.1) and these cases in which objects are marked for subjects by labelling the former as true "SM's", while the latter will be abbreviated simply as to the person and gender of the subject being referred to. We shall see that there are some differences in behavior between the two sets of suffixes, so the distinction is not made lightly.

In the remainder of this paper I will discuss certain restrictions, conditions, and interactions of these various SI strategies and show how they are crucially bound to word order in main and non-main (subordinate or embedded) clausal constructions.

## 2. Conditions on Verbal Subject Marking

The topic I shall consider in this section concerns the marking of verbs in agreement with their subjects. As we have mentioned, Sandawe word order is extremely "free" in the sense that words (and in some cases, constituents) in a main clause may appear in any order whatsoever for a given meaning with little or no change in emphasis or focus on a particular item. There will however be various morpho-syntactic rules concerning verbal subject marking which are crucially dependent on the actual word order selected. I will explicate these rules in the following sections and then lead to a generalization of the SI strategies which are found in more complicated syntactic constructions.

2.1 Constant Subject Marking. In this section I will discuss the simplest possible interaction of word order and verbal marking for subject in main clauses. This is when verbs are marked for subject without restrictions on word order, i.e. "Constant Subject Marking". This is found in the Future and Negative examples which follow; note also that in these tenses objects are *not* marked for subject:

(10) tanga dlomo-che
melon buy-1sgSM,NEG
'I do not buy melon(s)'

(11) ci hewe tlapumee-s
I him beat,FUT-1sgSM
'I will beat him'

Although the SOV word order is statistically the most common, it may be replaced by any possible permutation in the above sentences without necessarily implying special focus on a particular item. Thus, corresponding to (11), we have the following equally acceptable (and attested) examples, all meaning 'I will beat him':

(11) a. ci tlapumee-s hewe
b. tlapumee-s ci hewe
c. tlapumee-s hewe ci
d. hewe ci tlapumee-s
e. hewe tlapumee-s ci

Thus, verbal subject marking is always present in examples like these.

2.2 Conditional subject marking. In the present and past tenses, we find the following situation in main clauses:

(a) the verb is marked for subject under certain conditions,
(b) the objects are marked for subject invariably.

2.2.1. Intransitive verbs. Consider first examples involving an intransitive verb, as in the following, meaning 'I run':

(12) a. (ci) ta-s (*ta)
(I) run-SM1sg (*run)
b. ta-s (ci) (*ta ci)
run-SM1sg (I) (*run I)

The PROG item ?ie˜ may also appear, but when it does, note the alternations both it and the verb root ta may undergo,[2] as in the following, all meaning 'I am running':

(13) a. ci ta-s ?iẽ cf. *ci ta ?iẽ
I run-SM1sg PROG *ci ta ?ie-sĩ

b. ci ?ie-sĩ ta *ci ?iẽ ta(-s)
I PROG-SM1sg run

c. ?ie-sĩ ci ta *?iẽ ci ta(-s)
PROG-SM1sg I run

d. ta-s ci ?iẽ *ta ci ?iẽ
run-SM1sg I PROG *ta ci ?ie-sĩ

e. ?ie-sĩ ta ci *?iẽ ta(-s) ci
PROG-SM1sg run I

f. ta-s ?iẽ ci *ta ?iẽ ci
run-SM1sg PROG I *ta ?ie-sĩ ci

It is impossible to mark both the PROG and the verb for subject in one sentence:

(13) g. *ta-s ?ie-sĩ

h. *?ie-sĩ ta-s

As the preceding data show, the verb or PROG item is marked for subject in the context #(NP)__ (where # = beginning of sentence).

2.2.2. Transitive verbs. Consider now the situation when an object is expressed. As mentioned above, objects ***must*** be marked for subjects in this tense. To simplify the presentation, I shall (a) omit momentarily the permutations with an "expressed" subject, (b) exclude those examples in which objects are ***not*** marked for subject (which would render the sentences automatically ungrammatical). Thus, we have the following examples, meaning 'she buys melon':

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[2]The nasalization of the vowel "floats" from the vowel of the progressive element to the vowel of certain subject markers.

(14) a. tanga-sa dlomo (*-sa)
melon-3sgF buy (*-SM3sgF)

b. dlomo-sa tanga-sa
buy-SM3sgF melon-3sgF

c. *dlomo tanga-sa
buy melon-3sgF

When we include the PROG element, we find again that only the PROG or the verb can be marked for subject, but not both, as in (15), meaning 'she is buying melon':

(15) a. ʔie-sã̃ tanga-sa dlomo (*-sa)
PROG-SM3sgF melon-3sgF buy (*-SM3sgF)

b. ʔie-sã̃ dlomo (*-sa) tanga-sa
PROG-SM3sgF buy (*-SM3sgF) melon-3sgF

c. dlomo-sa tanga-sa ʔiẽ (*ʔie-sã̃)
buy-SM3sgF melon-3sgF PROG (*PROG-SM3sgF)

d. dlomo-sa ʔiẽ (*ʔie-sã̃) tanga-sa
buy-SM3sgF PROG (*PROG-SM3sgF) melon-3sgF

e. tanga-sa ʔiẽ (*ʔie-sã̃) dlomo (*-sa)
melon-3sgF PROG (*PROG-SM3sgF) buy (*-SM3sgF)

f. tanga-sa dlomo (*-sa) ʔiẽ (*ʔie-sã̃)
melon-3sgF buy (*-SM3sgF) PROG (PROG-SM3sgF)

Note that these examples show that the verb or PROG is marked for subject only if either the verb or the PROG is first in the sentence. However, if a full NP subject appears first in the sentence, then a verb or PROG immediately following it is also marked for subject, as in (16), meaning 'the/a woman is buying melon':

(16) a. /omesu dlomo-sa tanga-sa ʔiẽ
woman melon-SM3sgF melon-3sgF PROG

b. /omesu ʔie-sã̃ tanga-sa dlomo
woman PROG-SM3sgF melon-3sgF buy

Thus, we must amend our earlier statement concerning the context in which verb or PROG is marked to agree with the subject to the following: "Mark the verb or PROG in the environment #(SUBJ)___."

2.2.3. Subject + Nominative Suffix examples. In an additional tense used with present tense meaning in some main and subordinate clauses, the subject NP is marked with the nominative suffix -a . Objects are still

marked for subjects and so are verbs, but there are conditions on verbal marking for subject which are slightly stronger than those encountered before. Consider the following, meaning 'the/a woman is buying melon':

(17) a. dlomo-sa /omesw-a ʔiẽ tanga-sa
buy-SM3sgF woman-NOM PROG melon-3sgF

b. /omesw-a dlomo (*-sa) ʔiẽ tanga-sa
woman-NOM buy (*-SM3sgF) PROG melon-3sgF

c. ʔie-sã /omesw-s dlomo tanga-sa
PROG-SM3sgF woman-NOM buy melon-3sgF

d. /omesw-a ʔiẽ (*ʔie-sã) dlomo tanga-sa
woman-NOM PROG (*PROG-SM3sgF) buy melon-3sgF

The difference between this tense and the present and past tense examples of 2.2.1-.2 is that in these examples, the verb or PROG is marked for subject only if it is sentence-initial. Thus, the conditions on verbal subject-marking for this tense are a subset of the conditions noted for present and past tense examples; the difference here is that in this present tense, the subject is marked with the nominative marker -a , whereas in the examples of 2.2.1-2, the subject is always unmarked.

2.3. Generalizations on the subject identification strategy of verbal marking. We have noted in the preceding examples that in the present and past tenses and the subject + a-marked present tense, the verb or AUX is marked for subject when these are sentence-initial. Objects are always marked for subjects in these tenses, while subject is either unmarked or suffixed with -a . The upshot of this system of marking is that despite the possible permutations in a given sentence, *the subject is always identified by the first argument in the sentence.* To appreciate this, consider the following examples, meaning 'the/a woman buys melon':

V-Initial Examples:

(18) a. dlomo-sa tanga-sa /omesu (-a)
buy-SM3sgF melon-3sgF woman (-NOM)

b. dlomo-sa /omesu (-a) tanga-sa
buy-SM3sgF woman (-NOM) melon-3sgF

Object-Initial Examples:

(18) c. tanga-sa dlomo /omesu (-a)
melon-3sgF buy woman (-NOM)

d. tanga-sa /omesu (-a) dlomo
melon-3sgF woman (-NOM) buy

Subject-Initial Examples:

(18) e. /omesu dlomo-sa tanga-sa
woman buy-SM3sgF melon-3sgF

f. /omesu (-a) tanga-sa dlomo
woman (-NOM) melon-3sgF buy

g. /omesw-a dlomo tanga-sa
woman-NOM buy melon-3sgF

The underlined sentence-initial elements in the preceding examples are either the markers *for* subject or are the subjects themselves. Thus, the process of verbal subject marking in combination with object marking for subject may be viewed as part of a general overall SI-strategy which guarantees that despite the potential confusion created by unbounded linear permutations of lexical items in a given Sandawe sentence, the subject will, at least in a large number of cases, be identified in the first lexical argument of the sentence.

It should be clear that I am not claiming that this SI strategy is the only one operative in the language or even that it is applicable to all Sandawe sentences. The future and negative examples illustrated earlier are obvious counter-examples, since if the verb is sentence-final, the identification of subject would be the very last bit of information in the sentence.

Consider again sentences (11) and (11d) repeated below as (19a-b), in which future tense forms are given:

(19) a. ci hewe tlapumee-s 'I will beat him"
I he beat,FUT-SM1sg

b. hewe ci tlapumee-s (same meaning)
he I beat,FUT-SM1sg

Identification of subject is provided only by the last item in the sentence in such examples. Nevertheless, the SI strategy of marking the first argument for the subject is used in a very wide range of Sandawe syntactic constructions and interacts with other aspects of the syntax of the language

in a number of interesting ways. For this reason it has been developed in the preceding sections; it will form the basis of discussion in the following sections.

## 3. Subject Identification Strategies Within Syntactic Constructions Which Limit Word Order

In this section, I will discuss certain syntactic constructions which require more fixed word order. For example, in Sandawe WH-Q's, the WH element appears first. In cleft constructions, the clefted element must be first. In relative clauses, the embedded verb (or PROG) must be last. These constructions restrict the number of word-order permutations within a clause, and, as we shall see, there are further restrictions on some of the SI strategies already discussed. What is interesting then is how the language employs the various SI strategies available to it under the conditions imposed by the syntactic construction in question.

3.1. WH-Questions. As already mentioned, the questioned NP must be first, but after that, various permutations are permissable.

3.1.1. WH-Q of subject. The WH-NP subject is suffixed with the NOM marker -a . Recall that when the subject NP is marked with -a , the verb is marked for subject only when it is sentence-initial. Since the WH-element must appear first, it follows that the verb will never be marked for subject:

(20) a. ho-a ta ʔiẽ 'who is running?'
WH-NOM run PROG

b. ho-a ʔiẽ ta (same meaning)
WH-NOM PROG run

A further restriction on SI strategies found in WH-Q of subject is that objects are not marked for subject:

(21) a. ho-a dlomo tanga (*-a) ʔiẽ 'who is buying melon?'
WH-NOM buy melon (*-3sgM) PROG

b. ho-a tanga (*-a) ʔiẽ dlomo (same meaning)
WH-NOM melon (*-3sgM) PROG buy

Animate direct objects may be marked with the ACC suffix -ts'- , but this is not mandatory:

(22) ho-a tlape ?iẽ //o(-ts') (*-a)
WH-NOM beat PROG child(-ACC) (*-3sgM)
'who is beating a/the child?'

In this construction then, the SI strategy is simple. The WH-element is first and is marked with the NOM suffix -a as the subject.

3.1.2. WH-Q of direct objects. The questioned direct object appears first, but unlike the case involving questioned subjects, this direct object is marked for the subject:

(23) a. ho-co-sa dlomo /omesu ?iẽ 'what is the woman buying?'
WH-thing-3sgF buy woman PROG

b. ho-co-sa /omesu dlomo ?iẽ (same meaning)
WH-thing-3sgF woman buy PROG

In questioning of human direct objects, the ACC marker -ts' may appear:

(24) a. ho(-ts')-is tlape ?iẽ (ci) 'whom am I beating?'
WH(-ACC)-1sg beat PROG (I)

b. ho(-ts')-is (ci) tlape ?iẽ (same meaning)
WH(-ACC)-1sg (I) beat PROG

The SI strategy of marking objects for subjects interacts with the WH-Q formation strategy in an interesting way here. The WH-Q formation strategy puts the questioned object first, but the SI strategy of marking objects for subjects also applies to mark the questioned element for subject. Thus, once again the subject is identified by the first argument in the clause.

To appreciate the full significance of the SI strategy of marking the questioned object, we should consider sentences in which there are additional objects not being questioned:

(25) ho-co-sa dlomo /omesu ci-me (*-sa) ?iẽ
WH-thing-3sgF buy woman I-for (*-3sgF) PROG
'what is the woman buying for me?'

(26) ho-co-s ?iẽ ?i?wa hesu-ts' (*-is)
WH-thing-1sg PROG give she-ACC (*-1sg)
'what am I giving to her?'

Obviously, only the questioned object is marked for subject and other objects are not. This fact becomes significant, however, when viewed in

terms of a SI strategy. Only questioned objects are marked for subject, and questioned elements must appear sentence-initially. Thus, this special marking of questioned NP's (special because other objects not being questioned in this construction are *not* marked for subject) is an essential component of the SI strategy which guarantees that the first argument in the sentence will be marked for the subject.

3.1.3. WH-Q of indirect objects. Indirect objects are in some cases marked with the postposition -me- (cf. examples (6) and (25)) and by ∅ in certain double-object constructions (cf. examples (7) and (26), the latter with -ts'- ). When the indirect object is questioned, it is marked for subject but again no other objects in the clause are marked for subject:

(27) ho-me-i ʔiẽ //o-ts' (*-i) tɬape
WH-for-2sg PROG child-ACC(*-2sg) beat
'for whom are you beating the child?'

(28) ho-ts'-is ʔiẽ ʔiʔwa tanga (*-s)
WH-ACC-1sg PROG give melon (*-1sg)
'whom did I give a melon to?'

Once again, the extraordinary marking of the questioned element for subject of the sentence combined with the fronting of the questioned element to sentence-initial position guarantees that the first item in the sentence identifies the subject.

3.1.4. Which-NP constructions.

3.1.4.1. Which NP (subject). When the 'which NP' questioned is a subject, we find similar patterns as in WH-Q of subjects: the questioned subject NP is suffixed with -a and no objects are marked for subject:

(29) ha-sunsʷ /omesw-a ʔiẽ tanga dlomo
WH-Fem woman-NOM PROG melon buy
'which woman is buying melon?'

3.1.4.2. Which NP (object). The construction for 'which NP' (object) parallels the example of WH-Q of objects: the questioned NP is marked for subject, but no other objects are:

(30) ha-we //o-ts'-i ʔiẽ tl'ape
WH-M child-ACC-2sg PROG beat

'which child are you beating?'

(31) ha-susunsʷ /omesu-ts'-i ʔiẽ ʔiʔwa mancha
WH-F woman-ACC-2sg PROG give food

'which woman are you giving food?'

3.1.5. Whose NP. When questioning the possessive element, the WH element ho- precedes the possessed NP, followed by na? and the remainder of the clause.

3.1.5.1. Whose NP (subject). As might be expected, the possessed NP functioning as a subject is followed by -a ; no objects are marked for subject:

(32) ho tamechw-a na? ʔiẽ //o-ts' tl'ape
WH woman-NOM POSS PROG child-ACC beat

'whose woman is beating the/a child?'

3.1.5.2. Whose NP (object). Paralleling previous questioning of objects, in the WH-possessive construction the object NP is marked for subject; no other objects are marked:

(33) ho gari-sa na? dlomo ʔiẽ ci-me
WH car-3sgF POSS buy PROG I-for

'whose car is she buying for me?'

3.1.6. When? The WH construction for the adverb of time seems to behave as in the construction for (inanimate) objects. That is, the WH element is marked for subject; verbs and objects are not marked for subject:

(34) ha-ʔsu-s ci /i
WH-TIME-1sg I come

'when did I come?'

(35) ha-ʔsw-i ci-ts' tl'apumee
WH-TIME-2sg I-ACC beat, past

'when did you beat me?'

(36) ha-ʔsu-sa tanga dlomo
WH-TIME-3sgF melon buy

'when did she buy a melon?'

3.1.7. Summary. To summarize the findings of this section on WH-questions,

we can note that the following SI strategies are employed in this construction:

1) Questioning of subjects (including 'which NP' (subject) and 'whose NP' (subject)) involves the use of the nominative suffix -a on the questioned subject.

2) Questioning of non-subjects involves marking the questioned non-subject for subject, but no other non-subjects in the sentence are marked for subject.

In other words, in WH-Q constructions, the SI strategy of marking non-subjects for the subject is restricted to only those non-subjects being questioned; at no other time are non-subjects marked for subject in this construction. Now, since the questioned element must be sentence-initial in the WH-Q construction, the result is that either (1) the first element in a WH-Q is identified *as* subject, i.e. by being in the nominative form with the suffix -a when subjects are WH-Q'd; or (2) the first element is marked *for* subject (in the case of WH-Q of objects, where *only* those objects being questioned are marked for subject).

We find then that even when syntactic constructions like WH-Q formation impose limitations on word order (the questioned element must be sentence-initial) and restrictions on the use of the SI strategy of marking non-subjects for subject (that strategy is only employed for the non-subject being questioned), the language nevertheless succeeds in utilizing the general SI strategy of marking the first item of the sentence for the subject.

3.2. Cleft formation. The next construction to be discussed is the cleft formation construction. We shall find that this construction shares a number of properties with WH-Q's on the one hand and relative clause formation on the other. The discussion of cleft sentences will then bridge the WH-Q discussion and the relativization data to be discussed below. As in WH-Q structures, the cleft formation strategy moves the clefted-NP to the front of the sentence. The clefted NP is suffixed with ga? , meaning roughly 'it is that'.

3.2.1. Cleft of subject. The cleft construction for subjects utilizes

relative clause markers on the verb, which must be clause-final (also as in relative clauses). Consider the following:

(37) ci-ga? ?iẽ //o (-ts') tlape-si-si-n-s
I-CLEFT PROG child (-ACC) beat-REL-SM1sg-REL-SM1sg
'it's I who is beating the child'

(38) tamechu-ga? ?iẽ ta-si-su-n-su
woman-CLEFT PROG run-REL-SM3sgF-REL-SM3sgF
'it's the woman who is running'

(39) hapu ga? ?iẽ gari Boba ?i?wa-si-po-m-po
you is PROG cars Boba give(PL)-REL-SM2sg-REL-SM2sg
'it's you who are giving Boba cars'

Note that in these constructions, the clefted subject is not marked with the NOM suffix -a in contrast to the situation in WH-Q of subject. But as in that construction, objects are not marked for subject when subjects are the victims of the rule. The verb is inflected to agree with the clefted subject, but as we shall see, that strategy is not available when clefting non-subjects.

3.2.2. Cleft objects. Although the cleft construction for subjects exploits certain aspects of the REL construction, the cleft construction for objects does not resemble relativization in this way. In the following examples of cleft-objects, the verb does not contain REL formation morphemes or marking for subject:

(40) hapu-ts'-ga?-s ?iẽ tlape
you-ACC-CLEFT-1sg PROG beat
'it's you whom I am beating'

(41) mancha-ga?-sa ?iẽ dlomo ci-me-sa
food-CLEFT-3sgF PROG buy I-for-3sgF
'it's food she is buying for me'

(42) mancha-ga?-sa ?iẽ ?i?wa //o-n-ts'-sa
food-CLEFT-3sgF PROG give child-DEF-anim-OBJ-3sgF
'it's food she is giving the child'

We note first of all that the clefted object is invariably marked for subject. Notice, too, that the additional non-clefted objects are also marked for subject in these cases. This differs from the clefting of sub-

jects and from the WH-Q construction for subjects and objects, where all non-victim objects were not marked for subject. We shall return to discuss this perhaps gratuitous marking of extra objects in our discussion of relative clauses, but for the moment, we can observe that once again the requirements of the SI strategy of marking the first item for the subject are met.

3.2.3. Cleft of indirect objects. The following are examples of clefted indirect objects:

(43) hapu-me-ga?-sa ?iẽ time mancha-sa
you-for-CLEFT-3sgF PROG cook food-3sgF
'it's for you she is cooking food'

(44) ci-ts'-ga?-sa se-?wa mancha-sa ?iẽ
I-ACC-CLEFT-3sgF 1sgOM-give food-3sgF PROG
'it's me she is giving food to'

Again, non-clefted objects are marked for subject in these examples, as, of course, are the clefted indirect objects.

3.2.4. Clefting of obliques.

(45) koo-taŋ-ga?-s //ume
house-front-CLEFT-1sg stand,PAST
'it's in front of the house I stood'

The clefted oblique postpositional NP is marked for the subject of the clause.

3.2.5. Summary of object-cleft. In these examples we note that once again the clefted objects are marked for subject and that any additional objects in the clause are also marked. Thus, the SI strategy of marking the first item for the subject of the clause is accomplished, but in addition any other objects present are also marked for subject.

3.2.6. Summary. To summarize the cleft construction, then, all clefted NP's appear sentence-initially. Clefted subjects are not marked at all and thus are identified *as* subjects. Clefted objects are marked for subject and thus identify the subject. The result is that once again the sentence-initial item identifies the subject of the clause. We shall return to dis-

cuss some of these data after an examination of the REL construction.

3.3. Relativization. Relativization (REL) is another syntactic construction which limits the possible number of word order permutations in a clause. This is because the REL strategy is to have the verb (or PROG) in clause-final position, with the REL markers (suffixes) attached. The morpheme seŋ , from a more abstract /si-e-N/ is the suffix used for a masculine antecedent, while susunsʷ (from /si-su-N-su/ ) appears when the antecedent is feminine.

In addition, the REL verb can be suffixed with the ACC marker -ts'- if the role of the embedded NP deleted under the REL process is non-subject. This -ts'- suffix *precedes* the REL masculine and feminine suffixes. As for word order, both Head + REL Clause and REL Clause + Head are attested. Finally, the entire REL clause can be marked for its role in the *main* clause under the appropriate conditions, e.g. a REL clause modifying an object head could be followed by a marker agreeing with the subject of the main clause. For this reason, I shall discuss the REL formation processes with respect to the role of both the head NP and the (deleted) embedded NP.

3.3.1. Relativization of subject. The strategy for relativizing the subject is simply to have the relative marker -sen or -susunsʷ attached to the verb of the relative clause.

3.3.1.1. Head subject, Rel. subject.

(46) /omese [ʔiẽ gari dlomo-seŋ] ta-a ʔiẽ
man PROG car buy-Rel,M run-SM3sgM PROG
'the man who is buying a car is running'

(47) /omesu [ʔiẽ tanga dlomo-susunsʷ] ta-sa ʔiẽ
woman PROG melon buy-Rel,F run-3sgF PROG
'the woman who is buying melon is running'

Note that the Head-REL structure is treated as a subject for the purposes of verbal subject-marking in the matrix sentence (cf. discussion in 2). Of course, if a non-subject constituent of the main clause were to intervene, the verb would not be marked for subject:

(48) /omesu [ʔiẽ tanga dlomo-susunsʷ] //o-ts'-sa tl'apumee
woman PROG melon buy-REL F child-ACC-3sgF beat,PAST
'the woman who is buying melon beat a child'

3.3.1.2. Head object, REL subject. In this configuration, we find that the entire REL clause is marked as any object of the matrix sentence would be, namely, marked for the subject of the matrix (and in some cases, with the ACC marker -ts'- ):[3]

(49) /iwaka-s //o-n-ts'-is [tanga dlomoo-sen-ts'-is]
carry-SM1sg child-DEF-ACC-1sg melon buy,PAST-Rel M-ACC-1sg
'I am bringing the child who bought melon'

(50) //o-i [ʔiẽ ta-sen- ts'-i] /ikaa
child-2sg PROG run-Rel M- ACC-2sg carry,PAST
'you carried the child who is running'

3.3.1.3. Summary. To summarize constructions we have examined containing embedded REL subjects, we find that within the REL clause, objects are not marked for the embedded subject. Recall that we found the same results in our discussion of cleft and WH-Q formations on subjects, a point to which we shall return shortly. As for the Head NP-REL Clause structure, it was taken as an NP constituent for determining matrix verbal subject marking, as well as for the purposes of matrix marking of objects for subject.

3.3.2. Relativization of direct objects. In this section we shall examine cases in which the relative clause NP is a direct object. As before, we shall sub-divide the section to discuss the different possibilities for the role of the head NP in the matrix clause as well.

3.3.2.1. Head subject, Rel object. In the following examples, the head NP is followed by the REL clause, which contains the accusative suffix -ts' followed by the masculine or feminine relative marker:

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[3]I shall use a close bracket ] to mark the end of the relative clause in these examples, but it should be noted that the ts'- and marker-for-subject suffixes are determined by the role of the *Head* NP, in these cases, the object.

(51) //o-n [hap-a tɬ'ape-ts'-seŋ] ta-a ʔiẽ
child-DEF you-NOM beat-ACC-Rel M run-SM3sgM PROG

'the child whom you are beating is running'

(52) //o-n-su [ci-a ʔiẽ hapu-me-s tɬ'ape-ts'e-susunsʷ]
child-DEF-Fem I-NOM PROG you-for-1sg beat-ACC-Rel F

!awe-sa
fall-SM3sgF

'the girl whom I am beating for you is falling'

In these examples we find that the subject of the embedded relative clause is marked with the nominative suffix -a , while objects in the relative clause are marked to agree with the subject of the embedded clause. Again, the entire REL clause is treated as the subject NP for the matrix verb, so the verb is marked to agree with the subject when the verb is in the appropriate position in the matrix sentence.

3.3.2.2. Head object, REL object. This construction is basically similar to that of 3.3.2.1; the role of the head NP in the matrix clause can also be marked on the relative clause:

(53) [hap-a tɬ'ape-ts'-sen- -ts'i-s] //o-n-ts'i-s /iwaka
you-NOM beat-ACC-Rel M -ACC-1sg child-DEF-ACC-1sg bring

'I bring the child whom you are beating'

(54) tike-s /omesu-ts'is [hap-a tɬapume-ts'e-susunsʷ -ts'-is]
carry-SM1sg woman-ACC-1sg you-NOM beat,PAST-ACC-Rel F -ACC-1sg

'I am carrying the woman whom you beat'

(55) barua-n-s [hesu-me-i ʔiẽ soma-ts'e-sen -s] /ika
letter-DEF-1sg her-for-2sg PROG read-ACC-Rel M -1sg bring

'I brought the letter which you are reading to/for her'

The ACC suffix -ts'- is not found in (55) marking the matrix REL object clause, because the head is not human.

3.3.3. Relativization of other objects. To facilitate discussion in the following, I shall ignore the role of the head NP and the REL clause in the matrix sentence and concentrate on the relations found in the embedded clause.

3.3.3.1. Objects of double-object verbs. Objects of an embedded double-object verb may be relativized, as in the following:

(56) tanga [/omesw-a //o-sa ʔie-iŋ]...
melon woman-NOM child-3sgF give-REL MASC OBJ

'the melon which the woman gave to the child...'

(57) //o-n [/omesw-a tanga-sa ʔie-iŋ]...
child-DEF woman-NOM melon-3sgF give-REL MASC OBJ

'the child whom the woman gave melon to...'

In these examples, the morpheme -iŋ- collapses the notions of MASC + REL OBJ usually expressed by -tse-sen- ; in most cases the forms are interchangeable. Note that any remaining objects in the embedded clause are marked for the subject of that clause.

3.3.3.2. Oblique objects. To relativize oblique post-positional objects, a resumptive pronoun is necessary:

(58) /omesu [hap-a pesa-i hesu-//ache-i ʔisa-ts'e-susunsʷ]...
woman you-NOM money-2sg she-from-2sg steal-ACC-REL F

'the woman from whom you are stealing money...'
lit: 'whom you are stealing money from her'

(59) gari [ci-a hesu-taŋ-is //ume-sunsʷ]...
car I-NOM she(=car)-front-1sg stand-REL F

'the car which I stood in front of...'
lit: 'which I stood in front of her (it)'

3.3.4. Possessives. Relativizing a possessive also requires a resumptive element, but in this case the resumptive pronoun is the possessor element of the possessive construction. Compare:

(60) hesu //owe
she boy

'her boy'

(61) /omesu //owe
woman boy

'the woman's boy'

(62) /omesu hesu //owe-ts'i-s (ci-a) tɬ'ape-ts'e-seŋ[4]...
woman she boy-ACC-1sg (I-NOM) beat-ACC-REL M

'the woman whose boy I am beating...'

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[4]No brackets marking the boundaries of the REL clause are given here for reasons given in the discussion in the following paragraphs.

In the last example, we see clearly that the possessed element (a) triggers relative marker agreement (the verb has -seŋ , the masculine relative marker, and not -susunsʷ , the feminine relative marker) and (b) is marked for the subject of the embedded clause. Both of these facts are unexpected in that the semantic head NP which is restricted by the REL clause in (62) is /omesu 'woman', but apparently //owe-ts'-is 'boy' is being considered the syntactic head NP.

But if //owe-ts'-is 'boy' is the *head*, it should not be marked with the ACC suffix -ts- and with the marker for 1sg subject, -is- , since these morphemes pertain to the role of the *embedded* NP. In all previous examples, a head NP is, appropriately enough, marked for its role in the *matrix* sentence.

It would seem that the possessed NP has an almost indeterminate status in these structures. On the one hand, it is the head NP for the purposes of relative verbal marking, and on the other hand, it is marked for its role in the embedded clause, with a marker indicating the subject of the embedded clause.

It is also relevant to point out the word order in these clauses. As in the following additional example, the embedded subject, when expressed, *follows* the possessed NP:

(63) a. /omesu hesu //owe-sa (ʔiẽ) //onsw-a tɬ'ape-ts'e-seŋ...
woman she boy-3sgF (PROG) girl-NOM beat-ACC-REL M
'the woman whose boy the girl is beating...'

In this case //onsw-a 'girl' is the embedded subject and occurs after //owe-sa 'boy', the embedded object. This contrasts strongly with the situation involving post-positional expressions, since there the embedded subject usually *precedes* the NP + post-position element (cf. examples (58) and (59)).

This suggests that the possessed NP is somehow "out" of the relative clause. This is because the dominant word order in relative clauses is usually SOV, but in no cases may the possessed NP follow the subject of the embedded clause:

(63) b. */omesu hesu //onsw-a //owe-sa (ʔiẽ) tɬape-ts'e-seŋ
woman she girl-NOM boy-3sgF (PROG) beat-ACC-REL M

Apparently, then, the REL of possessives has a number of unusual conditions:

(1) a resumptive pronoun functions to link the possessor and the possessed;

(2) the relative clause treats the possessed NP as the head, in that (a) the relative verbal marking agrees in gender with the possessed NP; and (b) the possessed NP *precedes* the subject of the embedded clause and may not follow it, which suggests that the possessed NP is not in the embedded clause;

(3) yet the possessed NP is marked to agree with the subject of the embedded verb as if it were an embedded object.

Notice, however, that the unexpected marking of //owe-ts'is in (62) and //owe-sa in (63a) does serve the function of identifying the subject of the embedded verb. It would seem then that as we encounter greater complexity in REL strategies, the need becomes greater for extraordinary SI strategies; in this case the SI strategies mark what is syntactically the *head* noun for the subject of the *embedded* clause.

3.3.5. Summary of SI strategies in relative clauses. We may now summarize the SI strategies employed in relative clause formation. For convenience we will examine cases in which subjects are relativized and then cases in which non-subjects are relativized.

3.3.5.1. REL subject summary. When subjects are relativized, there is no overt marking for subject on the various objects within the relative clause, and since subject is deleted, no chance to mark it with the nominative -a suffix, or even to leave it unmarked and thus identify it as subject as opposed to objects. These SI strategies utilized in main clauses are apparently unavailable when subjects are relativized. The only SI strategy present in these structures is the REL agreement verbal suffix, which is, unlike the other SI strategies, a clause-*final* SI strategy.

This fact—that objects are not marked for the deleted subjects within these relative clauses—is perhaps not what might be expected, given our

attempt to provide a functional account of the entire range of SI strategies. If SI strategies are important to the language and if the language has a syntactic construction in which subjects are deleted, then we might expect that it would be exactly in such constructions that remaining non-deleted elements (objects or verbs) should be marked to identify subjects. As we shall see in later discussions, however, there are other constructions involving the deletion of embedded subjects under identity with elements in the higher clause which also fail to mark objects of the embedded clause for the subject.

Another possible explanation for the failure of embedded objects to be marked for their deleted subjects may have to do with the general notion of the "relative accessibility hierarchy". Since subjects are highest on this hierarchy, we expect to find less elaborate mechanisms to be necessary for relativizing on them. Perhaps this is being reflected in Sandawe by not requiring objects to be marked for subject in such structures. Accordingly, we would expect that as we proceed down the hierarchy, the relativization strategies, and perhaps even the SI strategies employed within the REL clause, will increase in morpho-syntactic complexity. This is in fact what we find when we examine the REL object construction.

3.3.5.2. REL object summary. The REL formation strategy becomes more complex for objects than for subjects in that the embedded verb is marked with -ts'- ; the employment of SI strategies increases in that (a) the subject, when expressed, is marked with the nominative suffix -a and (b) any other objects found in the embedded clause will be marked for the embedded subject. Note that since the verb is clause-final, the embedded subject is once again identified by the first argument in the relative clause (be it subject or non-relativized additional objects).

Thus, compared to the REL subject construction, the REL object formation represents an instance in which morpho-syntactic complexity is increased (both in terms of the REL formation strategy and in terms of the SI strategies used) corresponding to a move down the accessibility hierarchy.

3.3.5.3. REL oblique summary. And if we next consider REL formation

strategies for oblique post-positional objects, we find that all the REL strategies for objects are employed, with the addition of a resumptive pronoun preceding the post-positional element; the entire post-positional phrase is then marked for the subject of the embedded clause.

3.3.5.4. REL possessive summary. Proceeding further down the hierarchy to possessive constructions, we find even greater complexity in that (a) the semantic head is not the syntactic head and (b) the possessed NP functions as syntactic head (for embedded verbal relative marker agreement), while also being marked for its role in the embedded clause and identifying the subject of that clause.

3.3.5.5. General REL summary. Thus, as we proceed down the accessibility hierarchy in relativization, we find that SI strategies are employed in increasing measure the further down we go. At the highest point on the hierarchy, subject position, we find no SI strategies used. At the next point down, non-oblique objects, we find identification of subject and marking of additional objects for subject. As for obliques, we find resumptive pronouns which, combined with their post-positional elements, are marked for the subject of the embedded clause. Finally, in the strange case of the possessive relative clause formation strategy, the "quasi-head" is marked for the subject of the embedded clause.

Thus, the degree to which SI strategies are employed within REL clauses is related to the "complexity" of the REL clause, which in turn is related to the position of the grammatical relation on the accessibility hierarchy for relativization.

3.3.6. Summary relating relativization and cleft formation. The preceding discussion concerning SI strategies and syntactic complexity encountered as we proceed down the accessibility hierarchy in relative clause formation was mirrored in the cleft construction discussed earlier in Section 3.2. There, too, we found that when subjects were clefted, no objects in the clause were marked for subject. As we proceeded to direct objects and indirect objects, we found that any non-clefted objects in the clause were also marked for subject (resumptive pronouns are not attested in my cleft data). Thus, in at least two syntactic constructions, the degree to which

SI strategies were employed could be related to the degree of complexity encountered in the constructions when one proceeds to victimize various grammatical relations in descending order on the accessibility hierarchy.

With respect to the generalized SI strategy of marking the first argument in the sentence as or for the subject, in the cleft construction this was invariably accomplished. In the REL formation construction, that SI strategy—applicable to the embedded *clause*—was realized in all cases except those in which subjects were relativized.

And, of course, in other main clause phenomena, that SI strategy was employed again and again. Its functional importance in the language in both main and embedded clauses cannot be underestimated.

4. Non-Relative Subordinate Clauses

In this section we shall examine various non-Relative subordinate clause and complement structures, and the interaction of certain slightly different SI strategies. Although some of the SI strategies employed in these clauses are different in *form* from those previously discussed, their *function* will be shown to be closely related to previous strategies.

4.1. "And-then" clauses. To express the notion of "and then" between two clauses, Sandawe has a set of conjunctions which agree with the subject of the second clause. These introduce the second clause, followed by the subject and then optionally by ki(a) , a conjunctive element:

(64) /omesu-s tlapumee pa hewe kya /omese-a tlapumee
woman-1sg beat,PAST CONJ,3sgM he CONJ man-3sgM beat,PAST
'I beat a woman and he then beat a man'

(65) /omese-s tlapumee sa //okochw-a tanga-sa dlomoo
man-1sg beat,PAST CONJ,3sgF girl-NOM melon-3sgF buy,PAST
'I beat a man and then a girl bought a melon'

Note that the use of these conjunctions agreeing with the subject of the second clause results in the marking of the first item of the embedded clause for subject.

4.2. "When" clauses. Within the lower adverbial clause expressing "when" the various SI strategies found in main clauses are employed.

4.2.1. si? structures. In one "when" construction, the element si? appears embedded-clause-finally, followed by a marker agreeing with the subject of the main clause (cf. certain REL (49,50,53,54) clauses in which the head NP is an object, for a similar instance of an entire clause being marked for the subject of the upper clause). Note that if the adverbial clause precedes the main clause verb, that verb is not marked for its subject:

(66) hesw-a /i si? -is ta
she-NOM come when -1sg run,PAST
'when she came, I ran'

(67) //o-n-sa /ika si? -is ta
child-DEF-3sgF bring when -1sg run,PAST
'when she brought the child, I ran'

Of course, if the verb of the main clause precedes the adverbial clause, then the main verb is marked for its subject (and again the adverbial clause agrees with the main subject):

(68) ta-s hesw-a /i si? -is
run-SM1sg she-NOM come when -1sg
'I ran when she came'

4.2.2. hi- structures. Another construction expressing "when" employs the element hi- , which is then inflected for the subject of the embedded clause. When this happens, hi- appears first in the lower clause:

(69) hi-a hew-a /i -sa ta
when-3sgM he-NOM come -3sgF run
'when he came, she ran'

(70) hi-o /ati -?aa gi$\check{r}$be
when-1pl come,pl -3pl run,pl
'when we came, they ran'

4.2.3. Summary of "when" structures. Note that there are a number of SI strategies involved in these examples. In the lower clauses with clause-final si? , the SI strategies of main clause phenomena are used. In lower clauses with hi- , the SI strategy of marking the first item of the

clause ( hi- ) for the subject of that clause is utilized. As for the main clauses, the SI strategy of marking the first item for subject is guaranteed by marking the adverbial clause for the subject of the higher sentence or, when appropriate, by marking the higher verb for its subject.

4.3. "Because" clauses. Within a subordinate "because" clause, the subject typically takes the NOM suffix -a , objects are marked for subjects, and the clause final verb is the infinitival form; the suffix me (the same element added to nouns, meaning 'for') is added to the verb. In the above examples involving "when" clauses, we saw that the adverbial clauses were themselves consistently marked for the subject of the main clause. In the following "because" clauses, the lower clause is marked for the subject of the upper clause only when the adverbial clause precedes the main clause:

(71) ʔie-sã ta hap-a //o-ts'-i ʔiẽ tlape-o-me
PROG-SM3sgF run you-NOM child-ACC-2sg PROG beat-INF-for
'she is running because you are beating the child'

(72) hap-a //o-ts'i tlape-o-me -sa ʔiẽ ta
you-NOM child-ACC-2sg beat-INF-for -3sgF PROG run
'because you are beating the child she is running'

Considering once again the SI strategies for main and lower clauses, we see that for lower clauses, SI strategies are essentially similar to those found in independent clauses. As for the SI strategies for main clauses, the marking of the "because" clause for the subject of the main clause occurs only when needed: whenever the "because" clause precedes the main clause. When the "because" clause follows the main clause, the main clause subject will be identified by the usual main clause SI strategies.

4.4. Summary of non-relative subordinate clauses. The structures involved in embedded non-relative clauses contained some previously unencountered SI strategies. For "and-then" clauses and certain "when" clauses, these SI strategies were the marking of conjunctive elements for the subject of the embedded verb. In addition, the regular SI strategies employed in main clauses were available in the embedded clauses. Finally, in the "when" and certain "because" clauses, there were strategies for identifying the main

clause subject which involved the marking of the entire embedded clause in agreement with the upper subject. The overall SI strategy of marking the first element of a main or embedded clause as or for its subject is once again successfully carried out.

4.5. Object complement clauses. In this section we shall examine various verbal object complement types. In the first section we shall examine clausal complements of verbs like 'say', 'see', and 'know'. In later sections we shall examine complements of verbs like 'want' and 'persuade', with EQUI and non-EQUI situations discussed. We shall then summarize the findings.

4.5.1. Sentential complements.

4.5.1.1. k'i-...k'a? complements. In the following examples, the verbs 'say', 'know', and 'hope' take complement clauses as their objects. The complementizers in these cases agree with the subject of the higher verb:

(73) bo-s k'i-s k'a? //o-i tlapumee
say-SM1sg COMP-1sg COMP child-2sg beat,PAST
'I say that you beat a child'

(74) mana-sa k'i-sa k'a? /omesu-s tlape ?iẽ
know-SM3sgF COMP-3sgF COMP woman-1sg beat,PROG
'she knows that I am beating a woman'

(75) dime k'i-i k'a? /omesu tlapumee-su //o[5]
hope COMP-2sg COMP woman beat,FUT-SM3sgF child
'you hope that the woman will beat a child'

Note that within the complement clauses, the regular main clause SI strategies are used exactly as in main clauses.

4.5.1.2. 'see' complements. The verb 'see', /an , has some unusual properties. In the first place, it does not take k'i- k'a? as a complementizer. Secondly, the verb may take an object marker agreeing with the subject of the lower clause. SI strategies in the lower clause are exactly like those in main clauses:

(76) /am-po-sa tang-i dlomo ?iẽ
see-OM2sg-SM3sgF melon-2sg buy PROG
'she sees you are buying a melon'

[5]The verb dime is never inflected for person.

(77) /an-(su-)s gari !awe-sa ?iẽ
see-(OM3sgF-)SM1sg car fall-SM3sgF PROG
'I see the car is falling'

4.5.1.3. Summary of sentential complements. The examples herein have several common properties. In the first place, the complement clause is never marked for the subject of the higher clause, although the complementizer, when expressed, is marked for the higher subject. Secondly, the embedded complement clauses make use of the same SI strategies found in main clauses.

4.5.2. Reduced object-complement structures. In this section we shall examine the complements of verbs like 'want' and 'persuade', which involve EQUI and B-Raising (the term used by Postal [1974] to refer to Subject-to-Object Raising). A common phenomenon in much of the data in this section is the failure of the regular SI strategies to apply in the complement clauses. In later sections we shall discuss this fact in greater detail.

4.5.2.1. 'want' complements and EQUI. In Sandawe, the rule of EQUI will delete the subject of a clause embedded as the object of taka 'want' under identity with the higher subject. The lower verb will be marked as if it were an object of the upper clause:

(78) a. ci ta-ʔõ-ts'-is taka
I run-inf-ACC-1sg want,PAST

or

b. ci taka-s ta-ʔõ-ts'-is
I want,PAST-SM1sg run-inf-ACC-1sg
'I wanted to run'

The objects of the embedded verb whose subjects are deleted by EQUI are not marked for subject (objects of embedded verbs are underlined):

(79) //o tl'ape-õ-s taka
child beat-inf-1sg want
'I want to beat a child'

(80) taka-i hapu //o tl'ape-õ-i
want-SM2sg you child beat-inf-2sg
'you want to beat a child'

4.5.2.2. 'want' complements in non-EQUI constructions. There is an interesting development in non-EQUI situations with the verb ɬaka suggesting the existence of B-Raising. When the embedded clause is intact, i.e. not separated by main clause items, only the entire clause is marked for the subject of ɬaka :

(81) a. hapu ɬa-ʔõ -sa ɬaka
you run-inf -3sgF want

or

b. ɬaka-sa hapu ɬa-ʔõ -sa
want-SM3sgF you run-inf -3sgF

'she wants you to run'

(82) a. (ci-a) hapu //o-n-su ɬlap-ume-õ -ts'-is taka
(I-NOM) you child-DEF-Fem beat-PAST-inf -ACC-1sg want

or

b. ɬaka-s hapu //o-n-su ɬlap-ume-õ -ts'-is
want-SM1sg you child-DEF-Fem beat-PAST-inf -ACC-1sg

'I wanted you to beat the girl'

But these examples alternate with the following, in which the subject of the embedded verb becomes marked for the subject of the upper verb, and in some cases with the ACC marker -ts'- :

(83) (hesw-a) hapu-sa taka ɬa-ʔõ
(she-NOM) you-3sgF want run-inf

'she wants you to run'

(84) (ci-a) hapu-(ts'-)is taka //o-n-su ɬlap-ume-õ-ts'-is
(I-NOM) you-(ACC-)1sg want child-DEF-Fem beat-PAST-inf-ACC-1sg

'I wanted you to beat the girl'

Apparently, when subjects are B-Raised, embedded transitive and intransitive verbs trigger slightly different morpho-syntactic features: in intransitive verbs, the infinitive is not marked for its role in the main clause, nor is it marked for the subject of the main clause; whereas for transitive embedded verbs, the ACC marker and a marker for the subject of the upper verb are found.

A rule of B-Raising would account for the appearance of the main clause markers -ts'- and the marking for the main clause subject on the elements hapu-sa in (83) and hapu-ts'-is in (84), since according to this analy-

sis these items are derived main clause objects.

Notice that in the non-B-Raised examples of (81-82) and in the B-Raised items (83-84), the objects of the embedded verb are not marked for the embedded subject. We shall discuss this in later sections.

4.5.2.3. 'persuade' object complements. A complementizer introducing the clausal object of 'persuade' appears in the following examples. The NP's functioning as the underlying object of 'persuade' and as subject of the embedded clause appear in the upper clause, and the complementizer agrees with the NP's and introduces the embedded clause. (Note: the verb in this case is not the future tense because verbal SM's are obligatory in that tense.)

(85) mama?se-s /omesu-s sa //o tlapume
persuade-SM1sg woman-1sg COMP,3sgF child beat
'I persuaded the woman to beat the child'

(86) mama?se-s ?iẽ hapu-ts'-is ko //o tlapume
persuade-SM1sg PROG you-ACC-1sg COMP,2sg cjo;d beat
'I am persuading you to beat the child'

Note that in these examples, the object of the embedded clause is not marked for its subject.

4.5.2.4. Summary of 'want' and 'persuade' complements. We may now summarize some of the findings of this section. Clauses which are the embedded objects of verbs like 'want' and 'persuade' do not utilize the SI strategies found in main clauses. In such clauses, we note that neither verbs nor objects are marked for the subject of the embedded verb. How, then, are subjects of these lower clauses identified? And furthermore, is there any generalization available concerning the *absence* of the main clause SI strategies in these examples?

4.5.2.4.1. EQUI summary. Let us first consider the EQUI NP-deletion cases with taka 'want'. Assuming that speakers have access to derivational history, the deleted, underlying subject of the embedded verb can be recognized as being identical to the appropriate NP of the upper clause. Therefore, subjects of embedded clauses can be identified.

As for the fact that objects are not marked for the subject of these

object complement clauses, we might propose then that whenever subjects are deleted under identity with elements of a higher clause, there is no marking of objects for subject.

There are other verbs in addition to ɬaka which involve EQUI and no marking of the embedded object:

(87) daa-s //o ɬlapume-õ-ts'
be able-SM1sg child beat-Inf-ACC
'I was able to beat the child'

(88) //o ɬlapume-õ-sa daa
child beat-Inf-3sgF be able
'she was able to beat child'

(89) //ʔue-sa //o ɬlap-õ-sa
try-SM3sgF child beat-Inf-3sgF
'she is trying to beat a child'

In each case, the embedded object //o is not marked for the subject of the embedded clause which has been deleted by EQUI. Presumably, then, speakers have access to the derivation of these forms, and thus to the underlying embedded subject. In all cases involving EQUI, objects are not marked for the deleted subject.

In the examples with mamaʔse 'persuade' we find that there are several strategies to identify the subject of the lower clause. Assuming access to the EQUI analysis, the upper object is identified as the lower subject. Furthermore, the complementizer introducing the embedded clause also identifies the subject of that clause. Once again, objects in the embedded clause are not marked for subject in accordance with our proposal stating that this occurs whenever subjects are deleted.

4.5.2.4.2. B-Raising summary. In the examples with B-Raised objects, we may again assume that speakers have access to the derivation in which those derived upper clause objects (marked as such in the upper clause) originated as subjects of the lower clause.

To account for the absence of any marking of lower objects for subject, we might amend the above generalization involving deletion of embedded subjects to something like: whenever an embedded subject is *removed* from its clause, there is no marking of objects for subject. "Removal" would then

include deletion, as in the EQUI situations, and B-Raising, as in the examples of this section.

4.5.2.4.3. Removal of subject summary. We have proposed that objects of embedded clauses whose subjects have been deleted or removed are not marked for the deleted or removed subject. This analysis can be extended beyond the EQUI and B-Raising structures to the REL and cleft formations of subject discussed earlier. Recall that just when subjects are the victims of these rules, objects in those structures are not marked for the subject. Of course, it is precisely in those structures that subjects are deleted or removed from their clauses. Finally, in imperative forms, objects are not marked for the deleted 2sg subject: (Note: The postulation of a higher clause like: 'I order you' dominating the underlying 'you beat child' has been suggested by Ross [1967] as the deeper structure for such sentences. EQUI deletes the lower "you".)

(90) tlapume-ko //o (*-i)
beat-IMP child (*-2sg)
'beat the child'

So, we may summarize our findings in the following statement: "If the subject of a clause is removed, then the objects of that clause are not marked for the subject."

This statement cannot account for all instances in which objects are not marked for subject. For instance, in WH-Q's, only the questioned object is marked for subject, whereas others are left unmarked. And, of course, in future and negative main clauses, objects are not marked for subject. These are restrictions on object marking for subject that go beyound the conditional statement here; there may or may not be a generalization in those cases.

4.5.2.4.4. Word order as an SI strategy. There are sentences in which none of the SI strategies discussed so far are applicable. These are represented by examples (82a-b), in which embedded object clauses contain transitive verbs. Example (82b) is repeated below for convenience as (91):

(91) taka-s hapu //o-n-su tl'apume-õ -ts'-is
want-SMlsg you child-DEF-Fem beat-Inf -ACC-lsg
'I want you to beat the girl'

In the embedded clause, how are we to determine which argument is the subject, and which the object? It turns out that in such cases, speakers will rely on word order to identify the roles of the arguments in the clause. So, speakers will rely on the SOV word order as an SI strategy. It should be pointed out that within my corpus the B-Raised structures which correspond to examples (82a-b) are far more numerous than the non-B-raised examples. Of course, the B-Raised examples do not rely on word order as an SI strategy for the subject of the lower clause. Thus, only in a small minority of cases is the SOV word order actually used as the sole SI strategy in the language. As was mentioned earlier, SOV word order is statistically favored, and so when the order of the embedded constituents of (91) is switched, a different meaning is assigned, as in (92):

(92) taka-s //o-n-su hapu tlapume-õ -ts'-is
want-SMlsg child-DEF-Fem you beat-Inf -ACC-lsg
'I want the girl to beat you'

Perhaps future research on this issue will account for the fact that objects are not marked for the subjects in the embedded clause, since removal is certainly not involved in these cases. Note: The reason cannot be due to the presence of finite vs. non-finite verb forms in the clause, since in the REL object construction non-finite verbs are employed but objects are marked, whereas in REL-subject constructions, and many of these complement forms, non-finite verbs are used but objects are not marked. Furthermore, in future and negatives, finite forms of the verb are used but objects are not marked for subjects.

## 5. Conclusion

We have examined a fairly wide range of syntactic structures in Sandawe, and discussed the use of various SI strategies within these structures. In early sections, we examined the interaction of conditioned verbal marking for subject and word order, and discovered that verbs are marked for subject in certain tenses only when the verbs are sentence-initial or preceded by the unmarked subject. Since objects are marked for subject in

these examples, we were led to the following SI strategy: the first argument in the sentence is marked either as or for the subject of the sentence.

We then examined a number of syntactic constructions whose formation strategies imposed restrictions on word order and on the use of SI strategies. Thus, in WH-Q's, the questioned element must be sentence-initial, and objects not questioned are not marked for subject. We saw that the language overcame the possible difficulties in subject identification caused by such restrictions by requiring nominative marking on questioned subjects and marking for subject only on the questioned object (or adverb). The use of these special markings served to guarantee that the overall SI strategy of marking the first element in the sentence or clause as or for subject was realized.

Additional SI strategies were used in the cleft and REL structures. When objects were victims of these rules, either the objects were themselves marked for the subject of the clause (only in cleft formation) or the subject was expressed (with or without the NOM suffix) thus identifying the subject. If there were other objects in the clause in addition to the object victims of these rules, then these objects were marked for the subjects of their clauses, again guaranteeing that, whatever the word order chosen, the subject is readily identified.

Finally, in complement clauses, either the SI strategies of main clauses were employed, or the marking of complementizers for the subject of the embedded clauses were used. It was claimed that in EQUI and B-Raising cases, speakers have access to derivational history to enable them to identify embedded clause subjects. The fact that the SI strategy of marking objects for subject was never employed in these structures allowed us to uncover the generalization that whenever subjects of embedded clauses are deleted or removed, the objects of such clauses are not marked for subject. This generalization could also account for the absence of objects marked for subject in other cases such as Imperative Formation, REL of subject and cleft of subject. So, speakers can identify subjects of these clauses with the knowledge of that generalization as part of their grammar.

Thus, the SI strategies found in Sandawe range from fairly commonplace processes such as verbal agreement marking and nominal case marking to the

more exotic system of marking objects, complements, and complementizers for subject.

In the same way, marking of elements for subject can be a derivational process ranging from the system of derived verbal marking dependent on word order to a (syntactic-) construction-specific condition to mark objects for subject only when such objects are questioned. As we have seen, such strategies interact in a variety of ways with many of the syntactic construction formation strategies to grauantee that the subject is readily identified despite the numerous permutations of word order permissable in the language.

The whole system is remarkable and interesting, and calls for further research, which I hope to undertake in the future.

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Ross, John R. 1970. "On declarative sentences." In R.A. Jacobs and P.S. Rosenbaum (eds.), *Readings in English Transformational Grammar*, pp. 222-272. Waltham, Mass.: Ginn.

This section is for short remarks on articles dealing with African languages which have appeared in *Studies in African Linguistics* or elsewhere and for contributions which are too short to constitute full articles. These may be short descriptive or historical statements of interesting phenomena in African languages or theoretical comments utilizing African language data.

Contributions to "Notes and Queries" should be less than 1000 words, including examples. No footnotes should be used, but references may be listed at the end.

Studies in African Linguistics
Volume 10, Number 3, December 1979

# THE AFRIKANER AND HIS LANGUAGE

(Remarks on R. Angogo, "Language and politics in South Africa")

Yvette Stoops
Antwerp, Belgium

The linguistic situation in South Africa is as complicated as the political one. This is obvious when one reads Angogo [1978]. However, the reader who is not familiar with the subject is given here a one-sided and even completely erroneous impression. In my remarks I'll stick to pure linguistic and historical facts, as I don't want to judge political facts and intentions of the present South African government.

In reference to §2, the so-called "Coloured" population in South Africa originated in the 17th century from mixed blood but initially not "particularly (from unions) between Whites and Hottentots" (p. 211). Recent investigation has shown that so-called "Free Blacks", many of whom had a white father, fairly often married a "Free Burgher". These people can be considered as "the ancestors of today's Coloured population" [Böeseken 1977:97]. Black slaves "came from all parts of the East and from the West Coast of Africa" [Böeseken 1977:97] not from Southern Africa. The statement that Afrikaans "has borrowed from both African and Malaysian languages" [Angogo 1978:211] is an oversimplification of the real situation, as will be shown in connection with §7.

The historical sketch in §3 needs rectification in almost every sentence: "The Bantu people were living in what is now South Africa when the first Dutch and French Huguenot settlers arrived in the 1600's" (p. 212). The Bantu people had no contact with the Whites in the 17th century, as the Whites only had settled in the southern part (Cape Town) and Bantu people invaded the north of South Africa at about the same time. (It is of course a litigious question, opposing black and white propagandistic claims on the rights of the firstcomers. It is clear, however, that Whites and Bantu people made real contact only in the last quarter of the 18th century [*Encyclopedia Britannica Macropaedia - Knowledge in Depth*, London, 15th ed., Vol. I, p. 270, Vol. III, pp. 791-792, Vol. XVII, pp. 279-280].

With the phrase "Dutch and French Huguenot settlers" and the sentence "these settlers came to South Africa at a time of religious oppression in Europe, and they left their motherland to escape from such oppression" (p. 212), the author shows her lack of knowledge of European history: the term "Huguenot" can only be applied to persons of French extraction, not to Dutch people. Religious oppression against the Huguenots existed in France, so Huguenots emigrated to Holland and from there to South Africa, but not before 1685, the year of the revocation of the Edict of Nantes. At that time, the Dutch had already firmly established their settlement in South Africa, as they landed in Table Bay in 1652 [Boxer 1965]. The best proof is that, with the exception of a few names, almost no French influence can be found in the language and culture of the Afrikaner (note that the spelling *Afrikaaner* is obsolete).

Who were the original Dutch settlers? Did they leave Holland on religious grounds? By no means: Holland was a Calvinistic country. If people in Holland have been oppressed for their religion, it certainly didn't happen to the 17th century Calvinist ancestors of the present day Afrikaners. It is general knowledge they left Holland in the service of the Dutch East Indian Company. Van Riebeeck, the founder of South Africa, was sent to the Cape in order to establish a refreshment post halfway between Holland and East India (the present day Indonesia); the settlement was implanted for economic, colonial and political purposes. One who does not know this does not understand the background which is necessary to see the consequences of that settlement in historical, political, economical, cultural, and linguistic fields.

As the Dutch colonists at the Cape depended entirely on the Dutch East Indian Company, I don't think "their first institution" was "indeed a democratic constitution" (p. 212). When Angogo claims "the Africans and settlers lived peacefully together" (p. 212), this might cause misunderstanding. First of all, I doubt if this statement is true. In the 17th century diaries and official reports, one can read about constant clashes of Dutch officials and colonists with Hottentots and Bushmen. Secondly, it must be clear that "Africans" in this context must have been Hottentots and Bushmen, not the ancestors of the present day South African Bantu people, unless the author means that the Whites and the Bantu people lived peacefully together because they lived more that 1000km apart.

She states, "The British arrived in the late 1700's and from the beginning they were at odds with the Afrikaaners, whom they found there" (p. 212), but for real understanding of the historical facts, it must be emphasized that the British were at war with the Dutch at that stage. To the British, South Africa was a colony, taken from the Dutch; for the Dutch colonists, the British came as invaders, oppressors who tried to eradicate every vestige of the Dutch past, including the Dutch language. No wonder "they were at odds" [Boxer 1965].

The title of §7 is "Creole", a title probably chosen to shock the Afrikaners, as indeed they do not like to be reminded of the fact that their language has some features which could be described as creolisms. However, it is a gross exaggeration to call Afrikaans a creole. Even the great linguist Hessling, whose opinions about the origin of Afrikaans were not accepted by most of his Afrikaner colleagues, never called Afrikaans a creole language [Hessling 1923]. On the other hand, not a single Afrikaans linguist is so ignorant to believe that Afrikaans "is singularly free from the taint of foreign influence" (p. 218). (To think of the Afrikaner intellectuals as a bunch of racist idiots is the biggest mistake their opponents can make!) If one claims, as does Angogo, that Afrikaans was the result of the mixing of Dutch, Malaysian, and African languages, one must keep several points in mind: (1) in this context, "African" does not mean "Bantu" (Nguni- and Sotho-languages), which had no influence whatsoever on the origin of Afrikaans; a few words of Hottentot origin may be found, but no evident influence on the language structure has been proved yet. (2) Malaysian (and Portuguese) influence can be found in the vocabulary, mainly in the case of objects, plants, and dishes associated with the colonial

way of life, one of the few exceptions being the frequent adverb and adjective baie 'much'; it must be kept in mind that the Cape fell under the Dutch-Indian administration in Batavia (now Djakarta). (3) It is true that the simplification of the Afrikaans morphology, compared to Dutch, is a striking fact for which no plausible explanation has been found. Creolization might partially account for this, but several other explanations are no less probable: many (white) servants of the Dutch East Indian Company were foreigners. It is a well known fact that many Germans and Scandinavians, who must had poor command of the Dutch language, played an important role at the Cape. The educational level of the Dutch soldiers and settlers was very low. To any scholar of the 17th century Dutch language, it is clear that in that period the language underwent important changes and that a big cleft between the ordinary spoken language and literary Dutch arose. The Dutch language (in Europe) was to a certain extent stopped in its natural evolution by the growing force of the standard language, but this was not the case in the remote and backward settlement in Africa. Trying to "explain" all differences between Afrikaans and Dutch by the miracle word "creolization" shows a highly unscientific approach to the problems of the origin of Afrikaans.

Another statement, probably resulting from lack of real knowledge of the Afrikaners, is the following one: "many Afrikaaners have transferred their ideal of racial purity to the purity of their mother tongue ... . As a result, a number of Afrikaaners advocate keeping their language free from the corrupting influence of foreign words, especially of English words" (p. 218). The effort to discard English words has nothing whatsoever to do with "racial purity". English speaking people of European descent are not considered to be less "white" than Afrikaners, so English words cannot be stigmatized as being "black" or "coloured". In fact, it is just a reaction of a small language community that fears the increasing and suffocating influence of an international language. This can be noticed everywhere in the world, e.g. the Dutch speaking Flemish people have a greater tendency to avoid foreign words than the speakers of Dutch in Holland, just because they have had to struggle for the survival of their language. If I understand Angogo well, Bantu speakers in South Africa don't seem to be very happy with the "bantuizing" of English (and Afrikaans) words either. Does that mean they are concerned with "racial purity" as well?

In her statements, Angogo has evidently been influenced by Valkhoff [1971]. This is implicit in her reference to Sebeok [1971], which contains the Valkhoff article, and it is even clearer in statements made by Angogo which paraphrase some of Valkhoff's exaggerated claims. For example, she says "Afrikaaner linguists tend to confine the study of their language to the useage of whites. In historical studies, only when a linguistic phenomenon occurs among whites it is regarded as being a legitimate part of the language" (p. 218). Compare this with the following statement by Valkhoff [1971:464]: "Furthermore these and other linguists are also apt to confine themselves to the study of their language in the mouths of the Whites. When an Asian or African slave or a Hottentot is reported to have used a sentence or creolized—wrongly called 'corrupted'—Dutch, long before we have examples of simplification by Whites, the fact is not entirely

ignored but is simply recorded as an anecdotal event. Only when the same linguistic phenomenon occurs among white speakers does it become part of the history of the Language." Valkhoff is very critical of the present political situation in South Africa, an opinion to which he is of course absolutely entitled, but unfortunately his opinions about Afrikaans are the only ones available in English. These opinions have been seriously criticized by, among others, Raidt [1975], Raidt [1977]. Angogo does not mention a single Afrikaans linguist in her bibliography, and by referring only to the one-sided (and even false) opinions of Valkhoff, in the end she leaves not scientific truth, but anti-Afrikaner propaganda.

I am not going into the matters dealt with in other sections of Angogo's paper, but I cannot refrain from commenting on one passage in §6.1: "For the whites there are eleven universities: 6 English-speaking and 5 Afrikaans-speaking. The policy of separate development has effectively divided children and isolated them in monolingual shools during the most impressionable years of their lives." Angogo seems to ignore the existence of the University of Port Elizabeth, a bilingual university, attended by about 3000 youths, 55% of them Afrikaans and 45% English speaking, where half of the subjects are taught in Afrikaans, half of them in English. As I said in the beginning, I have no intention of judging the South African government policies, as I am not qualified to do so. For the sake of scientific truth, however, I really do hope Angogo's views about politics are more reliable than those about the Afrikaner, his history, and his language.

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[Editor's note: This paper exceeds the *NOTES AND QUERIES* 1000 word limit. The author was not aware that such a section existed, so the paper has been included with only slight revision by the editor.]

*Conference report:*

Symposium on

# THE CHAD LANGUAGES IN THE HAMITOSEMITIC-NIGRITIC BORDER AREA

Philipps-Universität, Marburg
October 2-4, 1979

Tuesday, October 2

Morning

Herrmann Jungraithmayr, "Chadic within Hamitosemitic or between Hamitosemitic and Nigritic?"

Otto Rössler, "Semitohamitisch - Sprachstamm oder Sprachtypus?"

Luc Bouquiaux, "Problèmes de la linguistique comparée 'nigritique' dans la zone limitrophe septentrionale"

Chaim Rabin, "Ron-Semitic vocabulary isoglosses as evidence of Hamitosemitic retentions"

Aron Dolgopolsky, "Chadic - Semitic - Cushitic: Some etymological and phonological correspondences"

Afternoon

Burkhart Kienast, "Zur Geschichte des semitishen Verbums"

Ekkehard Wolff, "'Aspect' and aspect-related categories in Chadic"

Zygmunt Frajzyngier, "Verbal system in Pero and reconstruction of verbal classes in Chadic"

Henri Tourneux, "Les classes verbales en mulwi"

Wednesday, October 3

Morning

Dandatti Abdulkadir, "The social settings and occasions for oral poetry in Hausa/Fulani society"

Hans G. Mukarovsky, "Lateinische Lehnwörter im Hausa"

Carleton T. Hodge, "The Hausa relative"

Dauda M. Bagari, "Some aspects of the Guddiri dialect (of Hausa)"

Afternoon

Russell G. Schuh, "Questioned and focussed subjects and objects in Bade/Ngizim"

Pascal Boyeldieu, "Questions portant sur la classification du laal (Tchad)"

Thursday, October 4

Morning

Jacqueline Thomas, "La distinction entre emprunts et héritage de la langue-mère avec application au parler des Pygmées aka"

Jean-Pierre Caprile, "Quelques rapprochements phonétiques et lexicaux entre le toumak et quelques autres langues tchadiques orientales"

Barbara Frank, "Diskrepanz zwischen Kultur- und Sprachzugehörigkeit der Kulere im nigerianischen Mittelgürtel"

V. de Colombel, "Rapport sur des recentes recherches dan le domaine des langues tchadiques au Nord-Cameroun"

Kiyoshi Shimizu, "Lexical loans from Jarawan-Bantu into the South Bauchi group of Chadic languages"

Afternoon

Daniel Barreteau and Herrmann Jungraithmayr, "Le verbe en sibine"

Shuji Matsushita, "CLUSTER: a program package for cluster analysis of the Chadic languages" (presented in absentia by Kiyoshi Shimizu)

*Conference announcement:*

## FIRST NILO-SAHARAN LINGUISTICS COLLOQUIUM

The *First Nilo-Saharan Linguistics Colloquium* will be held at Leiden, September 8-10, 1980. A special symposium, "Nilotic: Language and History", will be held on the first day. Interested persons who do not receive the *Nilo-Saharan Newsletter* are requested to contact one of the organizers.

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*Studies in African Linguistics*
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# PUBLICATIONS RECEIVED

Kaye, Alan S. ***A Dictionary of Nigerian Arabic.*** Seminar Papers Series, No. 45. Fullerton, CA: Department of Linguistics, California State University, Fullerton, CA 92634, 1979. (no price listed)

An English-Arabic dictionary of the Arabic dialect usually called Shuwa Arabic spoken in northeastern Nigeria, northern Cameroon, and western Chad.

Timyan, Judith. ***n wan yo: cours de baoulé.*** Communication audio-visuelle, no. 3. Abidjan: Université d'Abidjan, 1978. (no price listed)

(write Institut de Linguistique Appliquée, Université d'Abidjan, B.P. V 34 Abidjan, IVORY COAST)

Introductory course in Baoule, organized into eight large units plus Baoule-French and French-Baoule word lists. Each unit briefly outlines several points of grammar, the remainder of the unit being a series of short conversation-style exercises on this grammar. Tone is not marked on individual words, but tone is described, and, where relevant, tonal diagrams are given. The book is richly illustrated with what may be the best drawings in any text on an African language. Tapes are available.

***Cahiers ivoiriens de recherche linguistique***, No. 5, April 1979. Abidjan: Institut de Linguistique Appliquée.

Contents:

*A Multilingual Society: English and Afrikaans amongst Blacks in the RSA*. Report No. TLK/L-7, South African Human Sciences Research Council. Pretoria, 1979. R1,55.

(write Human Sciences Research Council, Private Bag X41, Pretoria 0001, REPUBLIC OF SOUTH AFRICA)

Report of a survey of 3653 Blacks done in 1975 to determine proficiency in and attitudes toward Afrikaans and English. "The best possible explanation is that English is more a language of prestige for the Black population, whereas Afrikaans has more pragmatic value" (p. iv).

## OTHER RECENT PUBLICATIONS

*West African Language Data Sheets Volume I*, edited by M.E. Kropp Dakubu. Accra: West African Linguistic Society, 1977. (Prices: US $6.00, £3.00, Fr(French) 25,9 for WALS members; US $10.00, £5.00, Fr(French) 43,2 for others. Please add for second class air mail postage US $2.35, £1.20, Fr(French) 10,2 for WALS members; US $3.50 (UK and Europe)/$4.50 (North America), £1.50, Fr(French) 15,7)

(write to The Secretary-Treasurer, West African Linguistic Society, c/o Dr. M.E. Kropp Dakubu, Department of Linguistics, University of Ghana, P.O. Box 61, Legon, Accra, GHANA)

The first volume to be produced through the Language Data Sheets Project of the West African Linguistic Society is now available. This valuable research tool contains basic demographic data, linguistic analyses and word and phrase lists from authoritative contributors for forty-two languages, many of them never before recorded in such detail. Each article follows a standardized plan to facilitate comparison, and is keyed in both English and French. The work is fully indexed. The languages included in Volume I are: Abua, Adioukrou, Angas, Anyi, Bamileke, Bassari, Bekwarra, Bisa, Buem, Dagaare, Dagbani, Dangme, Dghwede, Diola, Doohwaayããyo, Efik, Efutu, Ekpeye, Eloyi, Engenni, Ewe, Fali, Fula, Ga Gechode, Genyanga, Godié, Igbirra, Igede, Ịzọ́n, Kalabari, Kasem, Kilba, Kissi, Kofyar, KoHumono, Konkomba, Krachi, Krim, Kruman, Kusal.

From *Indiana University African Studies*:

Roger B. Beck (ed.), *A Bibliography of Africana in the Institute for Sex Research*, 1979. 134 pp. $5.00 plus postage.

L. Adele Jinadu (ed.), "Structure and choice in African politics." Tenth Annual Hans Wolff Memorial Lecture, 1979. 1979. 24 pp. $2.50 plus postage.

Ousmane Sembene, "Man is culture." Sixth Annual Hans Wolff Memorial Lecture, 1975. 1979. 24 pp. $2.50 plus postage.

Inquiries and orders for these and other IU African Studies publications should be directed to Susan Myers, African Studies Program, IMU-661-666, Indiana University, Bloomington, Indiana 47401.

New journal from *University of Texas Press*:

*Language Problems and Language Planning* (beginning 1980).

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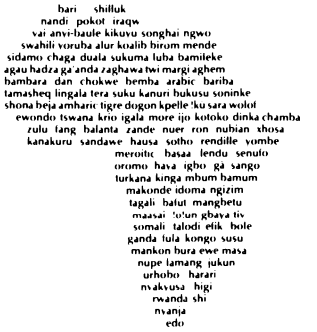


Editor: PAUL NEWMAN

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